

Where the Wild Things Roam:
A Semiotic Study of Wildlife in the Rocky Mountain Arsenal National Wildlife Refuge

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Abstract

This thesis researches the significance of wildlife in the Rocky Mountain Arsenal National Wildlife Refuge, which used to be an industrial site beginning in World War II. This study analyzes wildlife using a semiotic approach and various methods. These methods include ten interviews, visits to the Arsenal, interpretation of archive materials from the University of Colorado Boulder's library, and analysis of previous scholarly work carried in landscapes that used to have a military presence. Based on the collected archival materials, I argue in Chapter Three that certain animals act as semiotic signs, such as the ducks and the bald eagle. After providing a historical overview of the Arsenal, in Chapter Four I analyze the current day conditions of the site by concentrating in the interactions between visitors and wildlife, in order to determine the type of relationships that are being emphasized. Finally, I apply the notion of hyperreality to support the idea that the Arsenal has become a constructed site where humans can experience an idealized version of wildlife that is framed by educational tours and experiences. This last notion of a fabricated space eventually determines how we interpret the site, while shaping the legacy of the Arsenal.

Chapter One: Introduction

Background

Nestled among burgeoning suburban developments with the Denver skyline backdrop, the 15,000-acres that constitute the Rocky Mountain Arsenal National Wildlife Refuge (or the Arsenal) currently maintains the title of being the largest urban wildlife refuge in the country. To the enjoyment of wildlife enthusiasts and curious visitors, one does not need to travel far to leave the bustling city and discover the iconic animals of the prairie ecosystem along Colorado's Front Range. The American bison (*Bison bison*), Ferruginous hawk (*Buteo regalis*), burrowing owl (*Athene cunicularia*), black-footed ferret (*Mustela nigripes*), black-tailed prairie dog (*Cynomys ludovicianus*), and white-tailed deer (*Odocoileus virginianus*) are just some of the animals found among the vast tall grasses and cottonwood trees. It may come as a surprise then that what is now a wildlife refuge that both locals and out-of-state visitors enjoy used to be a site of intensive wartime and pesticide manufacturing that produced dangerous and harmful waste.

Only 43 years ago, *The Denver Post* described the Arsenal as being one of “the most polluted pieces of ground in America” (Purdy 1995, 1). The U.S. Army seized 20,000 acres of farmland for military operations in 1942, rationalizing that the land offered various strategic benefits such as being far from foreign threats, close to railroads, and near the growing city of Denver, which provided labor and resources. The thousands of “empty” land acres would provide an adequate buffer zone for the operations that would occur at the center, or core, of the site (Edson et al. 2011). The Army established and operated two main plants—the South and North Plants—along with other infrastructures and buildings, a majority of which would be demolished in the future remediation stage (Coady, Jones, and Giesy 2001). During the World

War II and until the late 1960s, the Army manufactured and stored various chemical weapons for projectiles and rockets on site, such as blister agents (e.g., mustard gas), incendiary bombs (e.g., napalm), nerve agents (e.g. Sarin), and pulmonary agents (e.g. phosgene) (Edson et al. 2011). Although the majority of weapons were stockpiled at the Arsenal (Edson et al. 2011), some of the weapons were deployed, such as the napalm bombs dropped on Japan in 1945 (Salcido 2014). Due to the excessive production of weapons on site, the Arsenal also became a site for dismantling and disposing ‘obsolete’ weaponry.

From 1946 to 1982, the government found a new purpose for the Arsenal by leasing portions of its facilities to private industries producing pesticides, most notably the Shell Chemical Company, which is a division of the Shell Oil Company (also known as Shell) (Coady, Jones, and Giesy 2001). During this period, the Arsenal was the site for the mass production of dieldrin, chlordane, aldrin, and other organochlorine compounds, including all of their just-as-toxic byproducts (Coady, Jones, and Giesy 2001). Although the Army and Shell stopped manufacturing in 1969 and 1982 respectively, the products and byproducts that resulted from manufacturing were disposed of on site in natural depressions and trenches, resulting in the so-called ‘witches brew’ from years of pesticide and chemical munitions production (Edson et al. 2011).

The manufacturing and waste disposal practices during these times were minimal, as intensive use of these facilities resulted in extensive water, soil, and building contamination. In the fervor of developmental progression and technological global domination, especially during World War II and the Cold War era in the United States, many of the human-made chemicals that we now consider deadly and toxic were poorly misunderstood or were blatantly disregarded. On top of this, the time constraints that implementation of safety would put on the efficiency of

industry made contamination violations even more common. Areas of waste disposal released harmful chemicals in the surrounding groundwater, air, soil, and natural water formations (Salcido 2014). It is estimated that 136,000 tons of contaminants were released by Shell alone, not including the 24,000 tons that the Army produced (Edson et. al 2011).

As the general public in the 1970s became more aware and concerned about the lands tainted from wartime activities, such as the toxic waste dumps of Valley of the Drums and Love Canal, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) created a “National Priorities List” of highly toxic and threatening landscapes that were prioritized for cleanup (Salcido 2014). Defined as “Superfund sites,” these landscapes constitute some of the worst polluted areas in the United States. The Arsenal was placed under the National Priorities List in 1987, and its remediation cost around 2.1 billion dollars (Havlick 2018). The site was officially designated as a refuge under the Rocky Mountain Arsenal National Wildlife Refuge Act of 1992 with the signature of President George Bush. According to the Environmental Protection Agency (EPA), which regulates Superfund sites, the remedy employed in the Arsenal included “boundary groundwater containment and treatment systems and off-post intercept and treatment system; long-term surface and groundwater monitoring; [... and the prevention of] human and wildlife contact with physical hazards such as unexploded ordnance” (United States Environmental Protection Agency n.d.). Landfills were created on site with protective caps and seals that now house contaminated soil and debris. The Arsenal’s surface cleanup ended in 2010, and in the same year the U.S. Fish and Wildlife Service (USFWS), nestled under the U.S. Department of Interior (DOI), acquired the final acres of land for the refuge. However, despite the supposed victories of remediation and the fact that the Arsenal underwent one of the most expensive remediation efforts in the country, media sources have

picked up on debates about the safety aspects of the Arsenal, including concerns about detecting lewisite, a blistering agent, in 2007 and 2008 (Krupar 2013), as well as water management and groundwater concerns (Mitchell 2019). Thus, the Arsenal not only exhibits a rich diversity of wildlife and plant communities, but also a human past that is just as complex.

Purpose

Through its history, the Arsenal has undergone drastic changes, resulting in the various ways the public has experienced and interpreted this site. While it is clear that humans played a pivotal role in the fate of the Arsenal, the wildlife on the site have been, and continue to be, significant as well. From being used in ecotoxicology studies to being photographed in tours, the wildlife contributes to the cultural and social narrative of the Arsenal that we know today. This thesis aims to focus on the power that wildlife carries in the Arsenal, which has ties to both the politics and history of the site, and the far-reaching consequences of such power. What is the social significance of the wildlife in this Superfund site, and how does this significance shape the relationships between humans and animals? Additionally, how have these human generated signs of wildlife evolved over time as the Arsenal transitioned from being a military site to a wildlife sanctuary? And what relationships exist between humans and animals during these changes? And finally, what are the current consequences of the cultural role of wildlife and human interactions? This study shows how signs have been created in the Arsenal and continue to be used in the present day, what meanings people attribute to these signs, and how these signs work together to create a coherent narrative.

In order to answer these questions, I applied concepts and terminology of semiotic analysis, following particularly the semiotic theory of hyperreality, as well as Ferdinand de

Saussure's overall theory of semiotics. Additionally, in order to structure my observations, I relied on anthropological theory related to the use of signs in culture by adopting concepts from Clifford Geertz. I argue that animal bodies have been imbued with meaning and significance that influence the way we interact not necessarily with the actual animals, but rather with their representations, which affects how we view the landscape itself.

Methods

In this thesis, I performed qualitative research, specifically archive and ethnographic research, by analyzing a wide array of what semiotics calls 'texts,' or objects and physical texts from which one can create meaning, in order to perceive how wildlife acts as signs. The main texts come from field notes taken at the site from tour activities provided to visitors, ten semi-structured interviews, and archival materials. Despite the different types of data that I collected, the main approach of this thesis is to conduct a hybrid study in which I use thematic analysis with an application of semiotic and anthropological theory through ethnographic and archive research. This approach incorporates applied ethnography to semiotics, which does not have a certain way of collecting data. Semiotic analysis is flexible, and does not follow one standardized approach for identifying and assorting signs, although there are techniques that can be used (Curtis and Curtis 2011). Some of these techniques are similar to anthropological methods, such as interviewing and field work, but semiotic scholars can also incorporate "non-interactive" forms as well, such as searching through primary sources (Curtis and Curtis 2011). I decided to use thematic analysis as a template for collecting and organizing the data listed above, while analyzing the data through basic semiotic principles. Through thematic analysis, I was able to seek and find relationships and analyze these relationships by comparing and contrasting

information and creating a coding schema which I applied to my gathered materials. Thematic analysis works alongside semiotics because it essentially looks for the same, or similar, themes throughout different sources of data. These themes lead to finding meanings, which can then be analyzed through semiotics. Coding is integral to this research because it helps manage large volumes of data by summarizing the major findings.

By conducting the interviews, I spoke to individuals that have an awareness of the Arsenal. During my preliminary studies, it came to my attention that the history of the Arsenal remains obscure to many locals in Colorado, as the Arsenal contamination legacy has faded over time. For this reason, I did not interview random public participants from Colorado or visitors of the Arsenal, and rather focused my attention on local experts. Specifically, I decided to interview experts in conservation or who have a decent understanding of the site—such as USFWS employees and Colorado universities’ professors—and advocacy citizen group members who have been involved in the Arsenal or Rocky Flats—such as the Rocky Mountain Peace and Justice Center and Environmental Information Network. These different points of view helped me to achieve a professional understanding about how members belonging to different groups perceive the landscape and its wildlife. The interviewees included three employees who previously worked at the Arsenal; one employee of City of Boulder Open Space and Mountain Parks; two members of advocacy groups and four professors specialized in geography, environmental anthropology, physics or journalism. For the purpose of this study, I use pseudonyms for each participant.

In addition to the interviews, the study analyzed the wildlife-oriented free events that the Arsenal offers to the public. These events take place throughout the entire year, and the analysis is based upon observation notes taken while attending these programs. In total, I was able to be

present at eight events. These observations helped me to obtain a better understanding about the information provided to the public and the official narrative fabricated at the site. It is important to note that, although this study explores how knowledge is being produced around the Arsenal landscape for the public, it only focuses on one receiving end of this rapport: the professionals' point of view. In other words, this research emphasizes how information is being displayed while trying to shed light on how the wildlife and visitor relationship is constructed by the agencies involved.

The archival materials mainly consist of primary sources about the Arsenal retrieved from the University of Colorado Boulder's archive. The benefits of doing archival research is that this source of data reflects cultural processes through time (Bernard 2006). Archive research is suited for studying data that is "too politically 'hot'" (Bernard 2006, 448), which was the Arsenal's situation in the past. Nonetheless, just as with any data, there comes a set of biases and errors that one must consider before analyzing these texts too critically. Newspapers, in this case mainly *The Denver Post*, and pieces of propaganda can be loaded with both institutional and individual bias. In addition, my main source of archival materials comes from Boulder's Norlin Library, and consequently the archives only provide a snippet of the whole picture. Due to the specificity of the project, there was no way to refine my search to just "wildlife;" thus, I searched through boxes generally labeled as "The Rocky Mountain Arsenal," including the box collections of people involved in the Arsenal. From all the collections that I examined, this thesis studied the *Adrienne Anderson Collection* (Box 2), *Patricia Schroeder Papers* (Box 60), *Hank Brown Papers* (Box 18), and *John C. Cobb Papers* (box 35). Many of the archive's collections used in this study originated from individuals who not only showed interest in the Arsenal, but also in other contaminated sites, such as Rocky Flats. I consider archives a valuable asset to my

research because I conceptualize how the subjectivity and interpretation of the Arsenal in the past have influenced contemporary understandings.

Past Scholarly Work

Before delving into the study of wildlife representation, it is essential to examine the current academic standing of militarized landscapes. I employ the term “militarized landscapes” (Havlick 2018, 4) as areas that once had, or still have, military presence under the form of bases, training grounds, or military industry. Most of the scholarly work that covers places such as the Arsenal comes from historians, geographers, and scholars in different academic fields. Sites such as the Arsenal have garnered the particular attention of many researchers due to the prevalence of militarized landscapes throughout the United States and the world. Although the historical context of the Arsenal may sound alarming, perplexing, and contradictory, it is not as exceptional as one might think.

The conversion of military prevalent areas during World War II and the Cold War to the wildlife refuges that we know today has occurred at a global and national scale. Colorado Springs professor David G. Havlick, who has extensively noted the relationships and the contradictions that exist between ecological restoration, conservation goals, and military presence throughout the world, has defined these lands as military-to-wildlife sites or M2W sites (Havlick 2018). Places such as the demilitarized zone in Korea (Coates 2014); the Green Belt in Germany (Pieck 2019); the wildlife refuge in Puerto Rico (Davis, Hayes-Conroy, and Jones 2007); and the Salisbury Plain nearby Britain’s military training grounds (Coates et al. 2011) are just some of the many sites in which militarism, nature, and wildlife are deeply entangled, creating proliferative and harmful relationships. These relationships are riddled with

contradictions, the most significant being the fact that the military has recently taken the position of being an environmental steward (Coates et al. 2011) when it is one of the largest contributors to national contamination and is notoriously known for making weapons of extreme destructive capacity (Smith, Turner, and Rusch 2002). While M2W site conversions have raised suspicions from both scholars (Wills 2001) and the public (Smith, Turner, and Rusch 2002), there is the indisputable fact that these militarized landscapes do serve as places for nature and wildlife to exist. However, the quality of the environmental conditions at these sites still remains a matter of debate.

Many of these sites exhibit what some call the ‘Brownfield explanation’ for their wildlife conversion (Havlick 2007), where these lands have been so heavily contaminated that they are deemed unsuitable for human habitation and instead serve a safer and practical use as wildlife refuges. Nonetheless, wildlife not only continues to inhabit these landscapes, but in some cases also begins to have a larger population within the confinements of the militarized zones than outside these zones (Coates et al. 2011; Cohn 1999). Relative to all of the United States federal agencies, the Department of Defense (DOD) has a disproportionate amount of endangered species within their owned land, a number which matches that of the USDA Forest Service (Stein, Scott, and Benton 2008). This phenomena perfectly resembles the notion of an ‘involuntary park,’ according to which areas devoid of humans have unintentionally gone back to their wild roots and are overrun by wilderness (Coates 2014). Without any human presence and harmful anthropogenic actions, such as development and agriculture, nature arguably finds relief from the constant battle with humans over limited space. The Arsenal is extraordinary in this regard because it is a vast prairie landscape situated right next to the ever-growing metropolis that is Denver.

While militarized landscapes can ultimately harbor some of the worst contaminants such as plutonium and nerve gas, the unsettling reality is that the lack of human presence enables wildlife to survive better within these contaminated areas than in other areas. While people can still influence the quality of these landscapes, these sites are still freed from the continuous stress brought by human actions. This implication brings up a rather concerning realization about the impact modern humans have on wildlife. A few scholars have discussed this paradox. For instance, the renowned British environmentalist James Lovelock, who created the Gaia hypothesis, states: “I have wondered if the small volumes of nuclear waste from power production should be stored in tropical forests and other habitats in need of a reliable guardian against their destruction by greedy developers” (Lovelock 2001; Coates 2014, 507).

While these notions might seem radical, it is not hard to come to these conclusions when looking at the various scenarios in which wildlife ‘thrives’ in areas previously used for military operations or areas severely contaminated. The repopulation of wolves after the Chernobyl nuclear plant accident (1986) is a clear example of how wildlife can continue to survive in damaged landscapes. Another example of this paradox is found in Fort McCoy, Wisconsin, where the endangered Karner blue butterfly has prospered due to disturbances caused by military maneuver trainings (Smith, Turner, and Rusch 2002). Conservationists collaborating with the military sector learned that these military activities originated frequent disturbances that increased the density of lupine, a disturbance-dependent perennial forb that is required for the survival of Karner blue butterfly larvae. Oddly enough, the presence of so many endangered species in militarized sites does not show the apparent indications of polluted landscapes as it would be expected, but rather of emerging healthy landscapes that prosper.

This paradox creates a perfect opportunity for the implementation of conservation strategies, such as what some scholars call “opportunistic conservation” (Havlick 2018, 18). These lands provide an opportunity to devote areas purely to wildlife and nature management. While again it is odd to view agencies of conservation, specifically the USFWS, and the military working together, they share some similarities that make these relationships possible. Both have the mission of protecting “America the Beautiful” (Wills 2001, 457), as they control and manage certain territories. More control and regulations are considered to be a last attempt that conservationists make to protect our lands, a discourse which shares narrative elements with the military (Meierotto 2014). This is especially true for wildlife refuges, as their primary objective is the protection of wildlife, fish, and plant resources (Meierotto 2014). Despite their stark differences, both the military and the USFWS strive to protect life, whether the unit of interest is wildlife or humans, through intensive strategies and management.

For instance, in Cabeza Prieta, which is near the U.S.-Mexico border, there exists a wildlife refuge that has a long historical military presence. Conservation managers and military personnel work together in various projects, especially with the Sonoran pronghorn, an endangered subspecies of pronghorn. The military shows support towards the preservation of these pronghorn through funding and additional resources, even moving or suspending military training until these animals move out of their lands. Meanwhile, the USFWS, despite showing some hesitations, has allowed the military to conduct activities in order to reduce the increasing border crossing of undocumented individuals, as it supposedly hinders the efficiency of the refuge (Meierotto 2014). While this case remains markedly different in comparison to other American M2W sites, it demonstrates that ultimately military and conservation can co-exist in a “symbiotic relationship”(Meierotto 2014, 637). It shows what some scholars call the “win-win-

win” situation of these conversions, as the DOD “streamlines its assets with base closures, the public receives open space amenities and new sites for environmental education or recreation, and fish and wildlife populations gain additional habitat reserves” (Havlick 2007, 152). As one article argues, it would be more practical to look towards the future of these lands as having the potential to benefit the local communities rather than leaving them as they are (Greenberg et al. 1997), arguing that “popular images [of weapons sites] do not match reality” (740); if these ‘pristine nature’ sites do not resemble our expectations of a contaminated wasteland, why shouldn’t we take this opportunity?

The cooperation between conservation and the military in these landscapes bring to light a culture’s way of perceiving and understanding what is nature, which can finally lead to ethical issues. Although it is obvious that nature, wildlife, and contamination appear to us under a physical form, they also exist in a ‘discursive form’ that is prevalent in militarized landscapes (Davis 2007). In other words, our understanding is based both on what we see physically and what we are told through social constructions. The fact that there is an inherent contradiction that wildlife inhabits contaminated lands reflects our notions of what we believe to be “nature” and “human,” and the need for a division between the two. As noted before, the existence of wildlife is at conflict with that of humans, and this leads us to believe that we are completely separate from what is considered “nature.” Thus, a land viewed as pristine will arguably be seen as a land neither touched nor tainted from anthropogenic actions.

This can be seen in Vieques Island, Puerto Rico, a military base and an area for test dropping bombs, which caused the mass dispossession of the people living on the land. Two thirds of the Vieques Island in Puerto Rico transitioned from being a military base to a wildlife refuge that is nowadays frequented by international tourists and visitors. While the residents

show logical resentment towards both the military and the USFWS, tourists and visitors praise the refuge and the military for protecting the land (Davis, Hayes-Conroy, and Jones 2007). These generated and juxtaposing interpretations of the land resulted from various factors, such the degree of visibility of nature versus contamination, the individual's prior awareness of the military's history, and the outlook that the local media uses to represent these landscapes (Davis, Hayes-Conroy, and Jones 2007). The visitors, who have either very little or no previous knowledge of the military's involvement on the site, only see the beautiful beaches and wildlife. Contamination is seen as 'cultural,' as a sign of previous human history in the landscape and due to its invisibility, visitors seldom question the site. Partially, this ignorance is a natural reaction to the expectation that nature will not prosper in a space of contamination, something that is essentially human.

Meanwhile, the residents have an obvious historical awareness through personal experience about the site which does not depend on visual cues, especially because there are not that many. Contamination remains invisible most of the time to the human eye, and most of the previous infrastructures were torn down or overrun with vegetation. While this case has an additional layer of colonialism and gentrification, it is indicative of many other sites in the United States. As time goes on, people will be bound to forget the history of the site unless they are provided with the appropriate cues, both visual and textual. If there are only signs that we deem "natural," like vegetation or wildlife, we tend to forget that nature and social histories are deeply embedded in one another (Pieck 2019).

This raises the idea of narrative construction and narrative erasure on militarized landscapes, which is the ultimate consequence of converting these sites into wildlife refuges that can affect local communities. While this may hold some truth, as now the DOD provides some

funds and resources to conservation management (Meierotto 2014), it is important to note that these narratives can also cause negative consequences. In the past, this type of discourse has strengthened the legacy of the military as a protector of U.S. land, despite showing no interest in protecting neither nature nor wildlife during World War II and the Cold War. Additionally, this narrative has relieved government agencies from the financial burdens of entirely cleaning up the contamination for human habitation (Davis, Hayes-Conroy, and Jones 2007). Citizens in Vieques, Puerto Rico, perceive the involvement of the USFWS as “a way of preserving the contamination” (Davis, Hayes-Conroy, and Jones 2007, 176), as the thoroughness of the clean-up depends on the future use of the site. In this case, due to the creation of the refuge, the cleaning standards were lower than the standards set in place for human residency.

Another way that these conversions potentially hurt communities is by the selective omission of memories and social history in environmental narratives, which will tend to focus on wildlife and nature while forgetting the actual people involved. Again, due to the idea that nature and humans are separate, oftentimes a narrative is chosen over the ones involving local communities, the military, and individual memories, despite the fact that these narratives are heavily intertwined (Coates 2014). Conservationists and the military take the role of architects of these sites’ narratives (O’Brien 2007), as eventually it is not only militarism which affects nature but also notions of nature that inform militarism (Davis 2007). They must contend with these complex layers and have power over what will be remembered and forgotten. If the proper balance is not found and only one narrative focuses on wildlife and nature, then we lose the chance of seeing “the relationship between nature and history” (Pieck 2019, 197). There is the concern that the government’s emphasis on restoring the landscape and reverting the land to its previous natural state without the influence of humans— despite the good intentions by

conservationists— erases the history of M2W sites. Thus, the stories that we tell ourselves about these landscapes will have repercussions not only on what will be remembered, but also on our present and future actions (Havlick 2018).

Although most of the scholarly work on M2W sites has been approached through concerns about the landscape, my study also builds on Shiloh Krupar's research, a geographer and Provost's Distinguished Associate Professor at Georgetown University. In Krupar's book *Hot Spotter's Report: Military Fables of Toxic Waste*, she applies Foucault's concept of biopolitics to the animals in the Arsenal. This scholar considers the "'return to nature' brought on by military-to-wildlife conversions to be spectacle, an environmental project and arrangement of truth that administers military remains as wilderness" (Krupar 2013, 28). She specifically focuses on the bald eagle and the bison as signs that depict morality, nature, purity and notions of colonialism, that assist in the creation story of the Arsenal (Krupar 2013). Through her study, she looks at how "the preservation of nature can simultaneously involve economic efficiencies, domestication, even extermination, under signs of the management of 'life'" (Krupar 2013, 30). I delve deeper into her ideas and see how these signs implicate humans through various relationships by applying semiotic theory.

Chapter layout

This literature review shows that military landscapes are complex and saturated with ecological 'truths' but also with subjectivity and interpretations. M2W spaces have been shaped by various factors such as physical 'natural' change, politics, economics and social priorities, and they are in a continuous process of change (Havlick 2018). In this way, wildlife plays a fundamental role since in addition to 'being present,' the wild animals are imbued with a range

of beliefs, meanings, and attributes as a consequence of the involvement of agencies such as the DOD and USFWS.

Chapter Two presents a theoretical review of semiotics as a way to approach and understand the relationship between wildlife and people. I provide a brief introduction to how I interpret wildlife through a semiotic framework. In Chapter Three and Chapter Four, I apply the concepts introduced in my first two chapters to the collected data. Chapter Three focuses on a diachronic analysis of archival materials. This analysis explores the axis of succession, or the evolution of the wildlife sign over time, starting in the 1940s when the military had full control of the land until the conception of the refuge in the 1990s. Chapter Four explores the current day use of wildlife in the Arsenal as a hyperreal space by looking at the different ways in which they are represented through the analysis of interviews and field notes. And finally, Chapter Five concludes the study, as I discuss the significance of wildlife within militarized landscapes.

Chapter Two: Theory

Overview

We are constantly exposed to wildlife in ways that may be unconscious, such as images displayed on different mediums, corporate logos, iconic mascots, cartoon representations, and objects of everyday use (Alagona 2013). Wildlife is incorporated in the social tapestry of Western society beyond simply fulfilling beneficiary ecosystem services. Indeed, animals become a proxy that reflects our own identity, since they are a “chink in the culture’s armour [...] or a means of getting around the culture’s naturalization of itself” (Baker 2001, 8). Animals also share an inevitable affinity with humans, although not necessarily to their benefit. Climate change and habitat fragmentation offer a taste of the consequences of human activities, but there are plenty of other concerns that scientists face in order to stop the global course of species’ extinction.

This chapter provides an overview of Ferdinand de Saussure’s main semiotic principles and Jean Baudrillard and Umberto Eco’s notion of hyperreality. I apply these theorists’ ideas in order to interpret the meanings of wildlife. Drawing inspiration from Clifford Geertz’s studies, this chapter also explores the implications and applications of semiotic analysis to the anthropological field. To understand the role of animals in the narratives embraced by the Arsenal, it is important to take a step back and note how anthropology and semiotics are closely tied together.

Semiotics and Anthropology

Semiotics is the study of signs which can appear under different forms, such as a physical objects, sounds, images, gestures, phrases or words (Chandler 2007). Because anything from our surroundings can be essentially a sign, it is important to note that something can only qualify as a sign when it makes reference to something other than itself (Chandler 2007; Berger 2005).

Semiotics focuses primarily on how these signs are created, imbued with social meaning, and communicated, which inform researchers about how reality is created (Chandler 2007). Although in contemporary scholarship semiotics is applied to various fields, genres, mediums, and texts, the founding principles of semiotics stem from linguistics, partially due to one of the founders of semiotics, Ferdinand de Saussure (Chandler 2007). While Saussure's principles are rooted in linguistics, this current study applies his theoretical concepts to the construction of social and cultural discourses.

One of Saussure's main arguments is that language itself goes beyond the mere connection of a term and a thing, as it consists of the creation and usage of signs that are 'purely psychological' (Saussure 1959). He argues that there is nothing inherent in words that we use to define a certain concept or object, although these associations are so embedded within our common-sense that they seem completely rational (Saussure 1959). For example, the word tree instantly conjures the image of a tree in the reader's mind, but there is "nothing tree-like about the word 'tree'" (Chandler 2018, 24). The term sign includes both the word and the concept, which Saussure names the signifier and the signified (Saussure 1959). While the signifier is the ultimate form of the sign (such as the word "tree"), the signified is the concept to which the sign is alluding (such as the image of a tree) (Chandler 2007). The connection between these two concepts is arbitrary because the signifier "has no natural connection with the signified" (Saussure 1959, 69). Like language itself, signs are not solely construed by the individual, but

rather take life within the community and society where they are used (Saussure 1959). The meaning of a sign originates from an individual's interpretation and a society's conventions (Hodge and Kress 1988). Paradoxically, Saussure argues that there are elements of mutability and immutability within a sign due to its social aspects: "As [language] is a product of both the social force and time, no one can change anything in it, and on the other hand, the arbitrariness of its signs theoretically entails the freedom of establishing just any relationship between phonetic substance and ideas" (Saussure 1959, 76).

Another point in Saussure's theory shows how these signs work within a system of signs; that is, no sign exists in isolation. The significance that originates from the combination of the signifier and signified depends upon a sign system of similarities and oppositions (Chandler 2018). The oppositions between signs distinguish one sign from the other and give the sign its identity: "[A]s in any semiological system, whatever distinguishes one sign from the others constitutes it. Difference makes character just as it makes value and the unit" (Saussure 1959, 121). A clear example would be a traffic light, as the color red signifies that a vehicle must stop only because it is confined within a system in which the color green implies the opposite, to go (Chandler 2018).

Saussure's ideas based on immaterial linguistic signs have been slightly modified by contemporary semiotic scholars in order to include signifiers with a physical or material form (Chandler 2007). Nonetheless, Saussure's semiotic theory provides useful insights for the social sciences, as his theory implies that language does not only mirror a certain reality, but rather it actually constructs it (Chandler 2018). In a society, signs depend on collective context, specifically on cultural conventions which we take for granted and which are considered to be

common sense (Chandler 2018). Essentially, humans create meaning through the use and interpretations of signs (Chandler 2007).

Anthropology and semiotics attempt to understand the creation of meaning through signs applied by a given society. As Clifford Geertz argues in *The Interpretation of Culture*, the “concept of culture [...] is essentially a semiotic one” (Geertz 1973, 5). Culture does not exist outside of the individual, but rather manifests through human actions and behaviors that employ different rituals and signs with attached meanings (Geertz 1973). We gain access to these signs not only by looking at a sign and determining what it is saying, but by perceiving signs and symbols in action, as “the flow of behavior [...] is where] cultural forms find articulation” (Geertz 1973, 17). According to this interpretation, “man is an animal suspended in webs of significance he himself has spun” (Geertz 1973, 5). Ethnography attempts to unravel these complex structures of signification in order to get past the ‘thin description,’ or the tangible and physical form of some objects or actions, to arrive at the ‘thick description,’ that is, the explanation of the meanings that are being created and conveyed (Geertz 1973). This process echoes Saussure’s theories, since there are two components of a sign: the physical form (the thin description, or, the signifier) and the deeper meaning (the thick description, or, the signified). As Geertz notes, culture is the well from which individuals draw inspiration and it is reflected in our institutions, organizations, social actions, and surroundings (Geertz 1973). Saussure, and semioticians in general, argue that anything can become a sign, as long as it is being conceptualized by individuals.

Wildlife, and animals in general, can easily become instruments of the human imagination. While the creation of a human identity is complex, a part of this self-identification relies upon comparing and contrasting oneself to things that are not related to the individual or

group (Galaty 2014). Animals have often become these very objects of comparison in order to gain a greater understanding of the self and they are frequently incorporated in social acts and rituals. Geertz's essay "Deep Play: Notes on the Balinese Cockfight" shows the importance of animal positioning within the human conceptualization of the world, and the ways in which animal and human relationships exist. While researching in Bali in 1950s, Geertz realized the importance of illegal cockfights in various communities. Rather than being a minor pastime, the cockfights "brings to imaginative realization a dimension of Balinese experience normally well-obscured from view" (Geertz 1974, 24). These cockerels resembled different aspects of Balinese culture associated with masculinity, hierarchical status, blood sacrifice, and mass reactions (Geertz 1974). Geertz (1974) raises the fundamental point that these "cultural forms can be treated as texts" (27), as the cockfight is ultimately "a simulation of the social matrix" (18).

It is often the relationships that humans have with animals that define both individuals and the specific animal. Animals act as the perfect medium to explain both the natural world and our own existence (Galaty 2014). Despite their apparent differences, we also see similarities which we use to construct our own reality according to our own specific culture.

Linguistic Concepts in Semiotics

Once animals become signs, they can also illustrate other semiotic concepts. Semiotics uses linguistic concepts as a framework to understand how meaning is being formed (Berger 2005). The general public is familiar with some of these semiotic ideas, such as metaphors and symbols. However, there are other ideas that may require an explanation, such as isotopy, intertextuality, and synecdoche. Isotopy can be explained as the repetition of some element in the text or the content itself (Rossolatos 2013). Meanwhile, intertextuality occurs when a text acts as

a material source for another text, whether by evoking texts, themes, characters, or plots (Berger 2005). Synecdoche refers to a part of an object or idea that stands for the entire thing under consideration.

In addition to all these terms, linguistics focuses on the structure of language itself, and on the principles that govern that structure. Considering that the association between signifier and signified is based upon convention, there must be certain structures in place for the reader to internalize and learn the meaning; in semiotics, these structures are called codes (Berger 2005). Essentially, codes are “highly complex patterns of associations that all members of a given society and culture learn” (Berger 2005, 30) which influence the way people interpret a certain sign. Our experiences and worldview are filtered through these rules and regulations, and we can see these codes manifested in aspects such as our ideologies, rituals, and institutions (Berger 2005).

Hyperreality

As mentioned before, animals can easily become ingrained within the social tapestry of ordinary life and the imaginative process of human sign making. In many cases, animals can provide a means for constructing certain realities, as well as a means for making sense of a given surrounding. Hyperreality is an outcome of such creative processes. In contemporary scholarship, hyperreality is defined as the moment when an artificially produced object or event replaces the original in question due to cultural inclinations (Berger 2005). One of the founders of hyperreality, Umberto Eco, applies this concept to the fantastical landscapes that are created throughout America and that revolve around the consumption of both the present and the past (Eco 1986). Jean Baudrillard, another founder of this theory, emphasizes that hyperreality is

constructed by simulations, which are “the generation of models of a real without origin or reality” (Baudrillard 1994, 1). These simulations appear to be real, and as such they threaten “the difference between the ‘true’ and the ‘false’” (Baudrillard 1994, 3).

Baudrillard argues that once these fabricated simulations of reality successfully take over, the simulacra, or artificial copies, can then become dominant (Baudrillard 1994). When an individual cannot distinguish between the real and the fake, one enters the realm of hyperreality, as it acts as “a programmatic, metastable, perfectly descriptive machine that offers all the signs of the real and short-circuits all its vicissitudes” (Baudrillard 1994, 2). In America, a “country obsessed with realism” (Eco 1986, 4), these simulacra can be favored over the original, no matter whether these copies are rational or even real (Baudrillard 1994). Hyperreality becomes successful when simulations and simulacra have been deemed as more important and real than the original reality that was copied (Berger 2005). In Umberto Eco’s essay “Travels in Hyperreality,” he discusses a variety of these landscapes, including wax museums and Disneyland, noting that these spaces are subject to the human gaze which results in competing realities (Eco 1986). These lands are quite complex and may be difficult to spot, because in order for an illusion to dispossess reality, it must seem completely real to the viewer: “The sign aims to be the thing, to abolish the distinction of the reference, the mechanism of replacement” (Eco 1986, 7) as “the signs of the real [substitute] the real” (Baudrillard 1994, 2). The goal for this replacement is not that “we are giving you the reproduction so that you will want the original,” but rather, “we are giving you the reproduction so you will no longer feel any need for the original” (Eco 1986, 19). The distinguishing trait between the ‘original version’ and the ‘copy’ is that the copy tends to be saturated with realness, and that it is permeated with ideological notions of what is regarded as real. Eco believes that “we are surrounded by ‘messages,’

products of political power, of economic power, [and] of the entertainment industry” (Eco 1986, xi). Within these constructed landscapes, “the hallucination operates in making the visitors take part in the scene and thus become participants in that commercial fair” (Eco 1986, 43).

In addition, Eco (1986) states that hyperreality can drastically alter the way people perceive nature itself. According to him, Disneyland is a good example of how wildlife can be incorporated in this space: “A real crocodile can be found in the zoo, and as a rule it is dozing or hiding, but Disneyland tells us that faked nature corresponds much more to our daydream demands [...] you risk feeling homesick for Disneyland, where the wild animals don’t have to be coaxed” (Eco 1986, 44). Scholars have looked at how wilderness has been framed differently around the world, whether these animals exist in zoological gardens (Mäekivi and Maran 2016), game farms (Brooks et al. 2011), wildlife parks (Knight 2010), theme parks (Ong 2017) or in the wild (Sæþórsdóttir, Hall, and Saarinen 2011). In these human constructed landscapes, animals acquire meanings that conform to different ideologies. The notion of wilderness itself is built through ideas and practices that reflect the culture and historical period, as it reveals “more about those who describe it than about the ‘nature’ they describe” (Sæþórsdóttir, Hall, and Saarinen 2011, 252). There is a wide spectrum of human manipulated lands; some of these spaces require intensive human intervention, such as zoos and theme parks, while others are more subtly fabricated, such as natural parks and reserves.

In the case of more subtle forms of hyperreality, landscapes are given purpose through activities such as tourism (Brooks et al. 2011). Observation of nature is key in many of these sites, and we tend to fulfill our notions of wilderness by going to these places (Brooks et al. 2011; Knight 2010). As a commodity, our dreams depend upon representations of the world which are oftentimes more fantastic than real. There are repercussions for such actions, as they

influence the perception people have on the landscape. Specifically, these notions of wilderness can obscure the past, erase the human presence (Brooks et al. 2011), change the physical landscape (Brooks et al. 2011; Havlick 2018) and omit undesirable social components (Ong 2017). Hyperreality, in association to wildlife, has implications for the relationships between animals and humans, since these interactions differ from what is typically seen in the wild (Ong 2017). These interactions are predetermined according to specific purposes: whether it be for education and entertainment (Ong 2017), hunting (Brooks et al. 2011) and/or tourism (Knight 2010). Activities such as wildlife tourism and theme park shows aim to present animals close to the visitor. In the wild, these animals would be difficult to see or completely inaccessible to human sighting because they live in secluded areas, are difficult to locate, or are fearful towards people (Knight 2010; Ong 2017).

Thus, these animals are not only staged, but they have also become accustomed to the presence of people (Knight 2010), consequently becoming objects of tourism. It has been noted that in places such as theme parks, wildlife animals will often be anthropomorphized and ascribed human attributes through physical and perceived proximity (Ong 2017). In zoos where animals are captive, there is intensive management of every aspect of an animal's life, whether it be mating, euthanizing, and feeding, which leads to the eventual 'taming' of the animal. Although slightly different, this situation can also be seen throughout some conservation programs since they closely monitor animals through intensive management, especially those that are endangered (Ong 2017). In this sense, animals become part of the hyperreal space as we construct a new identity for them.

Chapter Three: From Dead Ducks to Lively Bald Eagles

Overview

The trajectory of wildlife as signs of toxicity and safety in the Arsenal cannot be fully understood without taking a step back into the site's turbulent past. In order to capture a segment of the Arsenal's historical account, this study will look at the archival materials of the site from the 1940s to the 1990s. By studying the past accounts of wildlife and their relationship to humans, we can apply diachronic analysis, or the study of signs evolving through time, which will help expand on the current day narratives that I describe in Chapter Four. Analyzing the succession of wildlife's significance shows the prioritization process undertaken by the DOD and DOI, and more importantly, the meanings being left behind as a consequence. In order to show how humans have engaged with these animals in the past, I discuss in the following section the story of two major birds in the Arsenal, the waterfowl and the eagles, which act as a synecdoche for wildlife. The first section analyzes how the dead bodies of the waterfowl constitute the signifier of the wildlife sign, whose signified revolves around the contamination at the site. The second section looks at another wildlife sign, the bald eagles, whose mere presence acts as the signifier. Unlike the dead waterfowl, their signified meaning emphasizes the notion of safety on the site.

As mentioned before, this chapter examines a series of collections exclusively from the Norlin Library archive. One collection comes from Adrienne Anderson, an activist who worked with various environmental justice organizations. In addition, from 1993 to 2005, Anderson was an Environmental Studies professor at the University of Colorado Boulder. Archival materials are also used from Patricia Schroeder, Colorado's House Representative, who opposed Cold War

weapon production and was actively engaged with the cleanup at the Arsenal. Although she was critical of the Army's proclamations that the Arsenal was completely safe when it was a military site, she eventually sponsored the legislation that turned the Arsenal into a refuge. Pat Schroeder was not the only Congress member to collect what are now archival materials about the Arsenal; Hank Brown, a Republican Congress member, also gathered materials regarding the Arsenal. Finally, this study uses archival materials from John C. Cobb, who was part of the State Board of Health on the Air Pollution Control Commission of Colorado and who was involved in environmental issues.

A History of Contamination

From 1942 to 1978, the Army controlled most of the land in the Arsenal for industry use. During this timeframe, the Arsenal spread contamination throughout the landscape, as people had little understanding of both the toxicity of human-made chemicals and the proper disposal of industry waste. While pesticides received public attention for their toxicity through the grassroots environmental movement sparked by Rachel Carson as early as the 1960s, contamination violations would continue to plague the Arsenal into the 1990s. For instance, in 1975, one article from *The Denver Post* discussed the presence of the contaminant Diisopropyl methylphosphonate (also known as DIMP), a chemical byproduct from the manufacturing of Sarin nerve gas, in water wells that were only one mile away from Brighton's municipal system. Although a few months before the Army had stated in a press release that there was no correlation between their manufacturing operations and the death of wheat nearby the site, the Army did acknowledge that they found traces of DIMP on the Arsenal. In this release, they mentioned that the small amounts of DIMP found in the field were not harmful, and that "its

effects on humans [are] about the same as that of common sprays used to control dandelions in lawns” (Kirksey 1975a, 15). This example is just one of many instances of past contamination violations, as the Arsenal has been a site of controversy throughout most of its history.

When the Arsenal was still an active industrial site, the Army was able to keep a veil of secrecy around the warfare industry for the sake of national security. Despite this secrecy, citizens living close to the Arsenal, such as those in the Irondale neighborhood of Adams County, became concerned about the implications the toxins could have on human health. Suspicions arose when signs of contamination began to appear, which started when farmers declared problems with their livestock and crops nearby the Arsenal. Once the idea of contamination gauged the attention of the public, the wellbeing of wildlife in the Arsenal began to garner interest in both the state and the public as a possible indicator of the consequences of these human-made products. For instance, despite the fact that ducks and other waterfowl were dying in large quantities at the Arsenal due to exposure as soon as 1951, these deaths caught the attention of the local media years later, in the 1960s and 1970s. Although the issues with the farmers were well underway before the death of the waterfowl received public attention, the waterfowl incident became a more prominent sign of contamination. Their deaths would later be “essential to the successful conclusion of a more than two-decades-long court battle by the state of Colorado for compensation from the Army and Shell” (Krupar 2013, 92). Currently, wildlife mortalities have been better understood at the site, as it has been estimated that over 20,000 ducks died in the 1950s, with 1,800 waterfowl deaths occurring from 1981 to 1987 in one basin (Edson et al. 2011).

The Arsenal’s history involves the sacrifice of many wildlife animals due to contamination. As professor Krupar (2013) argues, there is a disparity of animal representations,

as the Arsenal caused the death of hundreds of waterfowl while simultaneously acting as a refuge for the safety of bald eagles. While some animals, such as the bald eagles, are national symbols, others become what she considers biomonitors that indicate the effects of chemical exposures. She argues that these biomonitor animals “serve as instruments for assessing the site’s condition and for laying claim to compensation for ongoing injury, [which] haunt the site’s future development and testaments to safety” (Krupar 2013, 94). I would add that these distinctions in wildlife signage reflect two integral points. First, I argue that these transitions reveal the society’s attitudes towards the environment, which are reflective of what semiotics calls codes. These codes are crucial to understanding how the wildlife signs in the Arsenal came to be, as they act as a framework in which signs are organized into meaningful systems (Chandler 2018). Second, the relationships between humans and animals through these different time periods reflect the way the animals in the Arsenal have served varying purposes for its legacy. In the case of this chapter’s section, the dead bodies of the waterfowl became a public semiotic signifier whose meaning revolved around questioning the safety within the Arsenal in its heightened state of controversy.

To begin with, the death of the waterfowl began in the 1950s, but could have gone unreported before then. In the 1950s, Shell bought the previous company Julius Hyman Co. in the Arsenal, as well as the rights to produce the now banned chemicals aldrin and dieldrin in the United States, precisely at the time when the waterfowl crisis, the first major pollution violation, was occurring (Obmascik 1988). At the time, the natural ponds in the Arsenal, such as Upper Derby and Ladora, were being used as a cooling system for chemical manufacturing (Obmascik 1988). In these spots, dead ducks started to appear, which warranted further investigation. In the 1950s, two Army employees, Dr. Julius Hyman, and other personnel, inspected the cooling

system line and the issue became clear as they were hit by the strong smell of aldrin (Obmascik 1988). Apparently, Shell executives had carried out their own studies, concluding that the duck poisoning “may be possible” (Obmascik 1988, 1-H) due to the aldrin and dieldrin present in the water, but did not proceed to clean up the contamination. The lack of response was apparent when in the 1960s, a field agent from the state division of wildlife first visited the Arsenal and witnessed ducks “in varying stages of paralysis flopping around on Shell’s ponds” (Obmascik 1988, 1-H). When the agent raised his concerns to the Shell plant executive, the manager stated: “that’s just the price of doing business if we are killing a few birds out there” (Obmascik 1988, 1-H).

The dismissive response of the Shell executive is reflective of the general mindset at the time, as the earlier part of the Arsenal’s history illustrates varying codes that reflect U.S. society’s values and attitudes towards the environment and wildlife. The history of the waterfowl in the Arsenal contrasts remarkably with the current notion of the Arsenal being a protective refuge. As was established in the previous chapters, animals are agents which help us come to a better understanding of what is happening not only culturally, but also during a certain time period. The notion that popular culture would consider the slaying of hundreds of ducks as an immense violation to wildlife, for example, is a consequence of current animal activism and environmentalism. Although this chapter focuses on archival materials, a few of my interviewees mentioned the fact of the evolved differences in these codes that reflect different time periods. Sullivan, the interviewee from Open Space and Mountain Parks, discussed in more detail the contrast between contemporary environmentalism and American World War II and Cold War culture as we talked about the history of the Arsenal and Rocky Flats:

We need to share and interpret these [warfare] stories— they are very compelling stories. I was talking at the Rocky Flats [meeting] and I wanted them to have a whole thing about

trying to help a kid who was born in 1999 understand 1950s paranoia. You know, have you ever seen anything about the blitz of Britain during World War II and [when] the Germans were flying nightly raids over Britain and dropping bombs on the city? Any idea what it would have been like to live through that? Unbelievable. The risk that your house, and your family, could be blown up at random on any particular night, just boom [...] your life was always hanging in the balance (Interview with Sullivan, September 25, 2019).

This interviewee personally experienced both these wars and expressed that there existed a generation gap between the understandings of different time periods. This nationwide fear that this interviewee discussed legitimized the continuous production of weapons throughout World War II and the Cold War in sites such as the Arsenal. The wartime paranoia narrative that prioritized national security created a lagging interest in the general public towards the Arsenal's animals and enabled the secrecy about the activities occurring at the site. Contamination and wildlife seem to share narratives of obscurity in this part of the Arsenal's history.

In the 1960s, public interest in the Arsenal shifted as the death of the waterfowl gathered the attention of the public. During this era, the mass social environmental movement was beginning to gain traction throughout the United States, drawing attention to the impact that humans had on the planet. In 1962, Rachel Carson's *Silent Spring*, arguably one of the most influential pieces of 20th century environmental literature, brought to the forefront the severe impact human actions have on wildlife and was the first major piece of environmental writing to discuss the Arsenal's pollution (Carson 1962).

Despite the increasing concerns, public officials attempted to deny responsibility for the deaths of the waterfowl. However, the USFWS acquired the necessary documentation in 1963 and concluded that these ducks were indeed poisoned by insecticides made by Shell. Although the USFWS did bring these deaths up to the Arsenal's officials, the Army would continue to deny the toxicity of the lakes. Colonel Gerald Watson, the leading commander of the Arsenal in

the early 1970s, stated that these ducks’ deaths were long standing because “carcasses [were] collected from the lake [F] periodically” (Kirksey 1975b, 19). He acknowledged that the birds did die from exposure “caused by a detergent effect of the water in Lake F that stripped their natural protective oils and [made] them incapable of either floating or flying” (Kirksey 1975b, 19) but disagreed that the lake was toxic as he said that “the Army [had] conducted tests with the ducks on the Arsenal, injecting water from the lake directly into the fowl with no ill effect” (Kirksey 1975b, 26).

Within the history of the Arsenal, the waterfowl issue brought to the forefront many concerns about pollution and about the cleanup strategies being pursued. The waterfowl problems continued during 1975, as in one month “nearly 300 dead birds were discovered [...] by state and federal game agents” (Kirksey 1975b, 19). Once this issue became a public concern, solutions to this decade’s long-established problem were finally being pursued. Initially, the Army employed flashing lights, streamers and a wire grid to scare away birds from the lake (Kirksey 1975b). Then, the Army came up with another solution for contamination on the site by accumulating the waste and putting it in a disposal well, which caused small earthquakes in the Arsenal and the surrounding Denver areas in the 1960s.

<p>SIGN</p> <p>Wildlife</p> <p>↓</p> <p>Synecdoche: Ducks</p>	<p>Signified: Suspicions/Concerns</p> <p>↓</p> <p>Peril and Contamination</p>
	<p>Signifier: Dead ducks</p>

Table 1: The semiotic structure for the dead waterfowl.

According to these archival materials, the ducks became instrumental as signs that made the Arsenal's contamination visible and real. Although the death of the ducks and waterfowl were the most prominent sign of contamination, there were other animals that have been sacrificed due to contamination. In fact, the case of the waterfowl is not an isolated occurrence where an animal is being used as a synecdoche of wildlife to convey a sense of danger. Synonymously, different wildlife has functioned as signifiers for the same meaning, which consolidates the narrative of contamination at the Arsenal. For instance, during my archival study, I came across two different articles that use other animals as signifiers to convey the same story. In 1973, Pat Schroeder's administrative assistant Dan Buck and accompanying administrative assistant McQuery were given a tour with two colonels through the Arsenal, and as they were leaving, they "stumbled across a dead robin. Then on the front lawn of the arsenal headquarters building [Dan Buck] found another" (Wolf 1973, 8). While they decided not to come to any hasty conclusions about these animals or go back to ask the colonels about them, during their drive back, they came across "a rabbit they saw having convulsions on [A]rsenal property" (Owen 1973, 1). Both articles end with the same note: "[T]hey sped away from the [A]rsenal with an eerie sense of premonition" (Owen 1973, 1). This story reflects the sudden use that wildlife was beginning to have in the public imaginary, as a fearful reminder of the implications of contamination on the public. As a form of semiotic isotopy, a series of different signifiers with the same signification repeat one coherent story.

The Arsenal at that time notably manifested as a site that enabled people to question their own safety in comparison to the events that occurred with the wildlife and equated the wildlife with their own personal health. Of the studies performed on wildlife that reflect the effects of contamination, a study done on minnows was mentioned in a couple of my sources. Although the

original study aimed to look at how DIMP affected the mating behavior of minks in Michigan, the resulting deaths of the minks in the study became relevant at the time when locals living near the Arsenal were concerned about DIMP contamination in private wells. The deaths of the minks would eventually factor into the determination of what could be considered reasonable levels of DIMP chemical contamination in the drinking water at the Arsenal. A Commission Chair involved in the case mentioned: “[W]e’re usually talking about dead fish [and dead mink]; we’re not talking about dead people. Well, we’re talking about dead people here” (Knight 1994, 5G). Throughout this study, as well as others done at the time, the assumption was made that the effects that contamination have on the wildlife is reflective of human health and safety. At the time when concerns were raised about contamination, it would make sense that wildlife turned into indicators of human safety. They have become substitutes of human bodies illustrating what could happen to citizens in neighboring homes.

The association between wildlife and people was also implied in the way the Army approached the toxicity of the place. In Colonel Watson’s interview, he brought up how the Arsenal had the best managed wildlife program in the state, exclaiming that they had the best duck hatchery as the “Arsenal personnel have blown holes in the ground in low spots on the 27-square-mile facility [...] where water collects and weeds and cattails flourish making them ideal breeding spots for the ducks” (Kirksey 1975b, 26). It is interesting to note that in the same interview, just as he mentioned the growth of the duck population, he also mentioned that the human population around the Arsenal would grow in the next 30 years, exclaiming “I can think of no other benefit that would exceed a 17,700 acre national park in the center of a city” (Kirksey 1975b, 26). Whether or not this was intentional, he indirectly compared the growth of both humans and wildlife when discussing the possibility of a wildlife preserve. Despite the public

concern of having a stockpile of nerve gas so close to Denver (Pattridge 1973), the Army stated that the Arsenal was concerned with the safety of both land and people (Wolf 1973).

Instead of being shown as evidence of contamination, the Army promoted the Arsenal's wildlife as proof of normalcy. Even with the legacy of the dead ducks, in the tour that concluded with two dead robins, the guiding Colonel mentioned, "The wildlife here is one of the best indications that everything is okay [...] if anything were wrong, the wildlife would die first and tip us off" (Wolf 1973, 8). The Army communicated to the local press that Lake F was an exception to the studies of wildlife health performed at the Arsenal, which showed "no deviation from the norm, anywhere" (Kirksey 1975b, 26). Although the idea of converting the Arsenal into a refuge may have started sooner than what my archival sources depict, it seems clear that a seed of the idea was planted in the late 1970s. By denying notions of contamination, the Army dismissed the established signified of "contamination" and "peril" for the wildlife signs (such as ducks, red robins, rabbits, minks), and created a new meaning by introducing them into a new discourse of transformation and sanctuary.

Here Come the Eagles

While the wildlife once signified the toxicity of the site, they were eventually introduced into a new discourse that transformed the site into a refuge, which is more dominantly seen with the bald eagle. During my visits to the Arsenal, I had many experiences with the wildlife signage, but nothing was more spectacular than spotting a bald eagle. In quite a few instances in bus tours, visitors would always scan the tree lines to spot bald eagles, and when they did, everyone would desperately take out their phones or cameras in an attempt to get a good shot. The exhibition of the wildlife at the Arsenal, which I will refer to more in Chapter Four,

propagates the meaning of the bald eagle, as it emphasizes the sighting of wildlife over the sighting of contamination. The eagles on the site gain even more significance considering that they serve as one of the many symbolic animals of the United States of America. Anyone visiting the Arsenal and looking at the history of the site, whether by accessing the website, reading the exhibit panels at the Visitor Center, or by listening to the tour guides, will come across the story of bald eagles. One of the exhibit panels at the Visitor Center voices the same tale that is repeated through different venues, albeit slightly more elaborated:

In November 1986, a U.S. Army contractor spotted a communal roost of bald eagles high in the cottonwood trees along First Creek. Despite decades of manufacturing activity, much of the Arsenal's original 27 square miles remained untouched and provided a safe haven where eagles and other wildlife flourished. Since bald eagles were then on the endangered species list, their discovery prompted the U.S. Fish and Wildlife Service to become involved at the site to monitor and manage the wildlife during cleanup. The discovery of bald eagles further led to the detection of a diverse and rich population of wildlife. Public interest triggered a successful grassroots effort to have the Arsenal declared a national wildlife refuge (Visit 1, Arsenal, September 6, 2019).

The guide of the tour where we saw the eagle up close explained that the USFWS was indebted to these birds, as they were critical to the creation of the refuge. The tour guide and the exhibits at the Arsenal's Visitor Center suggest that the presence of these birds gave the gift of a sanctuary that now other animals and people can enjoy.

While bald eagles were certainly endangered and were able to find shelter within the confinements of the refuge, there are parts of this story that merit further attention as they reveal the alternative reasons why the Arsenal was dedicated to wildlife. As the narrative goes, bald eagles were 'discovered' in the Arsenal in 1986, thus receiving major attention throughout the 1990s and onwards. However, their presence seems to have been noted earlier, as indicated in newspaper reports. For instance, Colonels Watson and Bass in 1973 who worked at the Arsenal discussed how they had "76 species of birds [at the Arsenal] including some American eagles

which [were] nesting” (Wolf 1973, 8). Meanwhile, a brochure of the USFWS service also confirmed these vague mentions of eagles that the Army had noticed for decades (U.S. Fish and Wildlife 1994). What is important to note here is that these eagles were spotted earlier than 1986, during a time when they were already on the endangered species list. The first list of animals that were granted legislative protection under the Endangered Species Act, called the Class of 1967, included the bald eagle, whose major threats were pesticides and habitat degradation. Thus, despite having been on the list since the 1960s and despite army workers seeing the bald eagles in the 1970s, the protection of the bald eagle was officially being considered in the late 1980s at the Arsenal. Before the late 1980s, the bald eagles were not the driving point of the refuge, and their presence was mentioned as that of any other animal. Their “endangered status” was never the focus of the wildlife in the beginning of the Arsenal’s history, but they are now a species of state concern even after being officially delisted from the Endangered Species Act in 2007.

To what extent did the bald eagles play an important role in the creation of the refuge? After the closure of the industry on the site, there were debates about what to do with the Arsenal’s land. When the Stapleton International Airport existed, some politicians discussed a possible extension of the airport on the Southern corner of the Arsenal. Others talked about the idea of developing the land for real estate. However, for these proposals to become a reality, billions of dollars would need to be invested for a full cleanup operation to allow for human habitation, and transportation of toxic products was a major issue. Then, the previously thought idea of the Arsenal becoming a refuge gained momentum, emphasizing that this transition would be a great benefit for the community. Particularly, Congressman Hank Brown proposed to keep the Arsenal’s land under protection of the state and local governments in the early 1980s, which led to the eventual creation of the refuge. One article stated how there was an envisioning of

“camping sites, fishing and swimming [...] archery ranges, horseback riding trails [...] and bird sanctuaries” (Pattridge 1973).

Meanwhile, the presence of bald eagles renewed old embedded symbolic meanings that intertwined with newer notions of cleanup security, especially during the peak of cleanup conflicts between the public, the state, and the Army. While waterfowl became a sign during the beginning of the Arsenal’s contamination narrative, the representations of bald eagles had significantly more power in the Arsenal due to its deeply rooted history within the American imagination. Although the meaning of the eagle’s significance started back in Europe’s ancient cultures, the bald eagle symbolic power in the United States was carved out in the 1770s (Lawrence 1990). For instance, in the initial planning of America’s emblem in 1776, the illustrated bird was first a golden eagle, but was then replaced by the bald eagle thought to be exclusively found in North America. At a time of war against England, it seemed suitable to choose an animal with war-like connotations to represent the United States, as well as to solidify national solidarity and independence. As the American emblem, the natural and physical appearance of the bird has been imbued with rather contradictory notions of dominance and humility, freedom and authority, fury and magnificence (Lawrence 1990); yet, it embodies values to which average Americans can still relate. Thus, it is not surprising that the bald eagle has remained the national bird of the United States ever since 1782.

Although the Great Seal of the United States is not shown at the Arsenal, the eagle’s representation at the site constitutes a clear case of intertextuality, a semiotic concept in which one text alludes to a preexisting text. During my visits to the Arsenal, I have spotted times when bald eagles were used in association to patriotism, the military, and authority figures. For instance, in one of the Visitor Center’s entrances, there is a picture of the president Donald

Trump, with a plaque nearby that acknowledges the people who defended America and created the wildlife refuge (see appendix C, figure 1).

In addition to its historical significance, the bald eagle is also known for its endangerment status. The Bald Eagle Protection Act of 1940 emphasized how the bird's population and home range was being severely depleted due to various anthropogenic factors, while it also noted that "the bald eagle is no longer a mere bird of biological interest but a symbol of the American ideals of freedom" (Lawrence 1990, 67). The life of the birds was not the only thing at stake, but also the values that North America cherished were at peril due to our own bidding. Transitioning into the symbol of the vanishing wildlife of America, the bald eagle puts to the test the traditional notions of protection, for "if the bald eagle can be saved, so too can the soul of mankind which, for centuries, this bird has symbolized" (Leeson, Leeson, and Black 1988, 117). The Arsenal suits this narrative perfectly, as it has the necessary components to create an ironic success story for these birds: the Arsenal has a natural bald eagle population on a contaminated piece of land where the military can retroactively create a long-lasting legacy of protection.

While Shell and the Army were solely responsible for cleanup at the Arsenal in the 1980s, the federal facilities agreement was signed by the Department of Justice, Department of Interior, U.S. Army, Environmental Protection Agency (EPA), and Shell Chemical Co. to ensure the appropriate cleanup of the Arsenal according to the regulations stipulated in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). In this web of agencies, the State of Colorado's Health Department oversaw the well-being of its citizens, while the USFWS oversaw the well-being of the animals, most notably the eagles, during the cleanup phase. Although their end goal was to eventually establish a wildlife refuge,

the USFWS's main priority in the late 1980s was to protect the bald eagles by creating a management area that would monitor the local populations.

As soon as the USFWS policies were set in place, they caused another series of changes, such as opening the Arsenal to the public. It is important to realize that the supervised visits began before it was officially opened as a refuge in 1992 and continued even when cleanup was underway and under debate. For instance, it was from 1990 to 1996 that the Arsenal faced its water contamination crisis, as Adams County residents became aware of the contamination of DIMP in the wells that were used for domestic purposes, and negotiations between the Army and the State to seek a solution became tense (Obmascik 1995). Nonetheless, the Army began escorting bus tours for bird watching and for wildlife enthusiasts on March 12, 1989 (Schmidt 1989). At the time, although officials involved in the cleanup said that some surface soils on the site were so toxic that fieldworkers needed to wear specialized equipment, the USFWS studies indicated that very few wildlife showed signs of contamination, reasoning that the pollution seemed quite localized (Schmidt 1989).

While the USFWS took visitors on tours, Denver attorney Sandra Jaquith voiced the concern of surrounding neighborhoods: "There's no cleanup at this site. There's nothing but a cover-up [...] it's simply a matter of land filling contamination" (Obmascik 1995, 18). Indeed, Schroeder, who supported the Refuge Act of 1992, was outraged to hear the Army's plan to dump contamination in a landfill, saying: "I don't know who came in and decided to do this, but they better sit down and back off. We already said [the Arsenal's] primary usage is a wildlife refuge and not a dump" (Kerwin n.d., 18A). Health officials publicly discussed closing the tours due to safety concerns in the early 1990s over the possible remaining chemical weapons and pollutants underground (Kerwin 1993b). Nonetheless, the Army reassured visitors they were safe

despite being constrained to the buses and not being allowed to walk without supervision (Kerwin 1993b). Ironically, as the early tours were conducted, a dozen nerve-gas canisters were located, and even in 1992 one was discovered hours after 500 dignitaries had left from a party (Kerwin 1993b). Other incidents occurred, such as a phosphorous incendiary device reacting with air and lighting which caused a small fire next to the bus route (Kerwin 1993b). Even in the early 2000s, there were reports of unexploded ordnance findings (Krupar 2013).

Despite these uncertainties around safety, the Arsenal's overall mission to protect the eagles, and subsequently the environment, inadvertently correlated to the safety of the visitors. Once the Rocky Mountain Arsenal National Wildlife Refuge Bill H.R. 1435 passed, Hank Brown said plainly in a public statement: "The bill, similar to legislation I introduced last year, will preserve and protect the wildlife at Rocky Mountain Arsenal and at the same time ensure a swift and thorough cleanup of the site" (Brown 1992, 1). The function of the bald eagle as a sign of safety was reinforced by the numerous events relating to the animal, such as National Eagle Day, programs taking raptors and eagles to schools, and the fact that a watchtower area was open to the public so people could closely examine bald eagles in the wild. By promoting interactions between the bald eagles and the public, people began to recognize eagles as a sign of no contamination. The association between cleanliness and the bald eagles is further shown by the fact that one of the major cleanup operations that occurred was called "Project Eagle." Even now, a few of my interviewees have noted the role that wildlife has played to make the site look safe. One of my informants, Sarah, who did outreach in nearby neighborhoods during the cleanup, explicitly brought up the bald eagle when discussing what she thought was most problematic about the place:

[The Arsenal] still [has] Basin F crap out there [...] It's so widespread— that is not a playground, but they are treating it as such to normalize it in the public eye. [The

Arsenal’s officials will say things like] “Oh look, those guys look okay, I do not see any problems with those eagles” (Interview with Sarah, December 3, 2019).

Sarah emphasized that while there is still contamination buried underground, wildlife acts as supposedly proof that the Arsenal is safe through the presence and abundance of bald eagles. Thus, with the indication that bald eagles were being cared for, there has been, and continues to be, the indirect implication that people are also protected. Ultimately, the presence of eagles has led the Arsenal’s administration to establish the wildlife’s signified of safety and cleanliness that is still prevalent today.

<p>SIGN</p> <p>Wildlife</p> <p>↓</p> <p>Synecdoche: Bald eagles</p>	<p>Signified: Safety</p> <p>↓</p> <p>Cleanliness and human safety</p>
	<p>Signifier: Presence of bald eagles</p>

Table 2: The semiotic structure of the bald eagles.

Being so saturated with different synecdoches for wildlife, such as mink, ducks, robins, and eagles, activists have continuously revived the debate about the Arsenal’s safety. A few advocacy groups and environmentalists in the 1990s feared that the emphasis on wildlife would come at the expense of the cleanup process, and would be used as a ploy in order to reduce expenses (Dispatches 1993). For instance, the Environmental Information Network, an organization that did outreach in the Montbello community when the Army was preparing to burn up the Agent Orange on site, became hesitant about how wildlife was being used. This organization mainly focused on the Montbello community that felt that they were being

overlooked by the Army as a maximally impacted neighborhood. In the early 1990s, suspicions rose early in the cleanup negotiations when the Army deviated from standard Superfund protocol and asked the EPA to never allow people on the site again. A Colorado Department of Health official responsible for overlooking the cleanup responded, “When the [A]rmy said that no one could ever live at the [A]rsenal, that meant that the risk of exposure of humans to toxics drastically decreased, so the level of the cleanup could be decreased” (Dispatches 1993, 26). In fact, a few of my sources made the argument that bald eagles have become “the symbol of everything that is wrong about the cleanup at the Arsenal” (BUMP 1996, 6), refuting the story of the Arsenal’s creation. Although the archival materials in the Norlin Library did not have enough sources on this subject, and the few that brought this up were unverifiable, there have been rumors that the bald eagles were essentially being baited to nest in order to keep them as attractions for visitors and not for only conservation purposes. For instance, Sandy Horrocks, who monitored the Arsenal’s cleanup for Sierra Club, expressed skepticism about the purpose the site had for the bald eagles: “[F]ood was laid out for [the bald eagles] by the U.S. Fish and Wildlife [...] This was how the [A]rsenal’s greatest public relations attraction was guaranteed” (Horrocks 1998). While in this research I was unable to find concrete evidence for these claims, one of my interviewees heard rumors about how the bald eagles were being kept on site, as the Army fed them deer road kill so that they would not eat contaminated food sources (Interview with Sarah, December 3, 2019). Whether or not these rumors reflect the truth, they do reveal the mentality of skeptic citizen groups and the potential power the bald eagle carries on the site. If we look at eagles from this approach, it creates a stark contrast to the hegemonic narrative of safety on the Arsenal, since it goes against these very notions. The argument of these activists underlines the fabricated nature of the Arsenal’s narrative.

While bald eagles convey a sense of safety and change the way the public relate to the once-secretive landscape, they also have the potential for reframing the way we approach the contamination of the site, fulfilling our environmental desires while allowing those responsible to be viewed in a better light. As time has passed, the presence of the Army has been subdued, taken over by the wildlife buffer zone that is the Arsenal. As waterfowl started out being signs of suspicion and contamination, the presence of the bald eagles further emphasized the refusal of accepting contamination. These signs, as shown through behaviors and reactions of the participants involved, offer a glimpse into the ‘thick description’ of these events. In this chapter, I analyzed the construction of the wildlife signs through two synecdoches, or rather through different animal species such as the waterfowl and bald eagle; the next chapter will look at the context within which these animals exist.

Chapter Four: The Hyperreal Sanctuary

Overview

With the establishment of the USFWS, a series of drastic changes were quickly underway in the 1990s, modifying how people interacted not only with the site, but also with wildlife. Many institutions that manage animals, such as the USFWS, take a ‘neutral’ approach in their conservation programs by grounding their actions and legislation in scientific rationality that supposedly limits individual bias (Mäekivi and Maran 2016). Despite these claims, the socially imbued values and ideologies of a society will impact what we consider to be rational, and just as there are scientific reasons for managing and protecting wildlife, there are also cultural reasons why and how to do so (Mäekivi and Maran 2016). The USFWS exemplifies this trend, as it is an agency that provides a new narrative of ecological rationality in many military-to-wildlife sites in the United States.

In the case of the Arsenal, Krupar has noted that environmental education and nature-based tourism are some of the elements that encourage the formation of the site as being authentic, when in reality it constitutes a spectacle representation of nature (Krupar 2013). Regarding the landscape, Havlick has indicated how the Arsenal attempts to fit into a picturesque image of pre-settler geography by appearing to bring the landscape back to its former glory through restorative ecology (Havlick 2018). Drawing from these scholars’ ideas of the Arsenal’s creation process, I argue that a hyperreal space is being constructed through the use of wildlife at the site, the conservation programs in place, and the interactions exhibited between animals and visitors. As mentioned before, hyperreality is the condition where one cannot distinguish between the copy and the real, which results in the creation of a simulacrum. Within this

landscape, humans and animals exist together in ways that reproduce a genuine experience of nature. While the refuge has tried to represent itself as a ‘normal’ natural space, I argue that the Arsenal is building a completely new landscape for both animals and people. Although this chapter will make references to materials from the 1990s, the focus will be on how the signs of safety have been augmented in the present through the fabrication of a narrative that involves the creation of a space that is both an asset to the local community and a sanctuary for animals.

Endangerment Narrative

During the Arsenal’s history there were a series of environmental contamination violations, closely tied to the overarching ecological crisis that is prevalent to today’s society. The endangerment narrative within the Arsenal is crucial as it stipulates that the site is one of the few places where wildlife can thrive safely without experiencing human impact. As Krupar states, “military sites function as salvific arks for endangered species” (Krupar 2013, 54). This approach dilutes aspects of the ‘real,’ which in this case is the human intervention in the landscape. The narrative sets up the perfect justification for the simulacrum, or the artificial copy of the site, to be established and to create a hyperreal space where visitors cannot distinguish between the exhibited wilderness and the “true wild.”

The Arsenal prides itself on the multitude of wildlife species it harbors. According to several interviewees and from my personal experience on the site, the wildlife species that visitors admire the most include the American bison, bald eagle, and black-footed ferret. There is also a wide array of wildlife to suit any individual’s preferences, such as the mule deer, black-tailed prairie dogs, various fish, and a multitude of bird species. Despite the striking differences among the most popular wildlife species, they ultimately share one commonality: a state of

endangerment. These animals are known for the ways they have been threatened by the consequences of human action, such as development, industry, and hunting. Through my various visits, these animals as well as others in the Arsenal, were framed within an endangerment narrative.

While the bald eagle better exemplifies the consequences of anthropogenic actions, there is an abundance of stories from which to choose at the Arsenal. For instance, the American bison used to roam the prairies throughout the Midwest by the thousands, but their population sizes have been greatly diminished due to American settlers. The bison played a foundational role in prairie ecosystems by assisting in flora growth and making viable habitat for other species. The surviving bison populations have faced an even greater threat when settlers cross bred their cattle with wild populations, subsequently causing a drastic change in the bison's genetic constitution. The bison are considered as being "functionally extinct," a term used when wild populations of a certain species have become so small that they no longer play their original role in the ecosystem. As a result of their endangerment, they became representative of the prairies, a disappearing landscape.

Currently, the most endangered wildlife species that exists in the Arsenal is the black-footed ferret, one of the few federally endangered animals that Colorado recognizes. They were also at the brink of extinction because of various anthropogenic factors, including loss of land due to development and agriculture, reduction of their main food source, and waves of disease such as plague and rabies. As early as 1979, black-footed ferrets were designated as extinct. However, in 1981, what is thought to be the last remaining wild colony of black-footed ferrets was found in Meeteetse, Wyoming. Since their discovery, conservationists have worked diligently to increase their population through captive breeding programs.

The bald eagle, bison, and black-footed ferret continue to be protected within the boundaries of the refuge. The safety of endangered wildlife has always been the dominant concern expressed at the site. While it has garnered a reputation for its contamination in the past, the Arsenal is also one of the very first Superfund sites to be converted into a refuge. Despite its obvious radical differences from other refuges in the United States, the Arsenal is at best described as being “unique,” which is a term that I have heard tossed around the Visitor Center and in tours. Usually, “unique” is used to refer to the fact that the wildlife refuge is an urban oasis and a conservation success, rather than a site that continues to have buried contamination. As the video that is tagged on the Rocky Mountain Arsenal website promotes, one can “discover what’s wild not far from home. Tucked between major highways, international runways, sports stadiums and city sprawl, is one of the largest urban wildlife sanctuaries in the country. And it belongs to you” (U.S. Fish and Wildlife Service 2014).

Indeed, ever since the late 1980s, the safety of animals became a factor in the argument of contamination cleanup and the future use of the land. The Army, with the assistance of the USFWS, began conducting studies in 1986 around bald eagles’ behaviors and interactions with the environment in the Arsenal. While in the past the USFWS has scrutinized the Army’s apparent disregard towards the environment, the Army and the USFWS began a co-operation for the sake of nature. Because of this cooperation, “the Army’s effort has yielded information on the eagle’s nesting, feeding and social habits as well as physiological information that, one day, may help save the species” (U.S. Fish and Wildlife Service 1994, 1), and ended up counting the presence of thirty-two bald eagles roosting within the Arsenal. The Army set aside 3,600 acres as a Bald Eagle Management Area, which the USFWS would oversee, as these “cooperative endeavors will be used in developing an ongoing plan of protection for the eagles roosting at

RMA” (U.S. Fish and Wildlife Service 1994, 4). Later, when the USFWS signed the Cooperative Agreement Fish and Wildlife Resources at the Rocky Mountain Arsenal in 1989, it was not necessarily to establish a wildlife refuge but rather to protect the wildlife from the cleanup efforts underway. Protection for the wildlife, particularly the bald eagles, became such an important factor that there were concerns about the safety of the wildlife during cleanup. As one magazine in 1992 observed:

Years long cleanup [will] perhaps endanger many of the very animals the refuge is supposed to protect [...] Many animals will have nowhere to relocate when vast areas of contaminated topsoil are removed to make the Arsenal safe for human visitors and all animal species that live there (Durkin 1992).

Even an official participating in the cleanup mentioned that “making the [A]rsenal pristine would destroy plant life and leave wildlife habitat devastated [...] Pristine may equate to a moonscape [...] It has no contamination on it” (Kerwin 1993a, 6A). Through this perspective, wildlife is ironically in danger from the cleanup, rather than from the contamination itself. This instance illustrates the success of the simulacrum of the Arsenal as partially being a protective sanctuary. The logic operating within the copy, or in this case the purpose of the Arsenal, is the one prioritized over a full cleanup.

Even as a space of protection, wildlife vulnerability continues to characterize the Arsenal by the fact that despite the attempts of the USFWS and Army to protect the wildlife, visitors can still have a negative influence. When I asked my two informants who have been actively engaged with the Arsenal about their main concerns at the refuge, they pointed out that during their time working there, the damage to the landscape due to visits and human-animal conflicts were the top concerns. This coincides with comments of various workers on the site, as they described several stories of clear irresponsibility. In the past, people would endanger the site through activities such as disrupting and stealing owl chicks from their nest, speeding

dangerously through the wildlife drive, going off the dirt trail, illegally hunting deer when no hunting is allowed, and getting too close to the bison. Although they admit that these problematic individuals tend to be a small minority, these issues occur with some frequency. My interviewee Dennis, who worked at the Arsenal, made references to human and wildlife conflict, as these issues were predicted to increase as the site gained popularity:

[During my time there] that was like the big talk, everyone was worried that, you know, people would be using the Arsenal as like a park rather than like a refuge for the animals and they were afraid that with so many people nearby, that the refuge would be overrun [...] At least when I was there, there was only two federal wildlife officers and only a handful of rangers that were able to do anything about it, like about either vagrants walking around and using the bathrooms or people being off [route] and out of their cars in the bison enclosure (Interview with Dennis, November 5, 2019).

The emphasis on wildlife safety establishes the Arsenal as the responsible, governing body that mitigates human-wildlife conflict. On top of this, one of the main goals while working with people on federal and state lands is to raise awareness about the current condition of wildlife. My other informant, Sullivan, brought up the importance of education for the general public:

Now you are seeing part of the reason I work in education, because what I am doing working with children, I hope, is trying to instill such a deep and inherent and abiding love for land on places like Open Space and Mountain Parks or Rocky Mountain Arsenal that they will grow up as the next generation choosing to protect and preserve it. (Interview with Sullivan, September 25, 2019).

In this excerpt, Sullivan emphasizes that it is up to the public to take care of the wildlife and make efforts to protect it. Even though the government and its legislation determine the conservation of federal lands, he considers that “public land lives and dies at the opinion of the public” (Interview with Sullivan, September 25, 2019). Education to the public, teaching them what and how to properly conduct oneself in nature, becomes one of the focal points. Typically, conservation emphasizes education in order to make the public more interested in the

environment. Although parks have different restrictions about visitation, most of them have some sort of educational component, which can range from expensive public events to a simple interpretive plaque along a dirt path. Thus, it is logical that the USFWS goals are to manage the wildlife, to work with communities and organizations, to create outreach activities (especially for urban citizens), to provide environmental education, and to offer wildlife-oriented recreational events. Tim, another interviewee who worked at the Arsenal, pointed out that the significance of the site is its educative power, and what it can teach to the public:

There is some sites, especially maybe the ones that aren't as close to an urban center, where education isn't necessarily their prime value; but, I think education is probably the primary one for the Arsenal and Rocky Flats and then secondary, probably a really close second, is the conservation value for grassland species, especially stuff like the black-footed ferret and bison. (Interview with Tim, December 29, 2019).

The interviewee underlines how the proximity of a refuge to an urban center, in this case Denver, can bring a lot of potential benefits to the nearby community. Although the value of conservation is vital, these sites gain even more importance and even depend on human presence.

Ever since the beginning of the refuge, education has been one of the emphases. For instance, in May 5, 1993, the Army, Shell Oil Co., and environmental organizations signed a cooperative agreement to make a commitment for educational opportunities (Shipley 1993). After this, children and classes were invited to tour the refuge, and to celebrate certain occasions. For instance, students from Kemp Elementary in 1994 went to the Arsenal to celebrate Earth Day. They went to the eagle watch area, gave the Arsenal a painted mural, and worked on a restoration project of native grasses in collaboration with the USFWS. The outlook was hopeful, as the fifth-grade teacher explained:

We wanted to help out in the yearlong project [...] to build a bridge for the future between the community and the US Fish and wildlife to enjoy everything that the Arsenal has to offer [...] it] gives us students a chance to be a part of nature and realize that nature can heal itself (Dinges 1994, 1).

A class of fourth graders from Denver's Schenck Elementary in 1994 went to the Arsenal with an educational aid, a "time capsule," which contained a guidebook outlining activities through the different historical eras in the site. The contents contained bison horns, wildlife skins, photographs, and other objects that "were selected to portray that community for all future generations" (Rocky Mountain Arsenal Wildlife Society 1997, 4). While this time capsule mentions the military presence, the framing of the activities revolves around wildlife. Ultimately, "the environmental education goal of the refuge is to motivate visitors to take responsibility for rehabilitating and managing this urban wildlife refuge and caring for the earth in general" (U.S. Fish and Wildlife Service 1996, 2). These examples mean to show that the Arsenal can be changed for the benefit of the community. Families and children continue to be one of the major target audiences of the Arsenal (Krupar 2007), which is exemplified by the fact that the Visitor Center's entrance is covered by children crafts and by the amount of materials and events designed for children (see appendix C, figure 2).

Education constitutes the framework that allows us to understand the representation of the site, or the site's simulacrum. In other words, education acts as the process, or simulation, that helps achieve the simulacrum and gives wildlife value due to its educational purposes. For instance, the National Wildlife Repository at the Arsenal illustrates the site's wildlife simulacrum. This repository is the only one in the nation to store illegal wildlife property that has been confiscated by the USFWS. Under legal jurisdiction, the facility houses hundreds of wildlife-made objects that are shown to the public to teach them about the wildlife trade. This repository raises questions related to human morals and values. When I participated in the tour, the guide allowed the visitors to go into the education room while we waited for the tour to begin. As soon as we stepped in, we were overwhelmed by hundreds of objects from around the

world cluttered into a single space, possibly to create a sense of “wonder” and to stimulate the visitor’s curiosity. Each animal and/or animal part came with its own identification tag, providing the most basic overview of the item, such as what animal it was, what type of object it was intended to be (a stool, mount, purse, etc.), and how it was received (donation, etc.). Yet, these animals’ individual stories were lost along the way. It was striking to find polar bear skins, rhino heads, and lion mounts in the middle of this wildlife refuge. These animal-produced objects now fulfill an educational purpose, since in such saturation of objects and images, it is easy for people to find themselves ‘disgusted’ by human actions. When talking about the repository to Tim, he mentioned how he felt it should be more accessible to the public than just a few times a month, due to the impact the exhibit carries to its visitors:

Every time we took a tour or people into the repository and they saw how much stuff was in there and you tell them, you know, depending on the figures, it is the second or third biggest black market globally, you know, I mean, it really makes an impact on people to see, you know, foot stools made out of rhino or elephant foot or tiger pelts, things like that. So, I mean it is—the repository, I think, is kind of an underutilized aspect, even though they loan a lot of items out to the Denver Museum of Nature and Science and other institutions like that. I think the tours had more of an impact than just items you see, you know, at the museum (Interview with Tim, December 29, 2020).

While the repository is less visited than other places in the Arsenal, it is important to note that, as Tim mentions, the assortment and abundance of items tend to have an emotional effect on visitors. The Arsenal’s repository is distinctive because it houses illegal wildlife objects and houses the National Bald Eagle Repository, an agent facility that stores and disposes of both bald and golden eagles, following the USFWS protocol. According to protective legislation, it is illegal to withhold eagle parts without a permit, and permits tend to be given to Native Americans who are part of federally recognized tribes. Thus, the USFWS acts as an in-between agency, controlling the use and movement of dead eagle parts. While both repositories embrace

different missions, they share a few similarities. These repositories call attention to individual responsibility, highlighting the Arsenal's role in the repurposing of neglected, abused or dead animal parts.

Within the endangerment narrative that shapes the Arsenal, reasonable concerns are raised about the influence of people, whether through the global destruction of the environment or the disturbances caused by visitors. This narrative often leads into emphasizing wildlife over the problematic history of the Arsenal's environment. According to my interviewees, there was no tour that strictly focused on the history of the Arsenal, except for the college classes that discussed the site's ethics. The previous history of the industries in the Arsenal is not ignored, nor denied. In many of my visits, the employees would refer to the Army when approaching the massive basins. In addition, anyone who walks through the Visitor Center's exhibit will read about the military presence on the site and see the hazard coat and munitions stacked on top of a wooden cart. Yet, that history is certainly not the focal point of the tours, as Tim brings up during our conversation about the public programs:

There are certain places where I know we would drive past the last remaining foundation of guard tower from the World War II prisoner of war camp and it was kind of obscure but I would always talk about that or a lot of times you would use it as filler material if, you know, you are not seeing very much wildlife or, you know, there is not much to talk about at certain points (Interview with Tim, December 29, 2019).

According to Tim, history can be brought up, but it is only a topic of personal choice mentioned when there is nothing else to talk about. Although during the interview he emphasized that it is fundamental to take into consideration the site's history, he noted that the focus is now the wildlife. Not only does the military history have a lower priority within the narrative, but by emphasizing wildlife, there is a disconnection between the past and the present conditions of the site. Thus, the endangerment narrative of wildlife not only makes the Arsenal a sanctuary, but it

also brings into focus the responsibilities that the general public has towards the environment. The blame, once placed on the Army and Shell, is now seemingly displaced towards the general audience. The endangerment narrative eventually led to the involvement of the USFWS, which in turn provoked an emphasis on educating the public about wildlife which further promotes the simulacrum of the Arsenal as being one of the last remaining wildlife landscapes.

Being Wild and Seeing Wild

Just as any other wildlife refuge within the general refuge system, the Arsenal deploys a wide array of conservation programs and strategies in conjunction with recreational and tourist purposes, which has drastically modified both the physical and metaphorical landscape itself. Under ordinary circumstances, these changes would not necessarily seem damaging, and indeed, in the Arsenal the conservation efforts reflect the determination and grit of workers who have a deep love for nature. However, context matters, and in the case of the Arsenal, some restorative efforts have been known to obscure aspects of the site despite attempts to retain some of its military history (Havlick 2018). In the following section, I argue that the Arsenal has become a simulacrum, depicting cultural notions of wilderness, that undermines the reality of human intervention and interaction in the site and that shapes the Arsenal's nature. This simulacrum has been created by the endangerment narrative, as the need to protect wildlife and educate the public resulted in the establishment of tours and recreational use. This simulacrum becomes indistinguishable from the original "wilderness," which leads to the hyperreality of the site's environment; that is, the simulacrum is being favored over the original.

One can observe the constructed nature of the wildlife refuge through the multi-layered interactions that animals and people have, which produce a hybrid state between domestication

and wilderness. While the tour guides underline the wilderness component of the site, the fact is that animals are subjected to severe human monitoring. Dennis, who knew the Arsenal well, discussed his concerns over conservation management:

The concern would be honestly the animal populations that are there [that are] not artificial because there are animals that come down like coyotes and deer [...] The ferrets and the bison have the biggest controls on them [...] I think they are the most hands on. So, it wasn't so much like a concern [at the time] for how people were managing it, it was just a concern for like the fluctuations you would get within any wild population (Interview with Dennis, November 5, 2019).

In this excerpt, Dennis explains how certain animals were monitored in fear that their populations would end up being too low. Although he mentions that the relationships between animals and humans are not artificial due to the mobility of the animals within their confinements, the black-footed ferrets and bison are controlled in a way to reduce the natural “fluctuations” that a wild population would typically exhibit.

Not only has life been protected in these lands, but also new wildlife has been reintroduced. During the tours, the employees would explain that the reason for reintroducing animals, such as the black-footed ferrets and bison, was that they used to be native to the land. As Krupar points out, the reintroduction of bison “nourishes an ecological fantasy of restoring native wilderness” (Krupar 2013, 54). While reintroducing wildlife is a typical conservation strategy backed up by a scientific explanation, these species became part of the creation process of the Arsenal as they were meant to represent the original populations that once existed. As the notion of simulacrum implies, it is difficult to tell the difference between the copy and the original. Despite the genetic purity of the bison at the Arsenal that establishes them as being wild, they have been reintroduced through human intervention. When wildlife is seen as being completely wild and meets our expectations of wilderness, it can be easy to forget the human

factors that allow them to thrive in the first place. Approaching these conservation actions through educational practices and entertainment purposes augments the simulacrum of the site and reinforces the idea of complete wilderness.

The “nature” contained within the boundaries of the Arsenal is not very reflective of today’s prairie ecosystems. The landscape contains high dense amounts of wildlife species, and it is one of the few places in Colorado to exhibit xeric tall grass. In addition, it is a land that has been heavily impacted by human presence. Although these traces are difficult to perceive, much of the infrastructure from the Army era has been dismantled or is hidden within the landscape. Havlick has studied naturalization in the Arsenal, as the landfills that house the remaining contamination are now mounds that can easily be interpreted as natural land formations (Havlick 2018). Other physical features of the Arsenal’s past have been either removed or remain as obscure landmarks. For instance, Havlick notes that many residents from the Montebello neighborhood nearby still remember when the USFWS took down the Army’s original security gates (Havlick 2018). One of my interviewees mentioned that the USFWS did this mainly because “it came from the Army and it wasn’t great and it was old school and scary looking” (Interview with Dennis, November 5, 2019).

Another occasion when I noticed the past being obscured by the landscape was when I visited the Arsenal with one of my informants who was previously involved in the water treatment. We set out to find the water treatment wells on the North side of the refuge, and it took us a while to realize that the inconspicuous small structures that looked like barrels lining along the fence were actually part of the Arsenal’s water remediation program that extracts contaminated groundwater and treats it. These examples show how many aspects of the landscape that once used to reflect the presence of the Army have been lost over time.

In the meantime, the USFWS's new mission has put in place a new infrastructure that highlights the Arsenal's evolved status as a space of contained wilderness. The Visitor Center is probably the most informative building, as visitors are exposed to both the Arsenal's present and past. Many of my informants agreed that the Visitor Center displays a wide variety of historical aspects of the refuge and provides an overview of its history and its military past. One of my informants, Robert, a researcher who has studied the Arsenal, mentioned that the current Visitor Center replaced an older one that was in an Army's officer quarters. In explaining the differences between the two, he stated:

When they moved to the new Visitor Center, I think they foregrounded a little bit more the wildlife portion and there was a little bit of a loss of the military, uh, component [...] You walk in that Visitor Center and the first thing you see is that big stuffed bison and the kind of panoramas and dioramas of wildlife and then now there is that black-footed ferret exhibit out back. So, I think it is certainly possible to go to the Visitor Center and come away, again, feeling primarily like this is a wildlife refuge, you know, for nature. (Interview with Robert, December 2, 2019).

Robert noted that the new Visitor Center prioritizes the wildlife aspect as seen through the wide array of exhibit objects around the building. When one walks into the Visitor Center, one is greeted by dioramas of prairie dogs and bison as well as panels introducing the place. The exhibit begins with the archeological record; then there is information about the farming settlers; next, the military presence is explained; and finally, the panels address the creation of the refuge. The exhibit appeals to different senses: as you approach the panels, an audio recorder plays divergent sounds from bird chirping to bombs falling. Furthermore, visitors can dress up as farmers and touch the coats of coyotes and bison. Considering the chronological organization of this narrative, the overarching story becomes one of progression, illustrating how contamination is framed as a past event. In this way, it is interesting to note the cyclical structure of the Visitor Center; no matter where you start, you will always end the exhibition with an animal diorama

display. If you move through this physical space following the proposed chronological order, you will end with the dioramas of coyotes and mule deer; meanwhile, if you start the exhibition from the opposite direction, you end with the diorama of the prairie dogs, and black-footed ferret. Thus, the physical space is subtly prioritizing wildlife through the structure of the exhibit.

The wildlife loop is another feature of the physical space that can obscure the past while promoting the refuge narrative. This loop can be accessed from various roads, enabling visitors to enter the refuge without passing by the Visitor Center. As Havlick (2018) has mentioned in his research, although the Visitor Center displays a good overview of the site's history, many people do the self-guided wildlife drive tour without stopping at the building. As a result, many visitors are not interacting with the exhibits that depict the Arsenal's history (Havlick 2018). Meanwhile, the loop was created primarily for wildlife sightseeing so visitors could get easy access to the animals. These aspects of the landscape illustrate how wildlife has played a major role in the way the physical space has been modified. With the emphasis on wildlife, the human-made nature of this wildlife refuge can easily be overlooked. The way that visitors will experience and interpret the landscape is not only due to the wildlife, but also due to the ways humans and animals are interacting.

Human and Wildlife Interactions

One of the main goals of USFWS is to engage people with the animals. In the end, the educational experiences bring people closer to wildlife. During these experiences, people are interacting with wildlife in ways that are not common in nature, as people experience wilderness

in areas that have been heavily modified by human intervention. These close interactions with wildlife are staged as a spectacle that becomes part of the simulation process.

One example of the theatrical dimension of human and wildlife interdependence is the buck tours offered in the fall. The main objective of these tours is to drive through the Arsenal in order to photograph bucks during the rutting season. When the tour started, we were introduced to the life cycle of mule and white-tailed deer through a 10-minute presentation. During this presentation, the speaker mentioned that there was a buck with an impressive set of drop tine antlers that captured the attention of photographers from all over the country. Interestingly, this buck was given the name of Maximus, and had the status of a local star (see appendix C, figure 3).

It was clear that the tour targeted certain bucks, as we searched for the ones with the most impressive set of antlers. We managed to find Maximus, as we were driving along the wildlife loop. Because he was difficult to see from the road, the tour guide decided to enter a closed off area to get a better angle of the buck and to take photographs. Just as we reached the gates to this section, we were greeted by a group of fellow photography enthusiasts who were blocking the gate with their cars. Most of these people were stationed near the edge of the gate, aiming their cameras at Maximus and patiently waiting for a clear view of him. As we entered and positioned ourselves at the perfect angle, I found myself as enthralled as the others and spent around twenty minutes taking photographs of this one particular animal. While the tour did emphasize the education of the public about these deer, it was also clear that entertainment is a fundamental aspect of the tours. For wildlife enthusiasts, myself included, there is something alluring and utterly fascinating about viewing closely the wildlife.

The interest in these animals can lead to people getting close to wildlife in ways that can result in their humanization and domestication, as seen through the black-footed ferrets. These ferrets were not only reintroduced in 2015, but they can now be seen more frequently in the Arsenal than in the wild. Black-footed ferrets are quite elusive due to their foraging strategy, which consists of hunting prairie dogs in their burrows, making them quite difficult to be found in the wild. Nonetheless, the Arsenal has one of the few black-footed ferret exhibits in the nation (known as the Ferret House), which showcases one or two black-footed ferrets. The exhibit is open most days of the week, although it is still hard to see the black-footed ferrets even in their enclosures because they spend most of their time within their secluded dens. The only time that one can truly admire these creatures is when they are being fed. In the tours, food was placed in strategically difficult spots for the ferret to demonstrate its prowess to the watching public, as it would dynamically climb and twist through tubes and small obstacles. Children in the tours would exclaim in amusement as they watched the ferret struggle to get the food, and a girl was even disappointed to hear that they would not be able to hold these ferrets.

The black-footed ferrets in the exhibit come from captive breed programs and are considered as being “retired” due to either their age or their impaired abilities to survive in the wild. The rest of the reintroduced black-footed ferrets also come from captive breeding programs. Before ferrets can be released back in the wild, they go through what tour guides call “ferret bootcamp.” Essentially, the ferrets experience a series of tests for a minimum of 30 days to examine their abilities to survive in the wild. During a tour, the guide explained that in the captive breeding program, they created an owl model and placed it over the burrowing colony to simulate owl predation. If the ferrets ducked back into their burrows once they saw the owl’s shadow, they would gain more points towards passing their physical exams, thus increasing their

chances of being reintroduced. As part of the program, these ferrets are also exposed to natural burrow systems, are fed live prey, are vaccinated, and experience a series of pen-rearing activities that would enrich their natural behaviors and increase their chances of survival. Our notions of what is “wild” and “domestic” become blurred, as human actions determine what makes an animal “wild” enough. In these lands where the original populations have become extinct, these new populations depend on people. In the case of black-footed ferrets, humans need to train wildlife to be wild and to avoid their extinction. Other efforts have been undertaken to ensure the survival of the reintroduced ferrets in the Arsenal, such as cutting down trees to discourage owls from hunting down the black-footed ferrets.

The tours establish a connection between wildlife and people that further accentuates the Arsenal’s hyperreality. One of the reoccurring activities of the ferret tour is to dress up a visitor, particularly a child, as a black-footed ferret. The tour guide would ask for a volunteer, and then dress up the individual by giving them green sunglasses (to represent the eyeshine of ferrets), a hairband with two glued cotton balls (for ears), a black mask, a black vest, and two black gloves (to represent the coat pattern). The association between people and wildlife, in some cases anthropomorphic, occurs in multiple ways. During the tours, I have heard phrases passed around like “going home to the ferret house” (Visit 7 2020), “ferreting something out” (Visit 3 2019), “she got the eyes of an eagle! Literally” (Visit 8 2020), and black-footed ferrets are “picky eaters” (Visit 2 2019). The domestic nature of the Arsenal that is loved by visitors becomes a hyperreal space, one in which human involvement and interaction is not fully acknowledged but is yet favored over how wildlife would typically act in the wild. As Eco argues, hyperreality works successfully when “the customer finds himself participating in the fantasy because of his

own authenticity as a consumer” (Eco 1986). In the Arsenal, visitors are encouraged not only to prefer the simulation over the real, but also to interact closely with it.

Wildlife is vulnerable to humans, but as the Arsenal shows, some nature is cared for by humans in order to survive. The environmental narrative shows that humans are at fault for their endangerment but does not linger in this blame because at the same time humans have the power to protect these species. Although many of my participants agreed that the Arsenal does not pose a threat to humans, it is still a place with contamination that is difficult to spot. The wildlife becomes part of the simulacrum of the site. The visitors experience wildlife through a barrier, whether it is looking at black-footed ferrets in their enclosures, looking out of the bus window at the prairie dogs, observing bucks through a photographic lens, or watching eagles through binoculars. In the end, certain aspects of wildlife tend to be preferred over others, such as being able to observe retired black-footed ferrets in person, despite the fact that they are not in the wild; photographing impressive deer that are so used to people that they no longer run away; and finding the location of a bison herd, which is predictable because the USFWS constantly rotates the herd through different corrals to avoid overgrazing.

Chapter Five: Conclusion

By analyzing the wildlife at the Arsenal, one can discover a network of social meanings and cultural ideologies about the environment. This thesis expands on the previous scholarly work done at the Arsenal, especially Krupar's research, in order to look at the way animals act as conduits saturated with meaning. When animals are seen as signs, we are able to take one step closer to comprehending the web of sociopolitical interactions, which has implications in places such as the Arsenal. In this case, wildlife went from being a sign of toxicity, as seen through the duck, to a sign of protection and cleanliness, as seen through the bald eagle. Within the framework of education and the endangerment narrative on the site, the representation of wildlife has aided in the construction of a hyperreal space that exists today. In this space, visitors have close interactions with wildlife facilitated by the agencies on the site, which obscures the social history of the Arsenal.

It is not the intention of this analysis to lead the reader astray into thinking that the Arsenal is a covert operation riddled with conspiracies. On the contrary, the people that I have met show an admirable passion for the Arsenal's wildlife and make valiant efforts to inspire the public to cherish an endangered landscape. Uncanny as it may seem, the idea that wildlife is threatened more by habitat and resource depletion than due to toxic waste shows humankind's drastic impact on the environment. Being nowadays surrounded by newly developed suburban neighborhoods, the Arsenal has truly become an exceptional spot for wildlife.

However, it is important to take into consideration that with these types of conversions and novel narratives around wildlife, there are implications in the way we remember these landscapes. Because of wildlife, the Arsenal has transitioned into a refuge. With the education

programs in the Arsenal, there is an inevitable detachment from the idea of contamination that is securely buried underground. Thus, it is important to be aware that our notions of wilderness can obscure a significant aspect of human history as well as the current modifications that humans continue to make on the landscape.

The Arsenal was one of the first military sites to transition into a wildlife refuge, becoming an environmental model for other places that share a past of contamination due to intensive wartime industry. For instance, the Rocky Flats National Wildlife Refuge is only thirty-five minutes away from the Arsenal and has previously produced plutonium for the Cold War. Like the Arsenal during its cleanup in the 1980s and 1990s, Rocky Flats is currently the subject of controversy and skepticism as its true danger is essentially unknown. In the Arsenal, there are low risks for a citizen to be exposed to harmful contamination, while in Rocky Flats, the risks are controversial. It is clear in both cases that the approach to convert these lands has become a successful initiative, which raises the question, is this the right approach for the Rocky Flats as well as for other sites around the nation? Whatever the answer may be, wildlife should be considered as a powerful agent in these conversions.

While this study solely focused on the way the Arsenal's narrative originated and is currently being framed, it did not take into consideration how the visitors understand wildlife at the site. Although the Arsenal has been extensively studied by various scholars, it would be insightful to study how visitors are interpreting these wildlife signs currently and whether these signs are efficiently working.

Appendix

Appendix A: Interviews conducted (sorted by date)

Sullivan. Interview by author. Audio recording. Main Boulder Public Library, September 25, 2019.

Louis. Interview by author. Audio recording. Louis's place of residence, October 23, 2019.

Dennis. Interview by author by Skype. Audio recording. November 5, 2019.

Ronald. Interview by author. Audio recording. University of Boulder Colorado Campus, November 22, 2019.

Robert. Interview by author by Skype. Audio recording. December 2, 2019.

Sarah. Interview by author by Skype. Audio recording. December 3, 2019.

George. Interview by author. Audio recording. University of Boulder Colorado Campus, December 9, 2019.

Ryan. Interview by author. Audio recording. The Rocky Mountain Arsenal National Wildlife Refuge, December 14, 2019.

Tim. Interview by author by Skype. Audio recording. December 29, 2019.

Logan. Interview by author. Audio recording. Amante coffee in Boulder, January 26, 2020.

Appendix B: Field Visits to Arsenal (sorted by date)

Visit 1. I visited the Wildlife Property Repository. September 6, 2019, 2:00 PM - 3:00 PM.

Visit 2. I went on a tour and observed the wildlife on site. September 14, 2019, 9:30 – 11:00 AM.

Visit 3. I went on a tour and visited the black-footed ferret exhibit. October 6, 2019, 10:00 AM - 10:45 AM.

Visit 4. I went to the Arsenal's celebratory event, Refuge Day. October 19, 2019, 11:00 AM - 2:00 PM

Visit 5. I went on a tour and looked for mule deer and white-tailed deer. November 30, 2019, 9:00 AM - 12:30 PM.

Visit 6, I went on a tour and observed the wildlife on site. December 14, 2019, 9:30 AM – 11:00 AM.

Visit 7, I went on two tour and visited the black-footed ferret exhibit. January 18, 2020, 10:00 AM - 10:45 AM.

Visit 8. I went on two tours and looked for the eagles on the site. January 18, 2020, 2:00 PM - 3:30 PM.

Appendix C: Pictures

Figure 1: Arsenal's Visitor Center. Next to the 2011 U.S. Fish and Wildlife Service Environmental Leadership Award and the pictures of the president and vice president, there is a panel with the bald eagle that states that the Arsenal "owes its establishment to generations of Americans who settled the land, defended our nation [...] and, ultimately, transformed this site into a sanctuary for wildlife and people." Photograph by author.



Figure 2: Children artwork hung in the Arsenal, depicting a bald eagle, raccoon, and bison. Photograph by author.



Figure 3: A photograph of Maximus in the Arsenal. It is difficult to see but the drop tine antler is on the bottom left, next to his ear. Photograph by author.



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