

Understanding Linguistic Treatment Across Species: a Comparative Study at Zoo Knoxville

A Thesis Presented for the
Master of Arts
Degree
The University of Tennessee, Knoxville

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May 2024

ACKNOWLEDGMENTS

It takes a village to complete a project of this scope and, as a result, I have many individuals to thank.

To those in the UTK community. For their expertise, guidance, and steadfast support, I am grateful to Dr. Sean Morey, my committee chair, and to Dr. Lisa King and Dr. Jessica Grieser, my committee members. Each of you were indispensable to the completion of this project. I am also grateful to my Herbert Writing Center colleagues for their feedback and time. I give special thanks to Dr. Kirsten Benson, Dr. Anne Snellen, and Dr. Hannah Soblo for their guidance on literature reviews and results chapters.

To Amber Kent-Johnson, Kelly Sauskojus, and Anita Vorhees, I greatly enjoyed our goalkeeping sessions and the sage advice that you dispensed during them. To Michael Sutherlin, my partner in writing, I look fondly on the long hours that we spent working together on the academic giants known as the thesis and the dissertation. And lastly, but certainly not least, I thank my RWL colleagues for listening to my ideas for this project and sharing your thoughtful feedback. You have all shown me that writing is much better when done in community.

Now, I express my gratitude for the mentor, friends, and family members who have accompanied me on this journey. For his consistent support and guidance as I worked towards this degree, I am grateful to Dr. Jonathan Sircy. For her encouraging presence, I am thankful for Ellen Pohl. For braving the mountains of Tennessee to spend time with me, I give thanks to Alvin, Debbie, Fudge, Glow, Molly, Mozart, and Waldo. I also have much appreciation for Arthur, Deborah, Tony, Larry, and Trinti for helping me move to Knoxville and become established in my new home. To my mother, Mary, and grandmother, Shirley, I possess an infinite amount of gratitude. Thank you for being my constant companions.

Now, I express my warmest gratitude to Zoo Knoxville for participating in this study.

I am truly grateful to all who contributed to this thesis' completion.

ABSTRACT

Zoos are unique locations that often bring the natural world into urban settings for the purposes of conducting research, engaging in conservation initiatives, and educating and entertaining the public (Miranda et al., 2023, p. 290). However, the version of nature that zoos construct can be imperfect in that zoos may obscure the reality of their environments and create discrepancies in their treatment of different species. Engaging with environmental communication scholarship that explores how humans consider the voices of nonhuman animals and align animal representations with human interests, I use an ecolinguistic framework to inquire into how nonhuman animals are treated linguistically at Zoo Knoxville in comparison to one another. This comparison is completed in reference to different categories that each animal belongs to: native, exotic, and pest. I also seek to identify the differences between Zoo Knoxville's communication on humans and the zoo's communication on the nonhuman animals in the aforementioned categories as a whole. In order to accomplish this, I analyze zoo documentation, plaques, and signage using the concepts of ideology, framing, salience, and erasure. In doing so, I find that Zoo Knoxville indeed listens to the voices of nonhumans. However, this listening is tempered by the material-symbolic representations that align with zoos' desire to educate and entertain the public and to carry out conservation initiatives and research in a monitored setting. These representations obscure the material reality of the zoo's environment. Zoo Knoxville, as a result, could invest in bringing this obscured reality to the fore.

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Chapter 1: Seeing Animals

Introduction

An early Spring visit to Zoo Knoxville presents a human guest with a range of experiences. There are tickets to be purchased, meals to be purchased from onsite restaurants, and delightful murmurs emanating from the outdoor wetlands classroom.

However, it is the nonhuman animals that primarily attract attention. The North American river otters might draw the guest's eye as they propel themselves around their creek. And, if the guest is lucky, a lounging Western lowland gorilla will acknowledge their stare. The animals housed in exhibits are not the only ones the guest will encounter. As they meander towards the Clayton Family Kids Cove, they might first engage with the largely benign carpenter bees who swarm on the path to the petting zoo.¹

While the zoo abounds with living and breathing animals, a large portion of the guest's experience will consist of linguistic and visual representations. Visual representations serve a variety of purposes, including accentuation for exhibit themes, ways for guests to interact with exhibits, means of recognizing benefactors, and as promotion for products. For example, after the guest steps into the "Barn Loft," they see, among the house mouse exhibit and others representing nineteenth century Appalachian farm life, antique images of cattle, horses, mules, and pigs. If they travel to the center found at the heart of the Clayton Family Amphibian and Reptile Conservation Campus, the guest will behold the names of benefactors as they sit mounted on crocodile, frog, otter, snake, and turtle shaped-plaques. Similarly, the guest's eyes might alight on advertisements for zoo membership that feature chimpanzees. Visual

¹ Carpenter bees are known to cause cosmetic and structural damage. Female carpenter bees are also known to sting. However, this behavior only occurs when female bees are agitated. Male carpenter bees are not known to sting. See Oklahoma State University's page on Carpenter Bees for more information: <https://extension.okstate.edu>

representations pervade the zoo grounds and play a substantial role in creating the zoo's atmosphere and in communicating ways that the guest might relate to the zoo environment.

Linguistic representations of animals are also a significant feature at the zoo. These are particularly integral to the aims of raising awareness concerning conservation crises and initiatives, orienting guests to adopt environmental stewardship practices, and instructing guests on how to navigate the zoo and interact with its animals. The human guest, for instance, may notice a sign at the chimpanzee exhibit explaining that the animals are receiving care from veterinarians. (Therefore, the guest does not need to worry about the apes' health.) Other, more frequent signs notify the guest about animals that are part of a Species Survival Plan (SSP)—plans that manage genetic diversity among captive members of a species. Additionally, some linguistic representations are hidden from the public and exist to maintain the zoo's health standards and professional appearance. These representations can be found in the documentation that dictates the removal of certain species that are considered pest species.

Hopefully it is clear, both to the hypothetical guest and to those reading this thesis, that zoo experiences are grounded in physical interactions with animals as well as in discursive and visual representations of nonhuman animals. Both of these spheres are central to the field of environmental communication.

Scholars in the field have sought to identify and analyze nature's physical interactions, or "voices," as they appear in communicative events (Dare & Fletcher, 2019; Plec, 2012; Rogers, 1998). Additionally, there is agreement in the field that "environmental problems are both materially produced—through interactions between human actions and bio-physical processes—and are also socially or discursively constructed" (Cox & Depoe, 2015, p. 15). Therefore, humans also understand nature through the symbols and representations that

interested parties produce. As a result of this latter observation, analyses of discourse and visual communication constitute many of the studies in this field and range from critical analyses of factory farm discourse to visual analyses of environmentally-themed Getty Images (Glenn, 2004; Hansen & Machin, 2008; Marafiotte & Plec, 2006).

But while many of these studies center on interactions with, and industries related to, nonhuman animals, few studies specifically center on zoos and their communication concerning the diverse species that either inhabit or migrate to their grounds.

Perhaps two studies by Tema Milstein come closest to examining human-animal related communication in this context (Milstein, 2009a; Milstein, 2012b). Milstein's first study, which analyzes the discourse of zoos and contextualizes zoo discourses within dominant Western ideological environmental dialectical discourses, remarks on inconsistency between exhibit design and conservation messaging (Milstein, 2009a, p. 26). She, for example, notes a discussion of the rising human population, and subsequent habitat destruction, that takes place near an African Savanna exhibit at a prominent urban zoo in the American West:

Just a few meters away, guests enter the "African Savanna" where they can see abundant giraffes and other savanna animals roaming outside the walls of a one-room African primary school. This representation presents an Africa where rising populations have had benign, if any, effect, and where people live in small, self-sustaining villages in close, harmonious proximity to abundant wildlife. (Milstein, 2009a, p. 37)

In a later chapter, Milstein contributes to both the conversation on hearing nonhuman "voices" and to the ongoing conversation on material-symbolic discourse, by observing the discourse surrounding a gorilla exhibit. Here, she finds a struggle over meaning as guests and keepers

apply different cultural lenses to gorilla actions (such as banging on the exhibit glass) (Milstein, 2012b, p. 163).

Due to the dearth of studies surrounding discourse and nonhuman animals at zoos, this thesis analyzes zoo communication surrounding species from three categories of nonhuman animals with the aim of understanding the similarities and the differences in the discursive trends surrounding them. The categories of nonhuman animals are as follows: those recognized as being exotic, those recognized for their nativeness, and those viewed as pests. For the study undertaken in this thesis, the species include: western lowland gorillas (exotic), red wolves (native), and German cockroaches (pest). Each category was created by myself with the intent of capturing species that inhabit the zoo's grounds in different capacities. These include those that occupy the environment as a part of the zoo's collection but are native to the United States, those that occupy the environment as a part of the zoo's collection but are not native to the United States, and those that are viewed as being pest species on the zoo's grounds.

The second aim of this study is to provide an understanding of the discursive elements surrounding each species in relation to those surrounding humans. This aim holds importance because it distills, in the context of zoos, the ways in which humans are held in relationship to nonhuman animals. The implications of similarities and differences between humans and nonhumans have been explored more extensively by some in the field. Susannah Bunny LeBaron, in particular, brings attention to the human habit of situating ourselves and other animals on a hierarchical scale—with ourselves being superior and the most unique (LeBaron, 2012). Milstein also notes, in the chapter discussed above, that humans use some animals as a mirror to analyze ourselves and our own society (Milstein, 2012b). Ultimately, documenting similarities and differences in communication on humans and nonhumans contributes to the

understanding of how we view ourselves in relation to the animals listed in the three categories specifically and to the animals inhabiting zoos in general.

Rooted in environmental communication and ecolinguistics, an ecologically-oriented branch of critical discourse analysis (CDC), this thesis has five chapters. I begin here, in Chapter 1, by introducing relevant theories from environmental communication—which includes a discussion of the field’s material-symbolic orientation and the mediation frameworks that exist within it— and then by connecting them to the subfield of ecolinguistics. In Chapter 2, I describe the methods by which I conducted this study. I examine the results of the study in Chapter 3, and then in Chapter 4, I amalgamate the underlying similarities and differences that I discover and discuss their significance. Finally, in Chapter 5 I discuss the implications of my findings within the context of the zoo and offer directions for future research.

Literature Review

Jennifer Peebles notes:

the complexity of environmental problems, with their intricate connection to the material, cultural, social, economic, political aspects of our lives, invites scholars to bring diverse conceptual, theoretical, and methodological frameworks to the task of understanding and mitigating these expansive concerns. (Peebles, 2015, p. 39)

Peebles’ statement also holds true for scholarly attempts to both care for and acknowledge issues surrounding the lives of nonhuman animals.

As discussed above, the studies that are most relevant to this thesis have followed two theoretical programs: mediation theory and the material-symbolic understanding of environmental communication that has characterized much work in the field. Mediation theory refers to both the mediation of nature through communication and the practice of attuning to

nature's "voice." The material-symbolic approach seeks to identify the myriad of ways that humans shape the environment through discourse (Milstein, 2009b, pp. 346-347). I will elaborate on these two approaches in the first half of this literature review. In the second half, I will introduce and discuss ecolinguistics, an offshoot of critical discourse analysis that has been the avenue favored by a few scholars in the field for interpreting the discourse mentioned above.

Mediation Theory

Mediation theory has allowed scholars to explore the ways that humans and nonhuman animals collectively influence communication events. Historically, environmental communication has not recognized the collaborative work that characterizes some human communication about nature—preferring instead to solely focus on humanity's role in the event and also maintaining doubt that human collaborators can rightfully interpret the work of the nonhuman collaborators (Rogers, 1998). As a result of such anthropocentric practices, the communicative efforts of the nonhuman world have been relegated to the margins of communication-oriented fields, such as communication studies (Plec, 2012).

In 1998, Richard Rogers famously addressed this issue by criticizing constitutive theories for their treatment of nature as a mute, pliable object. He agrees with such theories in that we construct our reality through the use of symbols, but he disagrees with their othering of nature. As a corrective measure, Rogers instead argues for a "materialist, transhuman, dialogic theory of communication" that holds space for the input of natural processes, acknowledges the embodiment of humans and our habitation in an independent world, enacts ways of listening to nonhuman and non-centralized voices, and that replaces exclusionary boundaries with dialogical relationships (Rogers, 1998, p. 268). This theory of communication encourages more dynamic

interpretations of the natural world to emerge and simultaneously dampens the mischaracterization of the natural world as inactive.

Donal Carbaugh (1999) notes a specific instance of listening that occurs among members of the Blackfeet Nation. In this culture, listening refers to looking for the sacred in surroundings, whether they be historically and culturally significant or the seemingly mundane background of everyday life. Listening also means being attentive to one's surroundings. Animals, plants, and other elements of the natural world can be consulted as sources of inspiration due to the tribe's belief in the agency of the nonhuman members of the world. Specifically, "people, animals, rocks, and trees are actually co-present and co-participant with people as embodiments of the spirit(s) in the world" (Carbaugh, 1999, p. 259). Listening to one's surroundings at the intersection of the historical, the spiritual, and the interconnectedness of life brings a better understanding of one's own place in the world (Carbaugh, 1999, p. 260).

Continuing this vein of research, Tracy Marafiotte and Emily Plec (2006) highlight the role of hybridity in informal discourse about the natural world. When discussing the environment, individuals will often feature different interpretations within their speech. Discourses that may emerge include anthropocentrism, romanticism, ethnocentrism, and ecocentrism. Using a multitude of orientations in their speech allows speakers to bridge their "experiences, ideologies, needs, and desires" (Marafiotte & Plec, 2006, p. 68-69). The hybridity that results from such entanglements, the authors argue, offers environmental communicators a means of analyzing public discourse and the ideas that find the most purchase within different groups. A thorough understanding of these utterances also contributes to environmental communicators (both scholars and practitioners) being better able to contribute more constructively in conversations. Specifically in terms of mediation theory, this means that

individuals will be better able to work on discouraging a sense of detachment from the nonhuman world that speakers may have. In place of detachment, a sense of interrelatedness may be fostered (Marafiotte & Plec, 2006, p. 71).

Donal Carbaugh (2007) continues this theme again by, similarly to Rogers, giving an outline of specific practices that individuals should follow in order to include the earth in their communication. The acronym that he develops is “E.A.R.T.H.” The letter “E” is issued to stand in for earth and the environment and their dual significance as corporeal entities and as entities constructed through human language. The “A” of the acronym means that environmental communicators should be actively responsive to the needs of the earth and its people. The “R” stands in for responsibility, which environmental communicators have to the earth and its people. Specifically, the “R” references recognizing that while we speak about the earth, we must also listen to it. “T” is highlighted to represent time. In order for research to become more effective and to avoid reactionary responses, time must be given in order to gain a deeper understanding of an issue. Finally, “H” is synonymous with heuristic explorations. Such explorations offer environmental communicators advantageous new understandings while also assisting them with planning how to move forward (Carbaugh, 2007, p. 72).

Emily Plec (2012) takes up the challenge that Rogers and Carbaugh have issued by organizing the edited collection *Perspectives on Human-Animal Communication*. In the introduction, Plec notes that most studies regarding communication maintain an anthropocentric stance. The aim of this collection is to assist readers, from all backgrounds, with rethinking the role of communication in transforming human-nonhuman relationships (Plec, 2014, p. 2). Thus, Plec mirrors Rogers in explaining that relationships between these two parties must become dialogical in nature. Plec specifically notes that humans must also acknowledge embodied

rhetorical energy. Rather than solely centering communication studies around language, humans must also acknowledge the rhetorical energy (such as emotion, glance, and motion) that is already present in humans and in nonhumans.

A staple of Plec's collection, Deborah Cox Callister's chapter on the rhetoric surrounding whale beachings illustrates the process of nature being mediated by humans. Callister notes that for her own study "We might think of discursive representation of human/beached whale encounters in terms of the degree to which they have traveled from the point of solely material articulation" (Callister, 2012, p. 39). Discursive representation emerges as a result of the whales beached bodies, and it is shown that depending on human interests, the event gets transcribed in different forms (i.e. according to the military's agenda to continue sonar testing or in accordance with activists who desire to protect the whales). The whale's decaying or dying bodies permeate into the sphere of human communication by providing either an inconvenience or a warning sign. The weight of the discourse surrounding the whales who are beached in relation to military sonar testing eventually leads to the harmful effects of the military's practice being recognized by the United States government despite initial reluctance.

In the same collection, Shana Heinrichy (2012) discusses the relationship between violence to animated animal bodies on television and violence to real nonhuman animal bodies. Specifically, she discusses the children's television show *Spongebob Squarepants* and its potential relationship to factory farming. Animation in the United States is described as creating cartoon animals that are cute and subservient and as promoting human interests (Heinrichy, 2012, p. 80). Humanity's ability to maintain control over how nonhumans are characterized is an exercise of power that can compartmentalize the harm that happens to nonhuman bodies, specifically in the food industry so that it appears insignificant (Heinrichy, 2012).

Lastly, Tony E. Adams' contribution to Plec's 2012 collection illustrates both the process and potential effects of humans using animals as media. Adams calls to attention three situations where humans use nonhuman animals as a vehicle for sharing their messages: dogs being used to promote political messages, penguins being used to both promote or resist messages about the naturalness of homosexuality, and finally, what should happen to those who come illegally into the country. Adams notes that two dangers arise in the practice of using animals as vehicles. The first is that the animals themselves will be blamed for the messages that they bear, despite their innocence in this imbrication. Secondly, in an inverse of the former situation, humans will unintentionally be affected by descriptors of animals that parallel language that is associated with humans. This latter example appears in the call to eliminate illegal species that are not "native" to the country.

Mediation theory, in the end, has a nuanced history in the field of environmental communication that overwhelmingly seeks to identify and promote representations of nature that are true and that are not harmful.

The Material-Symbolic Approach

One basic assumption held by environmental communication scholars is that communication influences humans' perceptions of the material world and that the material world influences human communication. This approach has been deemed the material-symbolic approach to discourse. Milstein, in the following example, illustrates how this approach operates in relation to the natural landscapes of the global West. She notes that: "the symbol, or metaphor, of *environment* is not only shaped by material and symbolic Western historical and contemporary relationships with nature, but also helps to shape our contemporary ideas of, and actions towards nature" (Milstein, 2009b, p. 346). The term *environment* has allowed humans to forge a chasm

between themselves and the larger natural world. As this term is continually referenced by others, *environment* is able to continue to perpetuate pre-formulated ideas of separation. This perpetuation can be carried out through a variety of technologies, such as film and photography (Cox, 2007, p. 12).

Cox (2007) elaborates on this widespread understanding of environmental communication by noting that human communication is *interested*. When humans communicate, they draw from the “social locations, perspectives, aspirations, and objectives” that they are connected to (Cox, 2007, p. 13). Because of this, a multitude of orientations to the natural world exist and contest for dominance. Institutions and their ideological moors also play a role in perpetuating particular environmental perspectives as they amplify some features of the natural world and downplay others. Mining corporations, for instance, might cite the importance of humanity’s flourishing even if it comes at the expense of biodiversity and issue the following rhetorical questions and justifications: “Why preserve a mountain? Surface mining equips a multitude of individuals with jobs. Aren’t those individuals more important?”

As a result of the critical and interwoven nature of material-symbolic communication, many scholars have directed studies at identifying, critiquing, and raising awareness about the production and circulation of views of the natural world (Milstein, 2012a, p. 162). Many analyses center on institutions that engage with animals. Several are discussed below.

In a seminal work, Milstein (2011) examines identification practices surrounding orcas in the Pacific coast region. As a result of whale watching tourists finding a connection with the orcas through the acts of pointing and naming, Milstein states that “acts of pointing and naming generate certain kinds of ecocultural knowledge that constitute aspects of nature as considered,

unique, sorted, or marked” and describes these as basic steps to “socially discerning and categorizing parts of nature” (Milstein, 2011, p. 4). This mode of interaction has transformed both personal and institutional experiences regarding the Southern Residents. “Naming” orcas through the use of unique letter and number combinations (which begin with the letter of a whale’s matriarchal pod) has allowed scientists to understand that the Southern Resident population was diminishing as well as to pave the way for further recognition of orcas as individuals. Similarly, naturalists help tourists to engage with the orca population by connecting whale traits and culture with that of humans. This can take the form of noting that orca saddle patches are unique to each whale like fingerprints are to humans (Milstein, 2011, p. 10).

Broad (2016) undertakes an analysis of animal agriculture’s “agricultural interference” or “farm protection laws,” which are designed to prevent animal rights activists from taking photographs and videos at sites of operation. These laws, which are termed “ag-gag” laws by their opponents, threaten animal agriculture mired in factory farming by notifying the public of knowledge that has been obfuscated by the industries and by encouraging individuals to reduce their support of such industries. Broad’s engagement with the material-symbolic approach is to analyze the effects of storytelling, specifically how the “interplay between storytelling practices and underlying value systems functions to shape what we conceive of as knowledge or non-knowledge within the contemporary industrial food system” (Broad, 2016, p. 50). Broad uses the agricultural laws to highlight different forms of ignorance that arise through the stories that individuals tell as a result of their affiliations. Those in favor of proposing such laws, for example, state their confidence in the industrial food system and explain that the public should not be made aware of its inner workings, but should instead place their trust in industry

professionals. As opposed to professionals, who are portrayed as knowledgeable and striving to meet the needs of society, animal rights activists are portrayed as being self-interested. Broad ultimately brings to the fore the interested positions involved in the debate surrounding “agricultural interference”/ “ag-gag” laws and the dominant stories that emerge from them.

Lastly, Morey and Crider (2020) examine the relationship between humans, animals, and the environment by investigating “hyperanimals”—nonhuman animals that have been entered into the digital landscape in both a physical and psychological fashion (Morey & Crider, 2020, p. 289). Rooting their analysis in *Pokémon Go*, which was inspired by the creator’s childhood spent capturing insects (that is, until the encroachment of urban life resulted in dwindling insect populations), the authors come to an understanding of what it means to create an electronic replication of those inhabiting the natural world. Morey and Crider reach the conclusion that *Pokémon Go* possesses the power to bring attention to the importance of ecosystems, spark interest in the well-being of nonhuman animals that occupy those systems, and ignite concerns about biodiversity (Morey & Crider, 2020, p. 303). However, this use of the material-symbolic approach also risks a drive to identify and then subordinate nonhuman animals.

With its attention directed to the ways that human communication mediates the natural world, the material-symbolic approach mirrors mediation theory, an environmental communication framework that seeks to include the voices of both humans and nonhumans in the field’s discussions.

An ecolinguistic methodology, which is discussed below, complements these approaches by contributing an in-depth understanding of the linguistic trends that result in different portrayals of nonhuman animals (and humans).

Discourse Analysis

Analysis of discourse centered on the environment is, no doubt, central to the field. Communicators, therefore, adopt a plethora of approaches for analyses. One method that those in the field of environmental communication have congregated towards is discourse analysis. As noted by Peeples, discourse analysis combines roots “in linguistics, philosophy, and sociology” and “examines the socially constructed meanings and relationships found in language” (Peeples, 2015, p. 44). There are several approaches to discourse analysis.

One of these is ecocritical discourse analysis, which is used by Anastasia Stamou and Stephanos Paraskevopoulos (2004) in their lexical analysis of ecotourism and its depiction of the natural world. Lexical analysis holds that through vocabulary different discourses are able to be identified. The authors apply this tool to the discourse surrounding Dadia forest, a Greek reserve that is growing in popularity, to analyze the contents of guests' books according to notions of the natural world, such as broad terms “pleasure” and “approval” and narrow terms “wilderness” and “diversity” (Staumo & Paraskevopoulos, 2004, pp. 111-112).

Another style of discourse analysis in use is cultural discourse analysis. This form of analysis sees communication as being an emplaced action that “includes the deep meanings being both presumed for and created in that very action” (Carbaugh & Cerulli, 2013, p. 8). Communication exists as part of a system. In this article, the authors utilize this framework to emplace environmental communication and to hold space for both “cultural” and “linguistic variability” (Carbaugh & Cerulli, 2013, p. 4). The study centers on the analysis of discourses of dwelling and of early-onset hunters.

Anders Hansen and David Machin combine visual analysis with critical discourse analysis (CDA) to engage with multimodal critical discourse analysis. Critical discourse

analysis, which is concerned with issues of power and the dominant scripts featured in texts, has traditionally been applied through linguistic analysis (Hansen & Machin, 2008, pp. 779-780). However, the two authors incorporate Kress and Leeuwen's *Grammar of Visual Design* (2021), a manual of visual analysis, into their study of the environmental messages of Getty Images in order to systematically explore images in the same way that traditional CDA has analyzed linguistic text.

While the field has widely embraced discourse analysis, specifically critical discourse analysis, it has given considerably little attention to ecolinguistics. There has been little cross pollination between scholars of these similar, but separate fields (Milsten, 2012a, p. 168).

Ecolinguistics, like mainstream critical discourse analysis, is concerned with issues of power. However, for ecolinguistics the scope of that concern has been narrowed to focus on ecologically destructive discourses. (Noticeably there are two varieties of ecolinguistics. One focuses on how language variability is dying. The other, which is mentioned above, discusses ways to protect the natural world through language.) Additionally, ecolinguistics instructs us on how to find more life-affirming ways to speak about the environment. Ecolinguistics borrows from the fields of linguistics and cognitive science in order to identify the narratives that guide our thoughts and actions (Stibbe, 2015, pp. 1-2).

One article that discusses ecolinguistics, which was featured in the journal of *Environmental Communication*, is Robert Poole's (2018) "Ecolinguistics, GIS, and Corpus Linguistics for the Analysis of the Rosemont Copper Mine Debate." The article utilizes linguistics in addition to corpus linguistic techniques to analyze an environmental debate that takes place in Arizona between a mining corporation and environmental lobbyists to map place names and representations amongst the two groups.

Another article in *Environmental Communication* engages with ecolinguistics. Written by Brigitte Nerlich and Nelya Koteyko (2009), this article uses elements from frame analysis and lexical pragmatics embedded within an ecolinguistics framework to analyze language on the websites of Carbon Rationing Actions groups with the press coverage surrounding them. The authors further explain their use of ecolinguistics by noting that they wish to “contribute to the field of ecolinguistics by examining a special type of lexical creativity, compounding, in the domain of environmental activism, using a new movement, namely CRAGs, as a case study” (Nerlich & Koteyko, 2009, p. 220).

Lastly, Tema Milstein has frequently discussed ecolinguistics in her work. Milstein is one of the only environmental communication scholars to center ecolinguistic analyses around nonhuman animals. In her 2011 article on the behavior between naturalists and tourists who experience whale sightings, Milstein considers the voices of other scholars, noting that Stibbe “focuses at the ecolinguistic scale on Western lexicon’s tendency to identify animals by mass instead of plural nouns, framing some animals as simply a unit standing in for a larger homogenous category” (Milstein, 2011, p. 5). Equipped with whale identification strategies, such as alphanumeric identifiers, whales could be perceived more clearly as individuals rather than en masse.

Finally, in a 2012 study Milstein incorporates ecolinguistics into her analysis of zoo keeper-to-visitor communication surrounding a gorilla exhibit at a zoo in the West. Her framework for this study includes “discourse, ecolinguistics and environmental communication studies, as well as previous work on the humanature dialectical framework of mastery vs. harmony, othering vs. connection and exploitation vs. idealism” (Milstein, 2012b, p. 163).

In my study, I aimed to further this work by framing an analysis of zoo discourse within an ecolinguistic framework. I used an ecolinguistic framework to inquire into how nonhuman animals that can be categorized as being exotic, native, or pests are treated linguistically at Zoo Knoxville. I also utilized an ecolinguistic framework to distill how the zoo's treatment differed between these animals. Lastly, I used this framework to seek the difference between zoo communication about humans in relation to the zoo's nonhuman animals as a whole. Chapter 2 of this study describes my methodology and methods at length.

Chapter 2: An Ecolinguistics Lens

As stated in Chapter 1, this study sought to identify species-based distinctions embedded in Zoo Knoxville's discourse. Specifically, it asked what linguistic differences exist between the treatment of different species of nonhuman animals in zoo communication. On a wider level, this study sought to identify the linguistic differences between the treatment of humans in zoo communication and the treatment of nonhuman animals. Specifically, in reference to nonhuman animals, it asked how linguistic treatment differs across species based on their categorization as either an exotic, native, or pest species. Using a methodology rooted in ecolinguistics, I sought similarities and differences across the following species: the red wolf (*Canis rufus*), western lowland gorilla (*Gorilla gorilla gorilla*), and the German cockroach (*Blattella germanica*). Each species was chosen because it represents a distinct dimension of zoo life. The zoo's red wolf population provided a native species for analysis. Its western lowland gorilla population provided an exotic species. And finally, German cockroaches, which also inhabit zoo environments—despite being unwelcome inhabitants—served as the pest species. Due to the zoo's dual purposes of entertaining humans and educating them about conservation, the zoo environment can accurately be termed a human-dominated space. As this species is central to the zoo environment itself and also has a powerful role in preserving the wellbeing of the natural world, it is necessary for the linguistic patterns surrounding it to also be observed.

Before describing my methods and the concepts that I have used in detail, as well as the institution and species that were central to my study, it is necessary to first revisit “ecolinguistics” as well as describe what a methodology centered around this term entails.

Ecolinguistics is an umbrella term that covers two strands of linguistic research. The oldest of these concerns whether language diversity can exist in a globalized world. Linguistic

diversity is compared to biological diversity, and discussion centers on the relationships between an individual's languages and those languages' relationship to the outside world. The second strand of research explores how language can be used to inflict harm or bring restoration to the natural world (Fill, 2017). It is this second strand that is foundational to this study's methodology due to the attention it gives to the treatment of nonhuman animals as well as to the power structures that enable this, often destructive, behavior.

Ecolinguistics, through its analyses of language's impact on nonhuman animals and the wider natural world, highlights this skill's world-shaping capabilities. Language influences thought, which then proceeds to influence action. In order to identify and curb the destructive forces of language by replacing them with more harmonious discourses, those who have adopted ecolinguistics utilize distinct concepts to locate and diagnose destructive stories. Approaches to ecolinguistics both identify smaller linguistic patterns (as Goatly and Trampe do), as well as discuss the larger constructs that they contribute to (as Stibbe does in his discussion of story forms). Specifically, Trampe explores the role of euphemization in masking the killing of nonhuman animals (such as calling the genocide of an animal species its "dying out"), Goatly analyzes how a statement can be understood by different parties as either being true or metaphoric, and Stibbe contributes a list of eight forms (including ideology, framing, metaphors, evaluation and appraisal patterns, identity, convictions and facticity patterns, erasure, and salience) in which our stories about the environment manifest themselves in (Goatly, 2006; Stibbe, 2015; Trampe, 2017). This methodology's dual focus on human constructions of the natural world and the linguistic elements that comprise such constructions made it ideal for analyzing linguistic differences across the zoo environment and identifying overarching themes embedded in zoo communication.

Deriving from critical discourse analysis, ecolinguistics primarily focuses on written and spoken language. However, it does sometimes address imagery (Hansen, 2017; Hansen & Machin, 2008; Stöckl & Molnar, 2017). The inclusion of imagery is notable because much of this study's data is derived from zoo signage and plaques. The work of Lamb and Stibbe illustrate what it looks like to apply ecolinguistics to objects and visual texts (Lamb, 2020; Stibbe, 2015). In his study, Lamb analyzes signage and the wider discursive infrastructure of a tourist trap in Hawaii. There, discourse about protecting sea turtles moves across sites and when used tethers the speaker to the wider network of wildlife conservation's history and activity (Lamb, 2020). Stibbe takes a different approach when analyzing photographs of farmed animals. Through measuring the level of detail in each photograph, as well as the amount of action individual animals are depicted as taking part in, he hypothesizes whether a viewer would see these creatures as worthy of attention (Stibbe, 2015). Animals may appear to be en masse and to lack individuality, for instance, causing the viewer to feel dispassionate about what is being shown and unable to identify with the animals in the photograph. While this study primarily focused on the discursive allowances of ecolinguistics, its ability to engage with mediums beyond the purely textual ensured that I was able to consider the visual elements of the zoo's communication in the signage and plaques that I analyzed.

In the coming five sections, I describe the ecolinguistic concepts that comprise the framework of this study. First, however, I will introduce its institutional context. Second, I elaborate on my rationale for selecting American red wolves, western lowland gorillas, German cockroaches, and humans as the species of analysis. Third, I describe my materials and the methods that I employed for their collection. And fourth, I describe the concepts that I selected and their connections to ecolinguistics.

Institutional Context

This study was conducted at Zoo Knoxville, an East Tennessee zoo that is home to over 800 animals and is accredited by the Association of Zoos and Aquariums (AZA). As a member of this organization, the zoo is committed to maintaining “a healthy, genetically diverse population in zoos to ensure we don’t lose animals to extinction when wild populations are in peril” (Zoo Knoxville, n.d.-b). Originating in 1948, the zoo is known for facilitating the birth of the first African elephant born in the Western Hemisphere (Haskins, 2007). In addition to this accomplishment, the zoo is the first in the world to have hatched critically endangered northern spider tortoises and is the second to have successfully bred a “second generation of captive-born Arakan forest turtles and common spider tortoises” (Zoo Knoxville, n.d.-c).

The zoo is actively involved in conservation initiatives. On a large scale, this work is in conjunction with AZA Species Survival Plans. These plans seek to establish zoo populations that are demographically and genetically varied as well as biologically sound. If populations are threatened in the wild, these ex situ (off-site conservation) populations exist. Taking a regional approach to conservation, the zoo also works to save East Tennessee’s bog turtle population in addition to conducting research on the area’s hellbenders and mudpuppy salamanders.

Entertainment is another value that the zoo holds closely. As of 2019, records indicate that the zoo has over 500,000 guests per year (Farley, 2019). Primarily, guests are encouraged to enjoy exploring the zoo environment. An “About Us” statement on the organization's website states that it is “committed to sharing ‘wildly fun’ experiences that educate and inspire” and has “acres of creative habitats for animal lovers of all ages to explore” (Zoo Knoxville, n.d.-a). Guests are further able to enjoy the surroundings through the zoo’s private party packages, which include: catered events, birthday parties, weddings, after-hour photography, and the option to

host a non-profit charity walk on the zoo's premises. Additional experiences that the zoo offers include carousel rides, a "Bedtime with the Beasts" program, as well as a safari-themed water play area.

Finally, the zoo hosts a variety of educational programs. Educators are given the opportunity to bring their students to the zoo for field trips. They are also able to teach a curriculum in conjunction with the zoo, which culminates in a visit to the zoo's premises. There are also other options available on-site, such as a classroom experience that includes a zoo educator and three animal ambassadors and an activity that encourages students to compose a research question and then find its answer at the zoo. These programs are treated as other ways in which guests can have "wildly fun" experiences.

Species

As mentioned earlier, I selected three nonhuman species from this environment based on categorizations of zoo life that I have identified as contributing unique perspectives to this study. The species I have selected include American red wolves (a native species), western lowland gorillas (an exotic species), and German cockroaches (a pest species).² In addition to being principal examples of native and exotic species, American red wolves and western lowland gorillas are members of Zoo Knoxville's animal collection. German cockroaches, on the opposite end of this spectrum, are understood to cause health hazards that compromise the wellbeing of the zoo's collection animals. Additionally, zoos with AZA membership are instructed to ensure that pest species do not threaten members of the public and zoo staff as well as collection animals and wildlife.³

² These insects might also be categorized as exotic animals. Due to this study's focus on zoos and how animals may appear within their frameworks, German cockroaches appear here as a pest species instead of as a species with a history and that might be placed on exhibit.

³ This information is derived from section 2.8.1 of the AZA's "2023 Accreditation Standards & Related Policies" document. More information on AZA standards and policies can be located on the Association of Zoos and Aquariums website: <https://www.aza.org/>

Humans, of course, also serve as a central species in this analysis. Investigations surrounding them are key to understanding how humans are perceived in relation to nonhuman species. Below, I go into greater detail about each species and the circumstances surrounding its appearance at the zoo.

Red Wolves

Red wolves are one of the most endangered canids in the world largely due to predator control programs crafted to safeguard agricultural interests. As a result of these programs and hybridization with coyotes, red wolves are the first species to be removed from the wild in order to prevent their extinction and have been subject to captive breeding efforts in order to achieve restoration (Hinton et al., 2013, p. 723). Red wolves used to be common throughout the Eastern and South Central United States, but recently only 20 to 30 free-ranging wolves occupy this area (specifically Eastern North Carolina) (Phillips, 2018). As of May 2023, 278 red wolves exist throughout the country in captive breeding facilities. Zoo Knoxville is one of these locations. 23-25 wolves exist in the wild (*Red Wolf Recovery Program | U.S. Fish & Wildlife Service*, 2022). Due to their status as being only native to the United States, the AZA describes red wolves as being “a national treasure” (Association of Zoos & Aquariums [AZA Staff], 2019).

Zoo Knoxville, at the time of this study, housed four red wolves. These were males born in its 2018 litter (Zoo Knoxville, n.d.-d).

Western Lowland Gorillas

Indigenous to Africa, western lowland gorillas are located throughout the Congo Basin. Specifically, they can be found in Angola, the Central African Republic, Equatorial Guinea, Gabon Cameroon, and the Republic of Congo (Maisels et al., 2018). Western lowland gorillas face three threats: disease, habitat loss, and poaching (International Union for Conservation of

Nature [IUCN], 2015). These threats have primarily resulted in the species' decline and their listing on the IUCN Red List as a critically endangered species (Phillips, 2018). Zoo Knoxville is a participant in the Gorilla Species Survival Plan with 50 other facilities.

Three gorillas have been born at the zoo. These three are the first born in Tennessee in the last 30 years (McRary, 2016).

German Cockroaches

German cockroaches likely originated in Asia. They are then recorded as appearing in Denmark and New York before appearing widely over Europe and on most other continents (Tang et al., 2019). Trade is viewed as having been instrumental to their dispersion, and they dwell exclusively in human constructed dwellings as opposed to the wild. In connection to the wide (human) habitat range of German cockroaches, their presence has been identified as a key issue among zoos (National Research Council (US) Committee on a Review of the Smithsonian Institution's National Zoological Park, 2004). In relation to zoos, they are described as carrying parasites, such as can lead to acanthocephaliasis, and as being intermediate hosts of the parasite *pterygodermatites nycticebi* (Adler et al., 2011, pp. 125-128). German cockroaches are also seen as being allogenic but are primarily held as being nuisance animals (Tang et al., 2019).

Institutionally, the Association of Zoos and Aquariums demands that pests, including German cockroaches, must be controlled. Members of the public, zoo staff, and animal collection must be protected from these organisms ("AZA Accreditation Standards," 2023). In order to ensure that the zoo is safe in this respect, the zoo enlists the services of Ehrlich—a pest control company.

Humans

Zoos are, of course, created and maintained by humans. Humans have been collecting and

displaying animals for at least 2,500 years (Guerrini & Osborne, 2018). During this time, animals have been held to illustrate political and social power, to further understandings of nature and science, to provide the public with curiosities, and to prevent the extinction of nonhuman species (Guerrini & Osborne, 2018; Rothfels, 2002). From procuring the animals in the zoo (Braverman, 2012), designing the habitats (Rothfels, 2002), determining what constitutes a proper diet and veterinary care for the animals (Maple & Segura, 2018), and what must be done to conserve the wider species represented by the animals in the zoo (Barongi, 2018), humans are shown to be thoroughly in control of the zoo environment.

In their management of nonhuman animals, humans managing zoos have been shown to set themselves apart from nonhuman animals linguistically (Dunayer, 2001). On a more general level, this has manifested itself in definitions of humanity that set it apart from other species as well as in neglecting to use pronouns when discussing animals. On a more specific level, humans are able to describe the zoo environment and the species contained therein, according to their human perspective of the situation. (“Captivity” can be rephrased as “custodianship” (Dunayer, 2001, p. 77).) They have also been found to interpret and relay information about animal activity to the public from within ideological frameworks (Milstein, 2012b). Such interpretations sometimes obscure the true meaning of an animal’s behavior.

In sum, each species presents a unique dimension of zoo life. However, as seen through the instructions regarding German cockroaches as well as in the immense power accompanying the position of humans, not all species may be treated equally.

Materials

The materials analyzed in this study include zoo plaques, signage, and pest management documentation.

In order to secure representations of the signage and plaques needed for this study, I made a total of three trips to Zoo Knoxville to capture photographs of signs surrounding the study's nonhuman animals that were placed on exhibit.⁴ This information was largely aimed at giving guests an understanding of how to behave around exhibits, an understanding of the zoo's involvement in a Species Survival Program, and an understanding of a species' conservation status, diet, and habitat. These photographs were then stored in a Google Drive folder and sorted based on the species that they pertained to.

An identical strategy was used to collect representations of the plaques present on the zoo's grounds. This collection period occurred at the same time as the signage collecting. I collected photographic representations of plaques, which largely served to bring awareness to the nonhuman species that they represent, to honor donors, and to portray a sense of place (information that most likely represents an animal species' natural habit or the continent that it is native to). As noted earlier, these photographs were stored and sorted based on the species that they surrounded.

To ensure that I collected sufficient data regarding pest species, I contacted the zoo to request their integrated pest management program.⁵ Integrated pest management “is an effective and environmentally sensitive approach to pest management” that seeks to minimize “the possible harm to people, property, and the environment” (United States Environmental Protection Agency [US EPA], 2015). Having such a plan is particularly important in zoo environments where pest control materials may inadvertently harm the zoo's collection—as happened at the National Zoo in 2003 when two red pandas consumed “restricted-use fumigant

⁴ Some of this material was donated to the zoo by outside organizations, such as Weiler Woods for Wildlife. However, since the material was accepted by the zoo for display it was interpreted in this study as sharing the zoo's perspective and as being part of Zoo Knoxville's sign and plaque collection.

⁵ The integrated pest management program is composed of the service report and pest management manual. I received these documents from the Conservation and Science division at Zoo Knoxville (Ehrlich, personal communication, May 25, 2022).

tablets” and died (National Research Council (US) Committee on a Review of the Smithsonian Institution's National Zoological Park, 2004). In this study, this plan is accompanied by a report used by individuals at Ehrlich, a global pest control company, to report on current pest issues at the zoo, the company’s efforts to quell them, and what members of the zoo personnel should do to prevent issues from emerging.

Lastly, I gathered publicly available documentation from the AZA that provides examples of distinctions that the zoo attributes to certain nonhuman animals and how the zoo should consider the human public. In order to gain insight into the framework in which the zoo operates, I downloaded “The Accreditation Standards & Related Policies 2023” from the AZA website. This document outlines the association’s standards regarding animal care, guest services, and zoo management. While this material was not analyzed as the signage, plaques, and pest material were, it contributed to this study’s work of conveying how pest species are perceived in the zoo’s infrastructure.

Ecolinguistics and Ideology, Framing, and Salience

The concepts of “framing,” “ideology,” and “salience” were central to my framework, allowing me to identify larger themes in the patterns embedded in zoo documentation, plaques, and signage. As suggested in my discussion of ecolinguistics, being able to group more minute linguistic elements into larger frameworks assisted me with making comparisons across species.

Stibbe notes that:

The stories we live by are embedded deeply in the minds of individuals across a society and appear only indirectly between the lines of the texts that circulate in that society.

They are therefore not immediately recognisable as stories, and need to be exposed,

subjected to critical analysis, and resisted if they are implicated in injustice and environmental destruction. (Stibbe, 2015, p. 5)

The concepts of framing, ideology, salience (and erasure as salience's opposite), were necessary to identify and explicate the stories that Zoo Knoxville is telling from the plaques, signage, and documentation where they are embedded. Written below are descriptions of each concept as well as summaries of the important elements that accompany them.

Framing

Frames (also known as scripts, schemas, and more broadly, as structures of expectation) are typically unconscious structures that are composed of semantic roles, relationships between those roles, and relationships to other frames (Lakoff, 2009; Lakoff, 2010, p. 71; Tannen, 1979). Perceptions of house mice, for instance, can change based on the settings in which the mice appear. If a mouse appears within a home, then it will likely be viewed as an unsanitary intruder (otherwise known as a pest). The presence of the mouse, its droppings, and shredded articles of clothing evoke a pest frame. If the same mouse appears in a zoo exhibit amongst clean litter and a cardboard home, then it is likely that it will be viewed more as a pet than as a pest.⁶ Frames can also merge into more complex forms. Lakoff offers an example of this phenomenon. A hospital frame might combine with a war frame to create a field hospital frame. In this frame, the hospital becomes a tent. Doctors and nurses are present, but their patients are now soldiers and the physicians become soldiers as well (Lakoff, 2009, p. 23). Frames, therefore, are structures that allow us to recognize recurring narratives based on the roles of the individuals and elements that appear.

Recognition of frames hinges on two facets of information. The first is that frames are summoned by individual words. The second is that the more individuals are exposed to particular

⁶ This example derives from a real house mouse exhibit at Zoo Knoxville.

frames, the easier they can recall them. Recalling a particular word connected to a frame conjures the frame and all of the relationships within it (Lakoff, 2010). This can develop into a more complex structure termed a simple narrative, which includes the inner workings of a frame (as described above) but with further structuring. These structures include narrative archetypes (such as a protagonist) and events that can be labeled as being either positive or negative (such as the protagonist losing all of their resources and wealth). Additionally, simple narratives evoke emotions that correspond with the nature of events (such as happiness when the protagonist regains their belongings). Simple narratives can be specific to a particular culture through the iconography, prototypes, and themes that are included. However, narratives become deep narratives when cultural particularities are blurred and a story emerges that transcends cultures (Lakoff, 2009).

A summary of the main features of framing is listed in Table 2.1 in Appendix A. These descriptions are derived from Lakoff (2009) and Lakoff (2010).

Ideology

Ideologies are made up of social representations that define a group's social identity. They dictate and arrange other socially shared beliefs. They are stable and gradually acquired. And finally, they can become so widely accepted that they lose their ideological nature (van Dijk, 2006). An example of these processes and characteristics can be illustrated in the group social identity of ethical veganism. The ideology of ethical veganism centers on the belief that consuming, testing products on, and wearing nonhuman animals is not morally justifiable in the current age of Western civilization. This belief informs adherents' decisions regarding which businesses that it is ethical to support (such as choosing to shop from cosmetic brands that do not test on animals) as well as which forms of entertainment that should be avoided (such as electing

to forgo a visit to the rodeo). Individuals typically do not become ethical vegans immediately, and instead undergo a gradual transition. If all individuals living in the West adopted this lifestyle, then it would become a form of “common sense” and lose its ideological designation. (An example of an ideology becoming “common sense” is the acceptance of gender equality, which was originally the ideology of the feminist movement.) Ideologies are also not always apparent in discourse. They are either mitigated or amplified depending on the nature of a communication event (such as who the audience is and what affordances and constraints must be taken into consideration). Ideologies also emerge in a social group’s responses to social events and in individual opinions about events (van Dijk, 2009) .

Table 2.2 in Appendix A contains a summary of the main features of ideology. These descriptions are derived from Goatly & Hiradhar (2016), van Dijk (2000), van Dijk (2006).

Salience/Erasure

Salience concerns bringing an item into greater focus, either visually or linguistically, to convey an air of worthiness. While erasure was not previously highlighted, its inclusion in this study holds importance. Its importance lies in being the *opposite* of salience. Erasure refers to a distortion or omission of some item from discourse. The item is presented as being irrelevant or marginal here (Fouad, 2019). Because salience and erasure are opposites, their identification surrounds many of the same strategies: activation, hypernymy, hyponymy, and passivization. When activation (or active voice) is used, individuals in a text are granted agency and are described in the act of doing. This is shown in the following sentence: “The cat inquisitively pawed on the mouse.” Passivization does the opposite and removes an individual’s agency by omitting them (the actor, experiencer, or speaker) from the text (Goatly & Hiradhar, 2016, p. 69). The sentence from above can be rearranged to say, for example, that “The mouse was pawed

on.” Furthermore, a hyponym is an item that falls underneath the umbrella of a general term (or a hypernym). By nature, the item that is a hyponym is at risk of losing its salience as it is subsumed into the category that is the hypernym (Fouad, 2019, pp. 564-565). An example of these latter two strategies can be seen in the example of “bycatch.” Instead of referring to accidentally caught fish by species, the commercial fishing industry often uses the collective label of “bycatch” to describe animals that they were not targeting and cannot sell. These animals are ultimately disposed of and often die of their injuries. Lobsters, sea scallops, and queen crabs are all specific species that fall into this general category.

Table 2.3 in Appendix A contains a summary of the main features of salience and erasure. These descriptions are derived from Fromkin et al. (2010), Fouad (2019), Fowler (1991), and Goatly & Hiradhar (2016).

Having described my methodology in detail, I begin to describe the results of this study in Chapter 3: An Examination of Species.⁷

⁷ The signs, plaques, and documents that are under discussion in the next chapter can be found in Appendix C. Each sign, plaque, and document is assigned a Figure number. These numbers are referenced in the text.

Chapter 3: An Examination of Species

In this chapter, I will report the results of this study in terms of the species described. Firstly, I will list the trends that emerged for framing. Secondly, I will list the trends that emerged for ideology. Finally, I will list the trends that emerged for salience and erasure. In doing so, I will bring to attention emerging themes that form the basis of answers to this study's two research questions: What are the differences, if any, in the linguistic treatment of nonhuman animals of different varieties (exotic, native, and pest) and what are the wider differences, if any, between the linguistic treatment of nonhuman animals and that of humans? In addition to answering the research questions, the themes discussed here reveal information that the zoo views as key for guests to know in order to further its aims of conservation and entertainment. (All Figures for Chapter 3 and Chapter 4 are listed in Appendix C.)

Red Wolves: Framing

The zoo's red wolf exhibit features a combination of two signs and one plaque (as noted in Figures 3.1, 3.2, and 3.3 of Appendix C, respectively). The first theme surrounding the red wolves centers on their critically endangered status, recognizing them as victims of human activity and as objects of human restoration efforts. A second theme emerges in the wolves' framing, noting them as a species unique to the United States. A final theme emerges that portrays them as being gentle creatures (possibly to counter cultural stereotypes of wolves as vicious predators). (Framing themes for the wolves are summarized in Table 3.1 of Appendix B.)

Critically Endangered

Figure 3.3 is framed as scientific literature due to its use of *individual words* such as "Status" "Lifespan," "Diet," "Habitat," "Range," and "Scientific." This sign features the wolves in a *semantic relationship* with humans who, in the 1900s, ushered them towards extinction.

Despite their species' near demise, the wolf population, in another *semantic relationship*, is growing under the governance of the U.S. Fish and Wildlife Service and the work of zoos and nature centers who contribute to their SSP.⁸ Figure 3.2 is framed as an informational sign for guests due to its use of *individual words* such as “AZA,” “SSP,” “Organization,” and “Institutions.”⁹ The sign states Zoo Knoxville’s participation in this collaborative work. This sign also states that when individuals visit zoos that are AZA members, they support institutions that give good care to their animals. In this way, guests to Zoo Knoxville can also be said to be in a *semantic relationship* to the wolves as contributors to managing their population. The exhibit’s lone plaque, found in Figure 3.1, depicts a female wolf and a newborn pup and evokes an artistic *frame* due to its title of “Just Settling In” and the mentioning of its form as a “casting.” It reads that it was dedicated to the zoo by Weiler Woods for Wildlife in order to praise the zoo’s efforts to save the wolves from extinction. Thus, Weiler Woods for Wildlife and the wolves enter a *semantic relationship*. The theme of the wolves being critically endangered emerges from these frames, which depict the wolves as being part of *simple narratives* where they are either the victims of or the projects of human individuals and wider institutions. These *simple narratives* can be reduced to the *deep narrative* of humans bringing harm to the natural world, but ultimately being needed to restore it.

Native to the United States

Figure 3.3 shows the wolves framed as being native to the United States. As noted earlier, this sign is framed as scientific literature. It specifically states that red wolves are the only wolves that are native to the United States. This enters the wolves into the *semantic relationship* of not only belonging to the United States but also as being unique to the United States as one of

⁸ Species Survival Plan

⁹ AZA refers to the Association of Zoos and Aquariums.

the country's own native animals. The wolves are also included in the *simple narrative* surrounding the U.S. Fish and Wildlife Service and its efforts to sustain a wild population of red wolves in North Carolina. Here, the U.S. Fish and Wildlife Service is shown reviving the victimized population of native wolves. This sign also forms the *deep narrative* that nature (in this case, the wolves who once populated the southeast of the United States) relies on humans to rescue it.

Gentle Creatures

The plaque in Figure 3.1 features “Just Settling In” as a title (accompanied by an image of a female wolf and her pup presumably preparing to slumber). The *individual word* choices of “settling” and “in,” when paired with the image of the two wolves and its description as a “casting,” establishes the sign's framing as an artistic work. Furthermore, the text below the image reads that the plaque was created “In honor of Zoo Knoxville's Efforts to Save Red Wolves from Extinction.” These elements contribute to a theme: the gentleness of red wolves. It echoes the signs in Figure 3.2 and 3.3 in noting the wolves as victims on the verge of extinction. The plaque shows the wolves in the *semantic roles* of being gentle creatures and of being victims of human activity. The accompanying *simple narrative* is that wolves, as parents, are gentle and nonthreatening in the care of their offspring.

Western Lowland Gorillas: Framing

The zoo's western lowland gorilla exhibit is heavily decorated and includes a combination of over 21 plaques and signs. (The 21 that relate most to the gorillas are featured in this study.) One theme surrounding the gorillas centers on their vulnerability to the threats that plague them. In addition to this theme, another reveals humans as being necessary to sponsor the zoo's gorillas. A final theme focuses on similarities between the gorillas in the wild and those found at the zoo

as well as on the similarities between humans and the zoo's gorillas. (Framing themes for the gorillas are summarized in Table 3.2 of Appendix B.)

Threat Surrounded

The sign in Figure 3.19 is styled as an information tract through its use of the *individual words* “habitat,” “loss,” “infectious,” “disease,” “illegal,” “hunting,” “bushmeat,” “pet,” “trade,” “entertainment,” “industry,” “learn,” “support,” and “crisis.” It identifies the gorillas’ dependency on their forest environment and states that apes are driven into greater contact with humans due to fragmentation caused by agriculture. Apes, as a result, contract diseases, such as Ebola, and become victims of illegal bushmeat hunting. This figure sees gorillas in a *semantic relationship* with humans who are encroaching on their habitat. *Simple narratives* emerge from this relationship that state that human encroachment on ape habitat causes human/ape contact to increase and brings gorillas into contact with diseases with which they have little resistance; gorillas are hunted for bushmeat at an unsustainable rate; and that hunters are well paid in African and Asian markets because bushmeat hunting is illegal. The *deep narrative* that is featured here notes that humans are causing animal populations to decline. The sign in Figure 3.16 similarly communicates that forest habitats are important to different species. It notes that forests support a diverse host of animal life. However, forests are diminishing because humans are currently, and have been for some time, destroying them for human purposes (such as the creation of roads and land suitable for agriculture). Here, a *semantic relationship* exists between forests and the animals for which they operate as a habitat.

Human Funded

The previous theme of gorillas relying on human activity to protect their habitat is here reconfigured into plaques stating the names of individuals and corporations who have

contributed to the zoo's gorilla habitat and to their wider forest habitat in general. A plaque in Figure 3.6 reads that WIVK/Dick Broadcasting contributed the funds for the gorillas' courtyard. A similar plaque in Figure 3.21 reads that Mr. and Mrs. Ross Faires are responsible for the gorillas' nursery. In both of these plaques, a *semantic relationship* exists between the giver and the gift. These relationships result in *simple narratives* that show WIVK/Dick Broadcasting and the Faires giving gifts towards the construction of the gorillas' courtyard and nursery. Through these plaques, a *deep narrative* emerges that human assistance is needed to assist nature with thriving.

Related Creatures

To a lesser degree, signs center on gorilla behavior. The sign in Figure 3.12 is framed as scientific literature due to its inclusion of the *individual* words "status," "wild," "scientific," "name," "lifespan," "range," "habitat," and "diet." This sign states, for example, that male gorillas observe their territory from elevated spaces (such as trees). The same is true of the gorillas at the zoo. Another facet of information that the sign shares is that human and gorilla behavior differs on the action of staring. Gorillas interpret stares as a sign of aggression, but humans often stare at constituents when they are conversing with them. Firstly, a *semantic relationship* exists between the gorillas at the zoo and their habitat, called Gorilla Valley. Secondly, a *semantic relationship* also exists between the gorillas in the wild and their habitat. Thirdly, a *semantic relationship* exists between the gorillas of the zoo and those in the wild. Lastly, a *semantic relationship* exists between humans and the gorillas of the zoo. The first *simple narrative* that emerges from this sign is that the zoo's gorillas behave like those in the wild. The second *simple narrative* is that human guests should turn away if gorillas should make eye contact with them. Different interpretations of staring give rise to a *deep narrative* that

relates this behavior to a visiting human stranger encountering conflict with surrounding cultural behaviors. Figure 3.5 notes the biographical information of the gorillas and is identifiable as a biographical sign through the following *individuals words*: “born,” “parent,” and “daughter.” Place of birth is stated alongside personality and, in some instances, parentage. Andi, for instance, was born at Zoo Knoxville on September 10, 2016 to Kowali and Bantu. The gorillas are also described in terms of personality, with Andi listed as enjoying the activities of eating and playing with her siblings. Common *semantic relationships* in this sign include the relationships between the gorillas and their dates and places of birth; the relationships between the gorillas and their parents, offspring, or siblings; and the relationships between the gorillas and their personalities and pastimes. *Simple narratives* note where the gorillas were born and how they interact with each other and human keepers. The *deep narratives* present here note that both gorillas and humans have a birthday and a place of birth and that both gorillas and humans have diverse parenting styles and are protective of their offspring.

German Cockroach: Framing

German cockroaches are not featured in signs and plaques at the zoo. However, their significance is revealed in content by Ehrlich, a company committed to managing pest species, as well as in the AZA guidelines referenced in Chapter 2. Ehrlich reveals that cockroaches are known as having the ability to host bacteria and to aggravate allergies and asthma.¹⁰ Moreover, they are perceived by guests as being indicators of unsanitary conditions within buildings. This framing is evident in both the zoo's pest management program, more specifically called the pest management manual, and the report generated by Ehrlich service specialists. Two themes emerge

¹⁰ This information is offered by Ehrlich in a 2018 online article titled “How cockroaches can make you sick” by Ashley Smith. This online article offers perspective on how Ehrlich views cockroaches, and by extension, how Zoo Knoxville views them as well. The article can be read here: <https://www.jcehrlich.com/help-and-advice/blog/cockroaches/how-can-cockroaches-make-you-sick>

within these documents: German cockroaches as opportunistic creatures capable of infiltrating zoo structures and German cockroaches as hazardous organisms. (Framing themes for the cockroaches are summarized in Table 3.3 of Appendix B.)

Opportunity Seeking

Multiple comments written in the service report note that cockroaches can enter into structures, such as the zoo's "Pranzo Paper Towel Dispenser" in Figure 3.30, through access areas. These areas often appear where there are unsealed pipes that connect to the floor and wall of a structure. Zoo personnel are asked by a Erhlich service specialist to seal these openings to prevent entry by pest species, such as German cockroaches. Similarly, in a Figure 3.30 comment referencing debris clogging a sink in the "TN Hotdogs" facility, zoo personnel are asked by a specialist to remove the debris in order to prevent pest species from being attracted to it. A Figure 3.31 comment concerning leaking and standing water, "Ext Great Apes," reveals a specialist requesting that zoo personnel remove standing water in order to prevent unsanitary conditions and attracting pests. Lastly, in the "Ext Upper Administration" comment that is also found in Figure 3.31, a specialist asks that trees and other vegetation connected to an upper administration structure be trimmed to prevent pests from entering. The document from which these examples are taken is framed as a service report, specifically relating to what actions have been taken to curtail the activity of pest species at the zoo and what future actions should be taken. This is apparent through its use of *individual words* such as "recommendations," "area/device," "prevent," "pest," and "entry." *Semantic relationships* exist between the cockroaches and other pest species that are seeking entry into the zoo and the specialist who predicts their future activity and acts against them. *Semantic relationships* likewise exist between the pest species and the zoo personnel who are tasked with preventing their activity. The *simple*

narratives present note that cockroaches, and other pest species, have access to areas of the zoo that they should be restricted from, that the zoo's specialist notices pest activity, and that the specialist requests that zoo personnel alter the environment to prevent pest entry. Therefore, the *deep narrative* that emerges concerning German cockroaches is that they should be prevented from entering the zoo environment by the zoo's specialist and its personnel.

Hazardous

As noted in the first theme, German cockroaches are often referenced alongside sanitation concerns. As they are a species that is to be pointed out and restricted by service specialists and zoo personnel, German cockroaches are treated as hazards in the zoo environment. Figure 3.25 provides several examples of this. The opening of this document notes that the zoo's specialist "evaluates sanitation and structural deficiencies conducive to a pest infestation." Additionally, a comment located under the "Insect Management" header states that zoo facilities are "inspected to determine if insect activity or evidence is present and to identify areas that require corrective sanitation and structural maintenance measures." The document in Figure 3.25 is framed as a pest management manual. This is apparent through the use of the *individual words* "pest," "management," "manual," "service," and "requests." Both comments bring attention to the connection between pest species, including German cockroaches, and unsanitary conditions. The comments also highlight that the arrival of this species is not favorable and should be prevented by correcting sanitation issues. The first comment features a *semantic relationship* between the pest infestation that is described and its causes of sanitation and structural deficiencies. From this relationship a *simple narrative* emerges that infestations of insects can result from disorder, such as sanitation and structural problems. In the second comment, there is a *semantic relationship* between the specialist who is doing the inspecting and

the “insect activity,” “insect evidence,” “sanitation deficiencies,” and “structural deficiencies” that are being searched for. Here, a *simple narrative* emerges that states that specialists must search for insect activity and evidence and the sanitation and structural issues that gave rise to the insects’ presence. A *deep narrative* present in both comments notes that present disorder will give rise to future disorder.

Humans: Framing

Humans occupy a variety of roles throughout the red wolf and western lowland gorillas exhibits. Additionally, they appear frequently in the documentation that rules over how German cockroaches should be treated at the zoo. Accordingly, several themes emerge. Humans are depicted as having been a threat to red wolves that brought them to the brink of extinction. But, they also appear as restorative heroes resolved to bring the wolves back from near depletion. Humans are also featured as explorers navigating the western lowland gorilla’s exhibit, benefactors contributing to the building of the wolf and gorilla exhibits, animals that are similar to gorillas, house guests to the gorillas’ exhibit home, spectators who are visiting the zoo and viewing the gorillas, and as inspectors and controllers who seek to eliminate the cockroaches from the zoo. (Framing themes for humans are summarized in Table 3.4 of Appendix B.)

Threats

This theme emerges from *simple and deep narratives* where humans harm nature (particularly nonhuman animals). The sign in Figure 3.20 illustrates this, stating that the IUCN status of the gorillas changed from endangered to critically endangered in 2007 due to devastation caused by poaching, the Ebola virus, and logging. Each of these dangers relates to human activity, specifically through hunting, exposing gorillas to diseases that they share with humans, and habitat destruction. Here, a *semantic relationship* exists between humans and the

gorilla's changing IUCN status. Resulting *simple narratives* state that the gorillas are critically endangered due to high levels of disease and hunting and that logging contributes to poaching by altering forest structure. This sign is framed as a piece of scientific literature, with the *individual words* "status," "lifespan," "diet," "habitat," "range," "scientific," "name," and "study" working to identify it as such. The *deep narrative* featured here, of course, is that humans are destroying nature. Similarly, Figure 3.3 contains a *semantic relationship* between wolves and humans and explains that red wolves nearly became extinct in the 1900s due to human activity. As a result, the *simple narrative* communicated here is that humans nearly drove the wolves to extinction. The corresponding *deep narrative* is that humans harm nature. Like the sign in Figure 3.20, this sign is framed as a piece of scientific literature due to its inclusion of the *individual words* "status," "lifespan," "diet," "habitat," "range," "scientific," "name," and "study."

Restorative Heroes

On the opposite side of the spectrum, humans are portrayed as being necessary to saving nature from harm caused by humans. Figure 3.2 and Figure 3.4, which contain SSP signs for the gorillas and wolves respectively, provide an example of this and are framed as informational tracts through their use of the *individual words* "animal," "Zoo Knoxville," "dedicated," "(AZA)," and "(SSP)." These signs show *semantic relationships* between the zoo and the two critically endangered species it is committed to supporting by being part of the SSP programs; the AZA and global wildlife through the association's aim to support global wildlife conservation; and zoo guests and the zoo when guests decide to contribute to the organization monetarily by visiting it. *Simple narratives* that result from these relationships show individuals and organizations being characterized as being heroic as they aim to care for endangered and threatened species. This establishes the *deep narrative* of animals needing human aid to deliver

them from the threat of extinction caused by humans. Another instance where this theme appears is in the sign of Figure 3.19 which is framed as a tract of information for guests. This is shown through *individual word* choices such as “habitat,” “loss,” “infectious,” “disease,” “illegal,” “hunting,” “bushmeat,” “pet,” “trade,” “entertainment,” “industry,” “learn,” “support,” and “crisis.” Guests are advised on how they can combat the expansion of agriculture, roads being cut through the gorillas’ habitat, the gorillas’ contact with disease, and the gorillas’ use as bushmeat. To be proactive in countering issues surrounding gorillas, guests are asked to visit www.gorillasp.org to learn more about gorillas and www.pasaprimates.org to think about gorillas from a global perspective. Thus, *semantic relationships* exist between guests and these websites. Guests taking action to save gorillas by visiting either website serves as a *simple narrative*. Guests taking action by following these guidelines results in the *deep narrative* that humans can counter human-caused destruction and can restore the animal populations.

Explorers

The gorillas’ exhibit, which uses a plethora of signs to create the atmosphere of an African forest, casts humans as explorers. The sign in Figure 3.10 illustrates this. It is framed as an interactive sign due to its inclusion of buttons that guests can press to hear examples of animal communication and its use of *individual words* that engage guests directly, such as “you” and “listen.” *Semantic relationships* exist between guests and the elements that this activity entails: the trees (that prevent the guest from seeing the forest as a whole) and the animal communication (that the guest listens to). *Simple narratives* emerge involving guests when they are told that they cannot see the forest for the trees and that they should listen to how animals communicate in the forest. The resulting *deep narrative* is that humans are, without exerting effort, unable to understand nature.

Benefactors

Plaques announcing individuals and organizations who have contributed to the red wolf and gorilla exhibits are significant. This is clearly shown in the plaque found in Figure 3.7. As alluded to above, this plaque is framed as an honorarium through its use of the *individual words* “gift” and “from.” The Pilot Corporation is honored for contributing monetarily towards the Gorilla Overlook element of this species’ exhibit. There is a *semantic relationship* between the Pilot Corporation and their gift of the Overlook. The resulting *simple narrative* is that the Pilot Corporation gave a monetary gift to the cause of expanding the gorillas’ exhibit. An identical occurrence can be found in the plaque in Figure 3.6. This plaque adheres to the framing above and reveals that Mr. and Mrs. Ross Faires contributed monetarily to the Gorilla Nursery. Here, there is a *semantic relationship* between the Faires and their gift of the Nursery. The *simple narrative*, as above, is that the Faires gave a monetary gift towards expanding the gorilla exhibit. This contributes to the *deep narrative* that human aid is needed to support nature.

Similar but Different Animals

One sign, in Figure 3.12, draws attention to a trait shared by both humans and gorillas, a propensity to assign meaning to eye contact and staring, and then notes differences that emerge in this vein. Specifically, the sign notifies guests that they should look away if a gorilla looks at them. For gorillas, stares are an act of aggression. For humans, it is an act of attentiveness and friendliness. This sign is framed as scientific literature through its use of the *individual words* “status,” “wild,” “scientific,” “name,” “lifespan,” “range,” “habitat,” and “diet.” A *semantic relationship* exists here between humans and gorillas as humans should be careful when making eye contact with or staring at gorillas. Confrontation between gorillas and humans who glance or stare is similar to how a human stranger might trigger an unwanted confrontation in another

human culture due to differences in societal norms. This is the *deep narrative* that is featured here.

Spectators

Humans are also portrayed as being spectators. This theme emerges from the identical signs in Figures 3.23 and 3.24. Framed as instructional signs that tell guests where to find gorillas in the event of inclement weather, they utilize *individual words* such as “inclement,” “weather,” “look,” and “indoors.” If guests want to see the gorillas, they may have to look in the courtyards or nurseries. A *semantic relationship* exists here between humans, who want to view gorillas, and the gorillas, who may relocate to a more protected location. A *simple narrative* emerges that, in the event of inclement weather, human guests will likely have to search for the gorillas if they want to view them.

Guests

On one occasion, humans are not merely treated as guests in the zoo but also as guests in the gorillas’ home. The sign in Figure 3.22 asks, in the voice of the gorillas, that zoo guests keep the gorillas’ home peaceful by not tapping on the glass. This sign is framed as an instructional sign as shown through its inclusion of the following *individual words* “help,” “keep,” “please,” “do,” “not,” “thank,” and “you.” There is a *semantic relationship* present between the guest being addressed and the gorillas’ home. There is also a *semantic relationship* between the guest and the gorillas through the “thank you” that is offered to the guest by the latter party. Additionally, two *simple narratives* emerge. The first is that the gorillas ask the guest to refrain from tapping on the glass. The second is that the gorillas thank the guest for refraining from tapping on the glass. These *simple narratives* give way to a *deep narrative* that guests should be respectful when they visit a host’s home.

Inspectors

The pest management manual in Figure 3.25 reveals that service specialists act as inspectors who determine if cockroaches are present in a facility. Under the “Insect Management” header, the manual remarks that the zoo is inspected to determine if “insect activity or evidence is present.” The zoo’s specialist is the one who will do the inspecting. The framing of the manual as a pest management manual is presented through the use of the *individual words* “pest,” “management,” “manual,” “service,” and “requests.” *Semantic relationships* exist between the specialist and the insects’ activity and any evidence that they leave behind. This contributes to the *simple narrative* that the zoo is monitored to curtail the arrival of German cockroaches and other pest species. The resulting *deep narrative* is that pest species are sought out to be eradicated by humans.

Controllers

The manual in Figure 3.28 also shows that humans are treated as a means of control to prevent cockroaches from entering and dwelling in a facility. A comment located under the “Sanitation and Structural Deficiencies” header notes that the zoo’s service specialist “documents situations relevant to the overall success of” its “pest management program and needing” its immediate attention. By correcting these issues, more control will be introduced and the environment will be pest-free. There is a *semantic relationship* between the specialist and the storage, sanitation, and pest-proofing errors that would introduce cockroaches and other pest species. There is another *semantic relationship* that takes place between the specialist and time sensitive issues that would jeopardize the effectiveness of the pest management program. (Presumably, these issues involve cockroaches and other pest species.) The *simple narrative* that results notes that the specialist reports issues involving pest species so that these animals will be

either prevented from coming into the zoo's environment or removed from it. Similarly to the paragraph above, this comment's *deep narrative* is that species thought of as pests are sought out to be eradicated by humans.

Red Wolves: Ideology

Red wolf conservation is a central theme of the single plaque and two signs featured in the wolves' exhibit. Particular attention is brought to the zoo's affiliation with the AZA and its global renown. The material in the exhibit also highlights recognition that the zoo has received from other conservation-oriented organizations. The wolves' material also features a theme centered on identification. It particularly focuses on the wolves' unique range and their physical features, which connects to the zoo's aim of instructing guests on methods of noticing and connecting to nature. The wolves are noted, for example, as being the only wolf species solely native to the United States and are discussed in terms of the "reddish-brown" color on their backs. In the exhibit's lone plaque, the wolves are illustrated as being gentle creatures that differ from potential guest perceptions of them as vicious predators. This illustration of the wolves as being gentle helps to highlight their vulnerability to extinction. Hence, illustrating that wolves are worthy to be saved from extinction becomes a theme as well. *Topics* and *repetition* bring these themes into perspective. (Ideology themes for the wolves are summarized in Table 3.5 of Appendix B.)

Conservation

Conservation is a *topic* that occurs multiple times throughout the wolves' exhibit. Efforts towards bringing the wolves' back from the brink of extinction are discussed in the sign in Figure 3.3 where it is mentioned that the U.S. Fish and Wildlife Service managed a reintroduction program in conjunction with nature centers and zoos that are part of the SSP.

Conservation appears again as a *topic* in the wolves' SSP sign, in Figure 3.2. This sign notifies guests that the zoo is part of the red wolf SSP. Also, guests are notified that they, by visiting the zoo, give their support to an organization that is committed to global wildlife conservation through its AZA membership. Conservation also becomes an example of *repetition*. This theme is present in each of the wolves' signs. In addition to conservation's inclusion in Figures 3.2 and 3.3, it appears in Figures 3.1 through Weiler Woods for Wildlife honoring the zoo for its conservation work.

Identification

In the sign of Figures 3.2, a central *topic* is red wolf identification. The “reddish-brown” fur on the backs of the wolves is described alongside their size in relation to gray wolves. The wolves are also described as being the only wolf that is solely native to the United States—a distinct status.

Save Worthy

In Figures 3.1's plaque, the title, “Just Settling In,” elaborates on the imagery of a female wolf and her pup that is featured beneath it. The focus of this plaque, as shown through the title and imagery, is the *topic* of the wolf's gentle disposition when interacting with her pup or the wolf's gentle disposition in general. Below the image itself is an inscription that reveals the plaque as having been dedicated to the zoo's efforts to save red wolves from extinction. When the *topic* of the wolves' conservation is added to the *topic* of their gentleness, it can be argued that the wolves' gentleness is part of a justification for conservation efforts surrounding them.

Western Lowland Gorillas: Ideology

In the 21 signs and plaques featured in the western lowland gorilla exhibit and that reference them in the surrounding African forest exhibit, several ideological themes emerge. These themes

center on four domains: contributions made to the zoo by benefactors, the behavior of the zoo's gorillas, the destruction of gorilla habitat and of gorillas themselves, and pleas for guests to be attentive to their senses and to animal communication as they walk through the zoo's forest exhibit. The use of *comparison* and *topics* brings these into focus. (Ideology themes for the gorillas are summarized in Table 3.6 of Appendix B.)

Contributions

In the gorillas' exhibit, there are four plaques that feature information regarding donor contributions. The plaques in Figures 3.6, 3.7, and 3.21 feature the phrase "a gift from" and then list the names or organizations of those who have given. The plaque in Figure 3.15 similarly issues a "Thank you" to the Alcoa Foundation. Each of these signs focuses on the *topic* of giving. This communicates the importance of contributions to the flourishing of the gorillas.

Behavior

Four signs direct attention to gorilla behavior. One sign, in Figure 3.12, compares the zoo's gorillas to gorillas in the wild. This *comparison* allows the zoo to note that the gorillas in captivity are similar to gorillas that still inhabit the natural world in that they both watch their habitat. Secondly, the sign compares gorilla behavior to human behavior. Gorillas interpret staring as a sign of aggression while humans regularly make eye contact when communicating. Another sign, the one featured in Figure 3.13, uses *comparison* by telling guests that gorillas are generally calm unless they are disturbed. The signs in Figures 3.23 and 3.24 make gorilla behavior their *topic* by primarily conveying that the gorillas may choose to be in the nursery or courtyard during inclement weather.

Destruction

There are several instances of the theme of destruction that range from the need for guests to recycle their cellphones to protect gorilla habitat to diseases that gorillas are susceptible to. One example of this is the sign found in Figure 3.18. This sign centers on the *topic* of conservation by reusing and recycling electronic products. This reduces the need for coltan mining, a practice that destroys the habitat of gorillas in the wild. Another sign, found in Figure 3.16, informs guests about what they can do for forests. It brings to the fore the *topic* of diminishing forests. This issue results from humanity's actions of expanding agriculture, building roads, sourcing firewood, constructing paper products, and gathering building materials. Two other signs provide insight into this theme. One *topic* featured in the sign of Figure 3.19 includes the threats surrounding the apes (such as bushmeat hunting and habitat destruction due to road construction) and ways that guests can aid the gorillas. A *comparison* is also made here between human diseases and those that infect apes. The *comparison* functions to highlight the similarity. Similarly, the sign in Figure 3.20 centers on the *topics* of threats that are facing gorillas. These include exceptionally high levels of disease (Ebola) and hunting, the commercial bushmeat trade, the spread of logging, and the fact that 80% of gorillas live outside of protected habitat.

Attentive

The sign in Figure 3.10 asks guests to listen to animal communication in order to gain better insight. As a result, this sign makes human awareness and its ability to interpret animal communication its *topics*.

German Cockroaches: Ideology

Service report comments and manual details surrounding German cockroaches bring six ideological themes to the fore. These are brought into focus through the *topics*, *comparisons*,

euphemisms, and *repetition* surrounding preventing cockroaches and other unwanted species from being attracted to a facility, entering it, and infesting it; noting the presence of German cockroaches and other unwanted species that appear; noting the treatments that can be prescribed to quell an infestation of these species; noting structural deficiencies that surround the zoo; describing the ability of zoo personnel to act against cockroaches and other unwanted species; and describing the ability of service specialists to notice and take action against cockroaches and other unwanted species. (Ideology themes for the cockroaches are summarized in Table 3.7 of Appendix B.)

Prevention

Topics under this theme center on preventing habitat formation, attraction to water and debris, and evaluating conditions that may result in infestations. An example of the first facet of this theme can be seen in a service specialist's comment, Figure 3.30's first "TN hotdogs-paper towel dis," that damage to a door must be repaired in order to restrict pest access, and by association, the formation of a suitable habitat for these species. A specialist also notes, in Figure 3.31's first "Ext Great Apes" comment, that the standing water located on the roof of a great ape structure should be removed to prevent the attraction of pest species. A statement found in Figure 3.28, under the "Sanitation and Structural Deficiencies" header in the pest management manual, informs that "proper storage, sanitation, and pest proofing" supplement the measures put into place by a pest management program and will help to ensure that a facility is free of pests.

Comments and statements also use a *euphemism* when they use the word "management," as in the phrases "insect management" and "pest management program." This is because the word "management" disguises how the targeted species are placed under control. They are likely killed, for example, in order to achieve a clean, ideal environment. An example of this appears in

Figure 3.25 underneath the “Insect Management” header where insect management tools are described.

Recognition

Another ideological theme surrounds the *topic* of recognizing pest species. One example emerges at the beginning of the pest management manual in Figure 3.25, under the “OR (it cannot be both)” header. Here, the document discusses the process of service specialists recording information on “pest trending” and notifying the zoo about the presence of pest species. A similar statement under the “Insect Management” header, also in Figure 3.25, states that facilities will be inspected for insect activity and presence as well as how to manage this situation.

Treatment

Another *topic* emerges surrounding the treatment of pest species. This can be seen when a service specialist discusses eliminating habitat formation. Examples can be found in the service report comments of Figures 3.30 and 3.31. Comments, such as “Dishwasher Area Paper Towel” and “Int The Bird Show,” reveal a service specialist requesting, respectively, that the space between pipes and a wall be sealed to prevent pests from entering and that debris be removed to prevent the attraction of pest species. Other comments in this document, found in Figures 3.33 3.34, focus on the topic of applying preventative treatment—the insecticides Nyguard and Alpine WSG—for pest species in areas such as those listed in the “Safari smokehouse” and “TN hotdogs-paper towel dis” comments. The pest management manual, in Figure 3.25, also addresses the *topic* of treatment in its statements under the “Insect Management” header. The zoo’s service specialist must determine that insects are active and present and then utilize techniques, such as insect baits and aerosol, to address their presence. Additionally, under the

“Sanitation and Structural Deficiencies” header, in Figure 3.28, the manual notes the importance of correcting a facility’s deficiencies regarding “storage, sanitation, and pest proofing” to prevent the appearance of pest species.

Repetition is used in the “General Comments” section of the service report of Figure 3.26. Here, the service specialist discusses several areas that they treated at the zoo for pest species. This illustrates the importance of treatment to the zoo and the specialist.

Structural Deficiencies

Preventing cockroaches and other pest species from forming habitats, because of structural deficiencies, is a *topic* that also helps to form this theme. This can be seen in the service report of Figures 3.29 and 3.30. Comments such as “Int Budgie Building” and “Restrooms,” respectively, warn that pest entry is imminent unless repairs are made to the walls or doors of the facilities being discussed. An example found at the beginning of the pest management manual of Figure 3.25 centers on the service specialist’s duty to evaluate structural deficiencies that could lead to an infestation. This *topic* appears again, also in Figure 3.25, under the manual’s “Insect Management” header and focuses on the role of the service specialist in identifying areas where structural deficiencies exist.

Ability: Zoo Personnel

The ability of zoo personnel to prevent German cockroaches and other pest species from entering the zoo environment is a theme composed of multiple *topics*. One of these is the *topic* of preventing cockroaches and other pest species from forming habitats in the zoo’s structures. Examples of this theme are frequent. One can be found in the service report from Figure 3.31. In the “Hay Barn” comment, the service specialist requests that zoo personnel fill in the gaps between pipes and a wall to prevent pest species from entering the structure. Another *topic* that

contributes to this theme is the ability of zoo personnel to remove debris or excess water to prevent pest species from being attracted to a structure or location. This is shown in an Figure 3.31 comment, “Tool Room,” where zoo personnel are asked to remove debris that is collecting underneath storage shelves. This debris could attract pest species to the area. Under the “Sanitation and Structural Deficiencies” header from Figure 3.28, zoo personnel are informed that their zoo’s service specialist will document situations that will significantly impact the success of the pest management program and that require immediate attention.

Ability: Service Specialists

The ability of service specialists to quell German cockroach activity is another theme. One *topic* relating to service specialists is preventing German cockroaches and other pest species from forming habitats by repairing the environment. An example of this appears in a comment from the service report in Figure 3.30. “RBS 20” notes that pipes are extending through the wall of one of the zoo’s structures and, as a result, are providing pest species with an entrance. By advising zoo personnel to fill in gaps that appear between the pipes and the wall, the specialist reduces the chances that the pest species in discussion will be able to remain in the building. A similar *topic* involves removing debris and water in order to prevent pest species from being attracted to a site. The zoo’s specialist, in a service report comment titled “TN hotdogs-paper towel dis,” the fourth of its name in Figure 3.30, requests that zoo personnel remove debris in order to prevent pest species from being attracted to it. Preventing the arrival of these animals curtails habitat formation. Another *topic* is that specialists also apply treatment for German cockroaches and other pest species, as seen in the “Nyguard 1021-1603” comments in the service report, in Figures 3.33 and 3.34, to disrupt habitat formation in these areas. This *topic* is also

illustrated in the “General Comments” section, located in Figure 3.4, of the service report. Here, the zoo’s service specialist makes note of the areas that they have treated.

The variety of *topics* expands in the pest management manual. At the beginning of the document, in Figure 3.25, specialists are described as evaluating deficiencies that lead to pest infestations in order to quell them. This makes evaluation a *topic* here. Under the “OR (it cannot be both)” header in the same document, they are also noted as recording details on service reports and providing information on pest species that are trending. This makes managing details a *topic* as well. Specialists also determine if insects are active, evidence of insects is present, and what structural deficiencies and sanitation issues exist as shown in the statement under the “Insect Management” header, also located in Figure 3.25. This makes identification a *topic*.

In addition to the *topics* surrounding service specialists, a *euphemism* appears whenever the term “Service Specialist” does. This is due to the fact that “Service Specialist” is a term that is masking the specialist’s job of killing pest species. The term “Service Specialist” makes this role appear to be humane because it masks the brutality of the actions associated with it. Another *euphemism* is the word “treated,” as it too masks the brutality of the actions that are being described by this term—the killing of pest species. Instances of these *euphemisms* can be seen at the beginning of the manual in Figure 3.25 and underneath the “General Comments” header of Figure 3.34, respectively. (The word “treated” also recalls the “hazardous” frame and the understanding of the roaches as a hazard that must be eliminated.)

The *repetition* of the word “treated” underneath the “General Comments” header also serves as a mark of how central this action is to the role of the service specialist.

Humans: Ideology

There are many instances of *topics*, *repetition*, *euphemism*, and *comparison* across the two exhibits and the pest management material that directly references humans. From these occurrences, there arises a variety of themes. One of these centers on behaviors that humans can adopt to improve the health of the natural world. Another brings attention to humans and their activities relating to being benefactors to the zoo. A third theme finds occurrences within these texts where humans and nonhuman animals are brought into *comparison*. A less prominent theme focuses on heightening human awareness of their time in the natural world. A fifth theme centers on humans and their ability to destroy nonhuman lives. Lastly, theme six notes the human aim to prevent nonhumans from inhabiting particular areas. (Ideology themes for humans are summarized in Table 3.8 of Appendix B.)

Improvements

The first theme can be seen in the red wolves' "Just Settling In" plaque, found in Figure 3.1. Found here is the praise given by Weiler Woods for Wildlife to Zoo Knoxville for its efforts to prevent red wolves from going extinct. Similarly, the SSP signs that appear in both the red wolf and gorilla habitats in Figures 3.2 and 3.4, as their central *topic*, argue that the organization's AZA membership means that visiting the zoo is an act of support towards an organization dedicated to the care of its animals. Additionally, there is *repetition* in these signs surrounding the theme of conservation. Using a different element, but sharing the theme of humans improving disturbances in the natural world, the sign in Figure 3.11 *compares* current responsible logging practices to irresponsible practices in the near past. This same sign also *compares* the responsible use of forest products versus the irresponsible use of forest products

(recycled papers versus non-recycled and environmentally certified wood products versus non-environmentally certified), which highlights the zoo's conservation-oriented purpose.

Benefactors

The theme of benefactors is solely developed using *topics* because recognizing individuals who contributed financially to the zoo is the *topic* of these signs. One example of this is the Gorilla Nursery plaque, found in Figure 3.6, which details that the nursery is a gift from Mr. and Mrs. Ross Faires. Similarly, the sign in Figure 3.15 surrounds the gorilla enclosure and thanks the Alcoa Foundation for being generous to the western lowland gorillas at Zoo Knoxville.

Awareness

The third theme, the theme of developing awareness of nonhuman life, is conveyed through the *topic* of a gorilla sign found in Figure 3.10. This interactive sign, titled "Can You See the Forest for the Trees," asks guests to test their knowledge of animal sounds that they might encounter in a forest.

Elimination

This theme focuses on threats to nonhuman animals that either have originated from humans or are being enacted by humans. In Figure 3.34, the "General Comments" section seemingly reveals that German cockroaches are targeted for elimination from the zoo environment. This can be seen in the *euphemism* that the grounds were "treated" by a specialist to rid the environment of pest species. *Comparison* also falls within the boundaries of this theme. Another example of this theme emerges in Figure 3.20. This sign notes that a decline of over 60% of the gorilla population has occurred over the last 20-25 years due to an increase in disease and hunting. Here, the population before and after the increase occurred is *compared*.

Prevention

The final theme is the prevention of nonhumans from being able to access the zoo environment to create habitats. Each example of this theme concerns German cockroaches. In both the service report and the pest management manual, humans are described, through *topics*, as attempting to deter the cockroaches from entering and establishing a habitat on the zoo's grounds. The *topic* of one comment, "Tool Room," from the service report in Figure 3.31, asks that zoo personnel "remove debris to prevent unsanitary conditions and attraction by pests." The comment "Nyguard 1021-1603," from the service report in Figure 3.34, contains similar content by making the application of "preventative treatment for cockroaches and other pests" its *topic*.

Red Wolves: Salience/Erasure

The two signs and the plaque that surround the red wolf exhibit utilize a variety of techniques that both emphasize and reduce the wolves' salience. The use of *hyponymy* and *activation* in this material contributes positively to the wolves' salience. The use of *hypernymy* detracts from it.¹¹ (Salience and erasure themes for the wolves are summarized in Table 3.9 of Appendix B.)

Active

Active language, or *activation*, is present throughout the sign found in Figure 3.3. Here, it is noted that "The Red Wolf is the only species of wolf native to the United States alone." The wolves are actively the only species of wolf native to the United States alone. Also in this Figure 3.3 sign, which notes the status of red wolves in the wild, the wolves are also portrayed in *active* voice. This is shown in the sentence that "Red Wolves are critically endangered."

¹¹ Passivization is not present among the red wolf signs and plaques. Therefore, this theme does not appear in this section.

Abstraction

In their SSP sign, found in Figure 3.2, the wolves are described as part of a much larger group of “animals” and “species.” This abstract language is an example of *hypernymy*.

Specificity

In Figure 3.3, which contains a sign about the status of red wolves in the wild, the wolves are described using *hyponyms*. Their species and scientific names are listed here instead of general terms. The wolves are also discussed in terms of a hyponym in Figure 3.1, the plaque dedicated to revival efforts surrounding their species. Here, they are discussed specifically as being “Red Wolves.”

Western Lowland Gorillas: Salience/Erasure

In the western lowland gorilla exhibit’s 21 signs and plaques, a variety of markers are present that either bring attention to the gorillas or decenters them. In several signs, including the biographical one in Figure 3.5, gorillas are discussed in an *active* voice. This brings attention to their agency and forms a theme. *Hypernyms* appear only occasionally, and when they appear, they diminish the gorillas’ salience as a specific species and omit details from their interactions with others—leading to *abstraction* becoming a theme. This can be seen in the sign in Figure 3.11. In this sign, gorillas are included among other species in the umbrella term of “animals.” Lastly, *hyponyms* are used in several signs and in plaques to identify the gorillas as specific types of animals—making specificity a theme.¹² (Salience and erasure themes for the gorillas are summarized in Table 3.10 of Appendix B.)

¹² Passivization is not present among the western lowland gorilla signs and plaques. Therefore, this theme does not appear in this section.

Active

The gorillas are described as being *active* in multiple signs. In a SSP sign found in Figure 3.4, for instance, the gorillas are described as *actively* being a part of the plan. As noted above, another common area where the gorillas appear as *active* agents is in signs that announce their geographic, diet, and status in the wild as shown in Figures 3.12, 3.13, and 3.20. This feature is present in all three signs of this type. Gorillas are also described *actively* in the sign “Recycling Cell Phones Saves Gorillas” of Figure 3.18. Here, gorillas are described as not surviving human-caused conflicts that arise due to coltan mining and the resulting destruction of the gorilla’s habitat. In the biographical sign of Figure 3.5, which discusses the births, family lives, and personalities of six gorillas, each of the gorillas is described using *active* language. Additionally, in Figure 3.22, a sign requesting that guests help keep the gorillas’ home peaceful by refraining from tapping on the glass, it is the gorillas’ perspective that is used and the voice that the perspective communicates in is *active*. One final example of the gorillas being noted as *active* is in the interactive sign of Figure 3.10 where they are described as silently grumbling.

Abstraction

Some *hypernyms* appear in the gorillas’ exhibit material. In relation to the gorillas, they are used sparingly. The word “animal” is used in the SSP sign of Figure 3.4 instead of the gorillas’ scientific name. In the SSP sign, the gorillas are referred to as animals as opposed to their species name. The sign in Figure 3.14 notes that many animals call forests home. Here, the word “animals” is not specifically elaborated on and is a *hypernym* as a result.

Specificity

There are a plethora of *hyponyms* that surround the gorillas’ exhibit. The Gorilla Valley/Chimp Ridge sign in Figure 3.8, for instance, is specific about each exhibit and the

species that live within it. The second Gorilla Valley/Chimp Ridge sign, found in Figure 3.9, similarly references specific exhibits and the particular animals that inhabit them. Three other signs, located in Figure 3.12, 3.13, and 3.20, specifically reference gorillas in terms of their geographic range, dietary preferences, and status as being critically endangered. Figure 3.13 particularly brings attention to types of gorillas in a troop: the “alpha male,” “silverback,” and “young males.” Figure 3.19 also is specific about the gorillas as it describes them in relation to the “commercial bushmeat trade,” “the Ebola virus,” the prevalence of logging, and the geographic locations of specific forests. In the sign of Figure 3.18, gorillas are discussed in relation to (habitat destroying) mining for coltan. When it comes to the biographical sign in Figure 3.5, each gorilla is named: “Ubuntu,” “Andi,” “Hope,” “Bantu,” “Kowali,” and “Obi.” Each gorilla’s profile is detailed, including their birth date, parents, and place of birth. Additionally, physical descriptions of the gorillas are also mentioned. Bantu, for example, is described as having a “Mohawk.” Additionally, a plaque found in Figure 3.15 issues a thank you to the Alcoa Foundation for its generosity to the gorillas. In this plaque, the “Knoxville Zoo’s Western Lowland Gorillas” are specifically mentioned in relation to the Alcoa Foundation. Also, in the interactive sign of Figure 3.10, gorillas are described in detail as being “nearly silent” and “grumbling” or as “loudly” claiming their territory. Lastly, the signs in Figures 3.23 and 3.24 reference inclement weather and specifically identify gorillas as being able to be found in courtyards and nurseries.

German Cockroaches: Salience/Erasure

In the documentation that surrounds the German cockroaches, three salience and erasure strategies are present and result in three themes: Active, Abstraction, and Specificity.¹³ *Activation*

¹³ Passivization is not present among the documentation in regards to German cockroaches. Therefore, this theme does not appear in this section.

is present and brings attention to the cockroaches ability to enter a structure and begin to inhabit it. This presents one theme. Another theme is created through the activities of service specialists who make the cockroaches their objects of destruction. *Hypernyms* appear often within the service report and the manual as cockroaches are discussed in language that encompasses a variety of pest species. Thus, *abstraction* becomes a theme. Lastly, *hyponyms* are used sparingly to discuss the cockroaches. This rarely used element forms the basis for the theme of Specificity. (Salience and erasure themes for the cockroaches are summarized in Table 3.11 of Appendix B.)

Active

Activation occurs once within the discourse on German cockroaches that is found in the manual of Figure 3.25. The section titled “Insect Management” notes that facilities are inspected to see if “insect activity or evidence is present.” Here, insects, including German cockroaches, are depicted as actively entering and making use of facilities.

Abstraction

Hypernymy appears frequently in relation to the cockroaches in two particular ways. One usage references cockroaches as “pests.” The other references them as “insects.” A less common way of describing them is as “cockroaches” (without reference to their specific species). An example of the first way of describing German cockroaches is illustrated in the comment “Ext Great Apes,” from Figure 3.31, which proclaims that excess water at the zoo should be removed from a roof in order to prevent “attraction by pests.” The second abundant way of describing German cockroaches can be seen in a manual comment, under the “Insect Management” header in Figure 3.25, describing the different insect management procedures that service specialists carry out on behalf of their clients, such as the zoo. Lastly, the cockroaches are once described

non-descriptively as solely “cockroaches.” This is shown in the “Int The Budgie Building” comment from the service report in Figure 3.29.

More examples are present. The Figure 3.31 comment, deemed “Hay Barn,” asks that “pest access” and “pest entry” be prevented. A similar request for action is made in the comment “Tool Room,” also from Figure 3.31, which asks zoo personnel to prevent “attraction by pests.” Lastly, *hypernyms* appear in the manual of Figure 3.28, under the “GPM AND IPM TRAINING” header, through terms such as “IPM,” “pest,” “insect” and titles such as “the National Pest Management Association.”

Specificity

Hyponyms regarding the cockroaches are rare and appear only in Figures 3.33 and 3.34 in descriptions of the insects targeted by particular pesticides. This is shown specifically in both Figures 3.33 and 3.34 in the descriptions of the pests species targeted by Nyguard 1021-1603. This comment specifically makes note of “German Roaches” and thereby brings particular attention to them for the purpose of destroying the population.

Humans: Salience/Erasure

There are several occurrences of *activation*, *hypernyms*, *hyponyms*, and *passivization* across the two exhibits and the pest documentation that directly relate to humans. From these occurrences, four themes arose. One of these is Active, meaning that humans are represented as possessing agency and as being active agents. A second theme, Abstraction, centers on moments in the zoo’s texts where humans are referenced with a lack of detail and clarity. Humans, in these instances, are referred to *abstractly*. A third theme is Specificity, which relates to how specific details concern human proper names, job titles, and organizations. A final theme, Passive, focuses on

instances where the technique of *passivization* is used when describing human actions. (Salience and erasure themes for humans are summarized in Table 3.12 of Appendix B.)

Active

The SSP signs in both the wolf and gorilla exhibits, which appear within Figures 3.2 and 3.4, feature the Knoxville Zoo and the Association of Zoos and Aquariums as agents who work to “cooperatively manage threatened or endangered species within AZA member institutions.” In the sign found in Figure 3.19, hunters are presented as active agents. This sign, which is located in the gorilla exhibit, reads that “hunters are paid high dollar for animal parts in African and Asian markets.” Each of these is an instance of *activation*.

Abstraction

Some signs and plaques surrounding the gorillas, and in one instance the red wolves, are not specific and are examples of *hypernyms*. This can be seen in a sign that is shared by both species: the SSP signs in Figures 3.2 and 3.4. These signs state that “when you visit a zoo or aquarium with the AZA logo, you support an organization dedicated to the care of its animals.” The “you” in the above sentence is abstract and does not directly refer to a type of guest or to a specific person. Signs surrounding the gorilla exhibit also often discuss humans nonspecifically, such as by calling them “people” and by referring to them as “you” and “we.” By addressing humans as a collective, specific distinctions about who is being addressed and by whom are left unanswered. Therefore, such addresses become examples of *hypernyms*. Another example of this can be found in the sign in Figure 3.11. This sign notes that “Making sure that there are forests for tomorrow is a big job” and “it will take all of us, working together, to accomplish.” The sign continues, saying that “by learning about forests we can ensure that they are managed carefully.” Here, humans are discussed ambiguously as a collective through the words “us” and “we.” It is

uncertain who is proposing the ideas featured in the sign and who exactly is being asked to support them. This pattern appears in several signs, including in the sign in Figure 3.12 that focuses on similar and dissimilar behaviors between gorillas and humans when it comes to the practice of staring. This sign expresses that “If a gorilla turns towards you, you may want to look away.” Again, “you” is used here ambiguously.

Specificity

This theme emerges in plaques that are featured in both the gorilla and red wolf exhibits. The plaque in Figure 3.1, for instance, notes that it was donated to Zoo Knoxville by Weiland Woods for Wildlife to commemorate the zoo’s efforts to save red wolves from extinction. Each human or organizational contributor is listed as a *hyponym*. Another example of this can be found in the plaque in Figure 3.6, which commemorates a gift from “Mr. and Mrs. Ross Faires.” Similarly another plaque in the gorilla’s exhibit, found in Figure 3.7, notes that it was WIVK/Broadcasting that contributed towards the Gorilla Courtyard.

The ways in which individuals are addressed in reference to their job titles contributes to the instances of *hyponymy*—specifically as it relates to documentation concerning pest species. The manual, for example, illustrates the naming that occurs in regard to job titles. One comment at the beginning of Figure 3.25 states that the zoo’s “Service Specialist evaluates sanitation and structural deficiencies conducive to a pest infestation.” The specific job title of “Service Specialist” establishes this as an example of a *hyponym*. As noted above, the same is true of organizations. The SSP signs in Figures 3.2 and 3.4, for example, specifically list the AZA and Zoo Knoxville. Both names are specific to each organization and are examples of *hyponyms*.

Passive

Passivation appears in a gorilla sign found in Figure 3.18. On this sign is a statement that

“It,” which refers to mineral coltan, “is mined in the Democratic Republic of Congo, which is the natural habitat of endangered gorillas.” What can only be assumed is that the mining is being conducted by humans. The actor is omitted.

Having noted the themes that have arisen, I move on to a discussion of them in Chapter 4: An Exploration of Trends Across Species.

Chapter 4: An Exploration of Trends Across Species

In Chapter three, I examined how species were treated by the zoo in terms of framing, ideology, salience and erasure. From this analysis emerged the themes that are listed and tabled in the previous chapter. In Chapter four, this present chapter, I extrapolate the significance of these themes. I organize each section by the concepts of framing, ideology, salience and erasure and open each with a summary of Chapter three's results. I follow this with a discussion of how the results relate to the literature discussed in Chapter one. I conclude by positioning my results in relation to my research questions: What are the differences, if any, in the linguistic treatment of nonhuman animals that are recognized as exotic, native, and pest species and what are the wider differences, if any, between the linguistic treatment of nonhuman animals and that of humans. Often it can be noted that the themes, their significance, and the answers to these questions are in concert across the framing, ideology, and salience and erasure sections.

Theme Summary: Framing

Among the framing for red wolves was a trend towards portraying these animals as being gentle creatures and as being critically endangered. A final theme discussed the wolves in relation to their being the only species of wolves that are native solely to the United States.

The framing surrounding western lowland gorillas illustrated them as being, first, encompassed by threats such as forest fragmentation, disease susceptibility, and poaching. A second theme that arose is that the gorillas are reliant on humans to build their artificial habitat at the zoo and to preserve their species from extinction. A focus on gorilla behavior emerged that formed the final theme. This focus encompassed similarities and differences between human and gorilla behavior and similarities between gorillas in the wild and the zoo's captive gorillas.

There were primarily two themes that surrounded the framing of the German cockroaches: their status as opportunity seekers and as hazardous animals.

Lastly, a multitude of themes surrounded human framing. It is important to note that the framing of humans largely affected the framing of other animals; human interactions with other species supply much of the zoo's framing.

The first theme held humans as threats to the wellbeing of nonhuman animals in the wild. On the opposite end of the spectrum, humans were framed as being restorative heroes and, as a result, as being necessary to the survival of nonhuman animals. In a similar theme, humans were cast as benefactors who supply the zoo's nonhuman animals with habitat. Furthermore, humans were framed as being explorers who must attune their senses to their environment as they travel through a forest. Humans were also portrayed as similar to, but also different from, species of nonhuman animals. Additionally, humans were sometimes portrayed as spectators. On at least one occasion, humans were depicted as house guests within an exhibit. Lastly, humans were presented as being inspectors and controllers.

Theme Interpretation: Framing

The portrayal of red wolves in the zoo's plaque and signage utilizes mediation theory. This is particularly apparent in the portrayal of the red wolves as being gentle and critically endangered. Rogers (1998), Carbaugh (1999), Carbaugh (2007), and Plec's (2012) directives that humans be attentive to the earth can be found in the wolves' characterizations as being gentle and endangered animals. An instance of this arises in the plaque in Figure 3.1 which depicts a female wolf and her offspring in a den. This plaque also praises the zoo for its efforts to save the species from extinction. The combined arguments and findings of Rogers (1998), Carbaugh (1999), Carbaugh (2007), and Plec (2012) state that earth, specifically animals, should be

listened to and responded to. The vulnerable state of the female wolf and her pup mirrors the critically endangered status of the species as a whole. These themes also align with Callister's (2012) observation that material bodies precede representations. The wolves' portrayal as gentle and critically endangered, as shown in Figure 3.1, originated in the physical reality of the wolves' diminishment by hybridization and killings by humans.

Additionally, the material-symbolic approach is represented among the red wolf themes. The characterization of this species as gentle and "American" offers strong illustrations of this. Each theme can be found in Figures 3.1 and 3.2, respectively. Cox (2007) notes that human communication is interested; that is, it reflects the interests of the communicating party. The zoo's portrayal of the wolves as being gentle is likely a deliberate attempt to combat the perspective of the wolves as predators that should be eradicated to protect human interests. The wolves' moniker as "American" red wolves also paints the wolves as being symbolic of this nation. Therefore, American guests are likely to associate these animals with patriotism for their country. However, the wolves' framing did not always align with past research on the material-symbolic approach. Adams centers his 2012 study on the use of animals for political advocacy and other human-centric messaging and the potential harm that this can have on the animals involved. As mentioned earlier, the zoo highlighting the red wolves' range likely does not endanger this species. Americans who visit this American zoo are likely to view their nationality proudly and might connect this to the wolves.

In its discussion of the threats that surround gorillas, the gorillas' dependency on humans, and the gorillas' behavioral similarities between others in their species and humans, the zoo offers pertinent signs and plaques that embody mediation theory. Rogers (1998), Carbaugh (1999), Carbaugh (2007), and Plec (2012) are once again evoked through discussion of the

gorillas as victims of agriculture, disease, poaching, and mining in their shared suggestion that humans have a dialogical relationship with the earth. Such a relationship involves paying attention to its communicative patterns, understanding humanity's place within our shared environment, and meeting the needs of the earth. The material origin of the gorillas' discursive representation is specifically brought to attention by Callister (2012). Through the lens of her theory, the diminishing gorillas are transcribed into discursive descriptions of the crises surrounding them. The sign found in Figure 3.19, by listing the plights faced by the gorillas, illustrates alignment with this past research. This sign's creation hinged on humans first noticing that gorillas were being hunted for illegal bushmeat, were losing their habitat, and were succumbing to infectious diseases. These issues' material realities were then transcribed into text. As a result, guests are encouraged to be knowledgeable on these issues and to counteract them where possible.

The theme of connecting gorilla and human behavior powerfully illustrates the material-symbolic approach. In what is seemingly an attempt to encourage guests to identify with the gorillas, the zoo shares its gorillas' life stories in a format that mimics human biography. (This sign is found in Figure 3.5.) This communication style reflects the zoo's interests of educating guests and entertaining them. In other words, it is interested (Cox, 2007). Additionally, the sign in Figure 3.5 defies Adams' (2012) worry that projecting human views onto animals might result in animals being implicated in human struggles that they have no involvement in. The zoo is instead able to apply human life narratives, such as where one was born, to gorillas so that guests might become endeared to them. Guests, seeing parallels between human and gorilla behaviors and life circumstances, are probably more likely to pay attention to gorilla conservation initiatives and the needs of the gorillas at the zoo.

German cockroaches are connected to mediation theory through their portrayals as hazardous animals and opportunity seekers. Their presence at the zoo, and efforts to recognize and eliminate it, aligns darkly with Roger's (1998) plea that humans build a dialogical relationship with other species; Carbaugh's (2007) understanding that environmental communicators must listen to the human and nonhumans inhabitants of the earth; Callister's (2012) observation that discourse surrounding nonhuman animals originates from their bodies; and Plec's (2012) insistence that humans pay attention to the rhetorical energy of animals. While each author speaks on connecting with the nonhuman world and helping life to flourish, here the zoo's aim is to destroy it. Illustrating this is a comment in Figure 3.33 that lists insects to be targeted by "Alpine WSG 499-561." The list is comprised of: "Misc Insect, Occasional invader, Cockroaches, German Roaches." As shown, this list includes German cockroaches; the intention behind identifying them is to harm them with pesticide. The dialogical relationship described in prior research has been subverted here to bring harm instead of health.

German cockroaches and their twin themes align with the material-symbolic approach through Cox's (2007) insights about the interested nature of the zoo. Because the zoo has standards regarding cleanliness, the cockroaches are portrayed as being hazardous and as being unwelcome opportunists. The zoo's perspective is illustrated in Figures 3.25 and 3.26, respectively. In Figure 3.25, it is noted that part of the service agreement between the zoo and Ehrlich is that a service specialist must determine if insects are present and if structural deficiencies must be resolved. Figure 3.28 highlights the relationship between the zoo's concerns about sanitation and the duty of managing pest species. In a comment at the top of the manual, a service specialist plans on meeting with zoo personnel because "an exchange forum on pest management and sanitation concerns directly" relates to a pest management program's success.

As opposed to the gorillas, wolves, and humans, the cockroaches are found in the zoo's communication to be a species that must be kept out.¹⁴

Regarding humans, mediation theory is strongly present in signs that ask guests to develop an awareness of humanity's detrimental effects on wild animal populations. Such pleas bring Rogers (1998), Carbaugh (1999), Carbaugh (2007), Callister (2012), and Plec's (2012) arguments to the fore. Perhaps this is most effectively illustrated in Figure 3.18's sign which points to the effects of coltan mining on wild gorilla populations. Understanding that gorillas are affected by this practice and that humans should recycle their electronics to reduce mining requires that humans first acknowledge the diminishing activity of gorillas. Guests, of course, largely become aware of this through the works of researchers who observe and document the decreasing activity of gorillas. However, it should be noted that service specialists use the skills described above to target and eliminate German cockroaches. But this human-caused destruction is held as warranted. The document found in Figure 3.25 illustrates this process from the perspective of Ehrlich and its service specialists. A specialist "evaluates sanitation and structural deficiencies conducive to a pest infestation. Any area of concern is detailed on the service report" that they will file.

The zoo's institutional philosophy is revealed through human portrayals as benefactors to zoo animals and as restorative heroes to wild populations of animals. As a result, Cox's (2007) insight concerning the material-symbolic approach is present as these two portrayals embody the zoo's goals of educating guests on conservation issues and entertaining them. Figure 3.6's plaque notes that the Gorilla Nursery was a gift from Mr. and Mrs. Ross Faires. In doing so, it informs

¹⁴ In some instances, cockroaches are purposefully kept in the zoo's environment. This can be seen in Zoo Knoxville's "Name a Cockroach After Your Ex" event that allows those who participate to name a Madagascar hissing cockroach after a past significant other or "ex." See Hill (2023) for more information. More so, the Lincoln Park Zoo has an exhibit dedicated to these animals (Lincoln Park Zoo, 2023).

guests that, by donating to the zoo, they can contribute to an exhibit housing gorillas. Similarly, the plaque in Figure 3.1 portrays the zoo as working to prevent red wolves from going extinct. Guests are likely entertained by the image of the female wolf and her offspring and are also made aware of the imperiled status of the species.

Research Question One

Below is the answer to research question one as it concerns framing.

Threats appear to be framed differently depending on whether or not a species is part of the zoo's animal collection. Both red wolves and western lowland gorillas are critically endangered species, and the signs around them consistently alert guests to the threats impacting these animals. Most of these threats are noted as being human-caused. Figure 3.3's sign reveals that wolves nearly went extinct in the 1900s due to humans purposefully eradicating them. And, as seen in Figure 3.19's sign, the gorillas are hunted for bushmeat and lose their habitat to human expansion. Importantly, the zoo positions each of these events as a loss. Such circumstances are viewed as unnatural and in dire need of cessation. However, the German cockroaches' eradication is portrayed as a duty that must be carried out. This is shown in the "Hay Barn" comment from Figure 3.31 which asks that, presumably, the cockroaches' entry into one of the zoo's facilities be blocked. There are no signs or plaques dedicated to these animals. Communication discussing them is largely, if not completely, limited to private documentation between the AZA, Zoo Knoxville, and Ehrlich. As a result, the cockroaches are attacked out of the sight of the public eye.

The zoo uses elements of endearment to persuade guests to these perspectives. Perhaps guests associate wolves with being apex predators and livestock killers. The zoo, to counter these perspectives, portrays the wolves as being vulnerable and family-oriented. The image of the wolf

and her offspring, found in Figure 3.1, is likely analogous to the way that a human mother might bond with her infant. The gorillas, in Figure 3.5, are also portrayed through a lens of human-like activities, such as being born within named organizations, enjoying spending time with their siblings, and being protective of their offspring. The cockroaches receive no such attractive characterizations. Service specialists, as seen under Figure 3.25's "Insect Management" header, identify cockroaches as being attracted to unsanitary conditions and as entering facilities through unsealed crevices. In accordance with the trends identified above, it is noticeable that the more human-like a species is, the more popular that species seems in relation to exhibit size. (German cockroaches, as insects, are not given an exhibit nor are compared to humans; the red wolves, mammals, receive a total of three signs and plaques and have two that relate the wolves to humans; and the gorillas have a total of 21 signs, five of which relate them to humans.)

In summary, threats to species survival are framed as a loss when the species is part of the zoo's animal collection, such as the wolves and gorillas. In this study, animals that are not part of the collection are required to be destroyed. In order to help guests reach these conclusions, the zoo builds connections between humans and its collection animals by highlighting similarities in both species' behavior and life occurrences. The cockroaches, lacking the status of a collection animal and being deemed as pests by the zoo (and also the public as well), are quietly discussed, are devoid of endearing characterizations, and are actively harmed instead of wept over.

Research Question Two

Below is the answer to research question two as it concerns framing.

Humans are frequently discussed as causing both harm to nonhumans and as bringing them aid. Cockroaches are characterized as being animals that must be restricted from zoo structures, presumably for their ability to amplify the hazards and filth inside of the structures.

This is shown in the “INT The Bird Show” comment in Figure 3.29. Wolves are suggested to be gentle parents, as seen in Figure 3.1. And gorillas, as Figure 3.13 reveals, are described as, usually, only becoming aggressive when incited. Humans, however, are specifically listed in *both* the positive and negative terms listed above. This emerges through framing that instructs guests on how to manage their behavior when navigating the zoo and on how to alter their behavior to bring about the flourishing of the animals that the zoo chooses to house and enact conservation efforts for.

Guests are encouraged to develop an awareness of threats that animals face in the wild and what can be done to contribute to the welfare of the zoo’s animals. The human-caused plights of the wolves and gorillas are also central to the zoo’s signs and plaques. Such plights are illustrated in the sign found in Figure 3.19. Guests are notified that, in the wild, the gorillas contend with poaching, habitat loss, and deadly diseases. Guests are also encouraged by such signs and plaques to develop an awareness of threats that face animals in the wild. They are asked to cultivate an awareness of nonhuman animals when the needs of the zoo’s collection animals are brought to attention and when guests are provided with information on animal behavior. The former can be seen in Figure 3.6’s Gorilla Nursery plaque. Mr. and Mrs. Ross Faires are thanked for providing the gorillas with this addition to their zoo habitat. This serves as an invitation for other zoo guests to take notice of the needs of the collection animals and to provide support. The latter arises in the interactive sign of Figure 3.10. Here, guests are challenged to build awareness of the communication habits of African forest animals.

Ultimately, the zoo’s communication regarding humans largely differs from its communication on nonhuman animals because zoo plaques, signage, and documentation places

more emphasis on the human role in the communicative relationship between humans and nature.

Theme Summary: Ideology

In seeking to understand the communication surrounding the red wolves in terms of the zoo's ideology, there were three themes that emerged. The first theme appeared when the conservation of the red wolf population was brought to attention. The second theme focused on the identifying features of the red wolves. A final theme occurred when red wolves were brought to attention as gentle animals.

Concerning the gorillas, four ideological themes emerged. One theme focused on humans making donations to the zoo on behalf of its gorillas. A second theme arose when gorilla behavior was brought to the attention of guests. A third theme highlighted the various dangers that surrounded gorillas and how humans can combat them. A final theme appeared when humans were asked to be attentive to the behavior of the animals that surround them.

German cockroaches had six themes surrounding them. The first theme emerged when attention was brought to the goal of service specialists and zoo personnel to prevent German cockroaches from forming habitats, being attracted to water and debris, and creating an infestation on zoo grounds. The second theme surfaced whenever German cockroaches were brought to the attention of service specialists and zoo personnel: those who are watchful of their behavior and who wish to eliminate them from the zoo grounds. The third theme centered on the different methods of eliminating German cockroaches. The fourth theme surrounded the service specialists' concerns that German cockroaches could enter a structure. A fifth theme surfaced when attention was brought to the zoo personnel's ability to prevent German cockroaches from

building habitats on zoo grounds. Lastly, a theme emerged surrounding service specialists' ability to prevent German cockroaches from forming habitats on the zoo grounds.

Five themes surrounded humans. The first theme arose when attention was brought to the improvements that humans can make towards their treatment of animals. The second theme emerged when attention was brought to individuals and companies who made donations to the zoo. The third theme was found when attention was brought to humans developing awareness of animal lives. The fourth theme appeared when attention was brought to human-related threats faced by animals. The final theme emerged when attention was directed to the activity of preventing cockroaches from being able to make habitats on zoo grounds.

Theme Interpretation: Ideology

Mediation theory has a significant role in the red wolves' placement within the zoo's ideological system. A strong instance of its usage is found in Figure 3.3's sign and its focus on identification; this sign teaches guests how to distinguish between the red wolves and other species of wolves. To do this, it offers the wolves' fur color and range. In doing so, the sign embodies Rogers (1998), Carbaugh (1999), Carbaugh (2007), and Plec's (2012) statements regarding the importance of cultivating awareness of the nonhuman world. Additionally, Callister's (2012) findings are evoked due to the fact that, in order to identify the wolves, a human must first have observed them in their natural habitats.

Similarly, the material-symbolic approach was present among the wolves' themes, particularly in the theme of conservation. Cox's (2007) observation that communication is imbued with the values of the groups and organizations that craft it is recognizable in Figure 3.1. This plaque confronts guests with the value of efforts being taken to preserve the wolves by portraying these animals as gentle. It includes an image of a female wolf and her offspring likely

to persuade guests that the wolves are not all that dangerous. Instead, they are peaceful and family-oriented animals who just want to be safe. Next, the plaque champions the zoo's values of preventing the wolves from going extinct. It does this by thanking the organization for the work that it has done to save this species. These persuasive measures justify the zoo's work with a captive wolf population and its goal to bring this animal back from the brink of extinction.

Much of the existing work on mediation theory, that has been discussed in this chapter, also applies to the gorillas; a strong example of this is seen in efforts aimed at assisting guests with cultivating an awareness of animal communication styles. Figure 3.10's sign, for instance, requires that guests interact with the theories of Rogers (1998), Carbaugh (1999), Carbaugh (2007), and Plec (2012). In this sign, guests are asked whether or not they can understand the sounds of an African forest. On the sign, two buttons, with labels located underneath them, provide examples and interpretations of gorilla communication. Interacting with this sign allows guests to further immerse themselves within the gorillas' exhibit and to be both entertained and invested in the critically endangered gorillas due to these insights into their behavior. Callister's (2012) findings are also evoked here. A human, or several humans, had to take notice of gorilla communication and transcribe it. In the end, this sign uses mediation theory to guide guests in understanding the gorillas and the elements of their communication.

Cox's (2007) discussion of the material-symbolic approach illuminates the zoo's focus on conservation and how it emerges in the zoo's communication. Figure 3.5 presents a strong example of this by offering guests the names of the zoo's gorillas, their personalities, their places of birth, and their appearances. Knowing this information assists guests with forming a connection with the gorillas on a personal level. This entertains guests. It also helps guests to feel concern about the species as a whole, which assists with their conservation. Milstein's (2011)

findings, which note the importance of getting to know animals as individuals in order to connect with them, align with this.

The prior research on mediation theory is also apparent in the zoo's documentation on German cockroaches. Particularly notable examples are shown in relation to service specialists' concern that cockroaches can access the zoo and the specialists' ability to prevent cockroaches from forming habitats on the zoo grounds. Only Callister's (2012) findings align with these themes. Each of these instances began as a material reality and then was transcribed into a discursive form. Comments like the first two labeled "Ext Great Apes," found in Figure 3.31, note situations that would attract cockroaches into a zoo facility and that would allow them to enter. It is clear that pest species, including German cockroaches, are expected. However, the identification of the zoo as an ideal habitat for the cockroaches is reliant on the dialogical relationship between humans and nature that is described by Rogers (1998), Cabaugh (1999), Carbaugh (2007), and Plec (2012). However, Figure 3.33 illustrates how subverted the application of this principle is when placed in connection with cockroaches. The document here identifies cockroaches for the purpose of eliminating them as opposed to fostering their wellbeing. The service report describes the use of Nyguard as a "Preventative treatment for cockroaches and other pests." This contradicts the life affirming uses of mediation theory discussed in prior research.

The German cockroaches' documentation also possesses connections to the material-symbolic approach. A significant one arises in zoo personnel's ability to prevent German cockroaches from building habitats on zoo grounds. This is illustrated in Figure 3.31's "Hay Barn" comment. This comment features the zoo's service specialist crafting a message for zoo personnel: "Pipes extending [*sic*] through wall allowing [*sic*] pest access. Please fill in gaps

[sic] between pipes and wall [sic] to prevent pest entry.” This message to zoo personnel is a reflection of Section 2.8.1 of the AZA’s “2023 Accreditation Standards & Related Policies” which states the zoo’s intention of protecting its guests, staff, collection animals, and surrounding wildlife from pest species. This directive coincides with Cox’s (2007) argument that organizational communication is interested. This comment ultimately illustrates that zoo personnel also have significant responsibility in preventing German cockroaches from thriving at the zoo.

As with the other species, mediation theory plays a significant role in the documentation, plaques, and signage concerning humans. In the zoo’s plaques and signage, there is much acknowledgement of the harms that humans cause animals. Rogers (1998), Carbaugh (1999), Carbaugh (2007), and Plec’s (2012) arguments are particularly present in signs like the one in Figure 3.18. Humans mining for coltan and devastating gorilla habitat directly aligns with teachings that ask humans to give attention to the voices of nonhumans. Here, the gorillas’ voices are diminished through their weakening presence. This diminishment is documented, which aligns with Callister’s (2012) argument. However, a subversion of the first wave of theories discussed above occurs with the communication on German cockroaches. The voices of cockroaches are listened to so that they can be silenced. Figure 3.31 contains a comment, labeled “Tool Room,” that details the possibility of pest species, including the cockroaches, entering into one of the zoo’s facilities. The comment notes debris as “collecting under storage shelves” and zoo personnel as needing to “remove debris to prevent unsanitary conditions and attraction by pests.” The service specialist who notes this information uses a relationship with the pest species, largely founded on the principles of mediation theory, to prevent those species from thriving in one of the zoo’s facilities.

All zoo communication is intertwined with Cox's (2007) observation that organizational communication is interested. However, a notable example of this can be seen in the zoo's attention to the improvements that humans can make in terms of their treatment of animals and the environment. This interest primarily manifests through material dedicated to conservation. The sign in Figure 3.11, through its discussion of the importance and vulnerability of forests, excels as an example of this. The sign reads, "Why protect the forests? They are home to plants, animals and people. They clean the air and are filled with wonder. Can you imagine life without forests?" The zoo is dedicated to educating guests on the importance of caring for the environment and not letting the animals who rely on it go extinct. The zoo uses its signage and plaques to direct guests on how to improve their treatment of other animals and the environment; thereby, the zoo helps to preserve both humanity and the other parties' health. It enacts its goal of convincing guests of the reasons for conservation initiatives.

Research Question One

Below is the answer to research question one as it concerns ideology.

Red wolves, western lowland gorillas, and German cockroaches are highlighted by the zoo for specific purposes; none of this study's species go unnoticed. However, species characterizations differ considerably between that of German cockroaches and that of red wolves and western lowland gorillas. The cockroaches are discussed as being unwelcome animals that must actively be deflected from entering into the zoo's spaces by zoo personnel and the service specialists who have been contracted by the zoo. This is illustrated beneath the "Insect Management" header in Figure 3.25. The themes surrounding the wolves and the gorillas reveal that they are targeted by the zoo for entirely different reasons: conservation, and even more specifically, preservation against destructive human behaviors. The wolves are presented, in

Figure 3.3, to be in the midst of conservation efforts aiming to undo an extinction crisis that took place in the 1900s. Similarly, the gorillas are encompassed by material that often centers on the threats that surround them. An illustration of this is the sign in Figure 3.20. The sign offers the impact that the commercial bushmeat trade, the spread of infectious diseases, and the practice of logging have had on the gorillas. Accompanying this information are statements that offer suggestions for human intervention.

Species are described in terms of identifying traits. The red wolves, in the sign found in Figure 3.3, are given ample attention in regards to their reddish brown appearance and their size in relation to other wolf species. The practice of understanding gorilla staring, as seen in Figure 3.12's sign, is also given attention. Giving their attention in these areas likely brings guests closer to promoting the conservation of each species. Guests can differentiate red wolves from gray wolves and identify which species of wolf is close to extinction. Guests can also feel that they have a behavior in common with gorillas. This connection could inspire them to protect the species. In a similar vein, service specialists are noted as performing inspections that require attentiveness to the behavior of cockroaches. This is illustrated in a Figure 3.25 comment, which says that "Your Service Specialist evaluates sanitation and structural deficiencies conducive to a pest infestation. Any area of concern is detailed on the service report filed in the Pest Management Program Service Manual." However, this behavior does not lead to the health of the animals but their destruction.

Species that are targeted by the zoo for conservation purposes are described or shown in relation to positive human traits. These illustrations of species behavior are more points of divergence between the treatment of the red wolves, western lowland gorillas, and German cockroaches in the zoo's communication. The wolf and gorilla characterizations often include

parallels to human behavior. For example, the wolves are portrayed in Figure 3.1's plaque as being gentle parents. The lives of the zoo's gorillas are made more analogous to human lived experience in the biographical sign of Figure 3.5. The cockroaches are privately described in terms of their presence and its potential for infestation, as is illustrated in the "Int The Bird Show" comment in Figure 3.31.

In summary, none of the nonhuman species discussed above go unnoticed by the zoo. However, this institution has different aims for, and ways of interacting with, each group of nonhuman animals. The animals' prominent traits and behaviors play a role in the zoo accomplishing its goals for each species. For wolves and gorillas, this means highlighting positive attributes that they may share with humans to, seemingly, promote guest interest in their conservation. For cockroaches, this means adhering to the perspective that the insects must be eliminated to maintain a safe environment for species that the zoo desires to be on its grounds.

Research Question Two

Below is the answer to research question two as it concerns ideology.

When it comes to answering the second research question, there is a singular trend: humans are portrayed as choosing to either harm or protect nonhumans. Plaques honoring human benefactors of the gorilla exhibit, as well as the "General Comments" section of the service report, bring this thread into focus. The plaque found in Figure 3.7 is one such plaque. This plaque, which honors the Pilot Corporation's contribution to the Gorilla Overlook, offers an example of humans noticing the needs of the animals in the zoo and aiding them. The "General Comments" section in Figure 3.34 showcases the zoo's service specialist stating that they "Checked [*sic*] logbook [*sic*] for pest sightings. Treated [*sic*] areas where the pests were listed."

In the case of the zoo's gorillas, they are receiving comfort from humans. In the case of the cockroaches, they are being threatened by humans.

Humans are treated similarly to gorillas in that there is an emphasis on both species possessing awareness placed on signs and within documentation. Humans, in the interactive sign of Figure 3.10, are described as needing to develop awareness of the ways that different nonhuman animals communicate, specifically gorillas. While this sign considers them deficient at identifying nonhuman communication in African forests, the sign's purpose is to teach them. In another genre, service specialists are described as being particularly attuned to pest species. This is shown in the "Ext Upper Admin" comment in Figure 3.31 which cautions zoo personnel that not trimming vegetation might allow pests to enter their facility. Similarly, gorillas are described as noticing human staring in Figure 3.12's sign. The signs in Figures 3.22 and 3.5, also portray gorillas as having an awareness of human behavioral patterns, such as behaving politely when visiting a house that is not your own, and narratives that humans use, such as biography.

Humans, in the zoo's communication, are not explicitly tied to any environment. However, the placement of humans is alluded to in some signs throughout the two collection animals' exhibits. One instance is in Figure 3.3's sign where the red wolves are mentioned as being native only to the United States. As mentioned above, this information seems to assume that guests will hold interest in this fact, likely making them American. The sign in Figure 3.10 also assumes that humans cannot interpret the communication styles of animals in an African forest. Perhaps humans who lived in an African setting could do so. Lastly, the lack of information concerning a specifically human environment or range helps the zoo to enforce its message that humans should be concerned about the issues surrounding animals in the wild. Many of these issues are human-caused, disclosing that the entire planet is a potential habitat for

humans. This provides a similarity to one species: the German cockroaches. Cockroaches are also not tied to a particular location. They migrate with humans.

The portrayal of humans is also similar to the cockroaches in another way. While the cockroaches' behaviors are not overtly recognizable as human-like, the portrayal of the cockroaches does mirror the destructive behavior described as belonging to humans. (The threatening behaviors that humans enact can be seen, in part, in Figure 3.19. The destructive presence of cockroaches is alluded to under Figure 3.25's "Insect Management" header.) But importantly, the cockroaches are limited to the threats that they pose to the zoo's facilities, its staff and guests, its animal collection, surrounding wildlife, and human dwellings in general. Human-caused destruction has a much wider, planetary, reach.¹⁵

In closing, humans are treated distinctly from the nonhuman animals in this study in relation to the amount of power that they possess to fulfill the needs of the animals that the zoo chooses to help flourish and to eliminate animals when the zoo's ideology deems it necessary to do so. This requires awareness of the behaviors and situations surrounding other species, which humans seem to share to some degree with gorillas. Humans, like the cockroaches, also have no singular habitat and are associated with degrading their environments; however, humanity's power likely makes it more urgent that they develop an awareness of how other species live so that they can promote their flourishing and reduce humanity's own destructive impact.

Theme Summary: Salience/Erasure

The salience and erasure themes surrounding red wolves, western lowland gorillas, German cockroaches, and humans were largely congruent. This study found that each species had three or more themes with the following elements: activeness, abstraction, specificity, and passivization.

¹⁵ As noted earlier in this chapter, German cockroaches appear in human facilities all around the world. They do not dwell in the wild. With this being said, they do not pose a significant risk for the earth's nonhuman environments. See Tang et al. (2018) for more information.

As the names may have alluded to, the first theme emerged when attention was brought to whether or not a species was portrayed as being active agents in a text. The second was present when attention was brought to whether or not a species was treated abstractly in a text. Similarly, the third theme appeared when attention was brought to how specific descriptions were of a species. Lastly, the fourth surfaced when attention was brought to whether or not members of a species were portrayed as being passive recipients of actions.

The red wolves' signs and plaque produced the first three themes. The western lowland gorillas' signs and plaques, as well as the German cockroaches' documentation, also brought forth these three themes. Lastly, all four themes were found in connection to humans.

Theme Interpretation: Salience/Erasure

Prior research on mediation theory notably aligns with the specificity surrounding the red wolves. Rogers (1998), Carbaugh (1999), Carbaugh (2007), Plec (2012), and Callister's (2012) arguments are seen in Figure 3.3's sign. This sign notes that "Red wolves are known for their reddish-brown color along their backs." In order to enter into an ideological relationship with nonhumans, which is advised by the first four authors listed above, one must first identify the species that they are interacting with. Callister's (2012) findings, that discursive representations of animals result from their material bodies, is also quintessential here. A human identified red wolves and wrote a description of them based on that observation, ultimately resulting in the sign in Figure 3.3. By noting that the species being discussed is "Red wolves," the zoo enables a dialogical relationship between guests and these animals. However, this is noticeably subverted when the wolves are discussed abstractly, such as in Figure 3.2. Here, the red wolf is referred to as an "animal" who is "part of a Species Survival Plan." The nonspecific language results in the

dialogical relationship being nearly nonexistent due to there being little detail listed describing the species.

The material-symbolic approach also has a place in the red wolves' plaque and signage in relation to salience and erasure. A particularly strong example relates to activeness and is shown in the sign located in Figure 3.3. Cox's (2007) statement that organizations produce material that aligns with their viewpoints emerges from this study's findings. Here, it is shown that "The Red Wolf is the only species of wolf native to the United States alone." This sign highlights the wolves' native range; thereby, educating visitors on a vein of agency that this species possesses in its origin. The species origin is implied to be a process that arose amongst wild agents.¹⁶ In sum, the species' origin occurred in the natural world and was not a direct product of human creation.

Additionally, there is some agreement between the western lowland gorillas and Rogers (1998), Carbaugh (1999), Carbaugh (2007), Plec (2012), and Callister (2012). The sign in Figure 3.13, for instance, provides a clear example of this by discussing the activeness and agency of the gorillas. It says, "Troops are led by one dominant, older adult male." In addition to illustrating the agency of these animals, this sign relies on human observation of gorilla behavior and the transcription of that observation. Ultimately this sign reveals to zoo guests that gorillas possess agency and organization among themselves.

There is also a strong connection between Cox (2007) and Milstein's (2011) insights and the plaques and signage surrounding the gorillas. Perhaps this is best illustrated in the sign found in Figure 3.5 and its relationship to specificity. In this sign, the zoo is specific about the individual names of its gorillas and their appearances. An example of this surrounds a gorilla named Obi. The sign reads that Obi "has a lanky build and notably red hair." Knowing this

¹⁶ More information on the origin of red wolves can be found in Sacks et al. (2021).

information about Obi's appearance helps guests to be able to more fully understand her life and to ultimately form a connection with her (Milstein, 2011). Through her, guests may care more about the plight of gorillas in the wild. This fulfills the goals of the zoo to educate guests on conservation issues and to entertain them (Cox, 2007).

The German cockroaches' connection to Rogers (1998), Carbaugh (1999), Carbaugh (2007), Plec (2012), and Callister (2012) is well illustrated in the animals' activeness. An example of this is located in the document found in Figure 3.25. Under the header "Insect Management," it is written that "The facility is inspected to determine if insect activity or evidence is present." The service specialists understand that the cockroaches are agents and document them as being such. However, the intent is not to engage in a dialogical relationship with them that promotes their flourishing. It is instead to eliminate them from the zoo environment.

Prior research surrounding the material-symbolic approach also has alignment with the German cockroach findings of this study. Cox (2007) notes that organizations abide by their institutional aims. This practice aligns with the zoo's infrequent specificity concerning German cockroaches. In much of the documentation that they are featured in, they are referred to abstractly. The service report in Figure 3.30 illustrates this by saying that zoo personnel should "remove debris to prevent unsanitary conditions and attraction by pests." The cockroaches are one pest species in a multitude that enter zoos.¹⁷ The abstract language found here in the word "pest" likely allows the pest control company, Ehrlich, to discuss a variety of animals at once without the need to list out each species specifically.

¹⁷ Hematophagous flies and mosquitoes, for example, also frequent zoos. See Adler et al. (2011) for more information.

Prior research on mediation theory contrasts with this study's findings on the portrayal of humans in zoo signage. Rogers (1998), Carbaugh (1999), Carbaugh (2007), and Plec (2012) highlight the fact that humans have the ability to have a dialogical relationship with animals. However, human actors are sometimes omitted from a text; in other words, information surrounding them is passivated. An example of this is located in Figure 3.18. Discussing how mining for coltan destroys gorilla habitat, the sign reads that "It [coltan] is mined in the Democratic Republic of Congo, which is also the natural habitat of endangered gorillas." However, who is doing the mining? This is not stated. The result is that the focus is placed on the perishing gorillas and what guests can do to end the mining. No particular individual or entity is targeted to be blamed for the immediate destruction. The sign places the gorillas' deaths due to coltan mining in focus and directs guests' attention to their own ability to save gorillas by using electronics longer and then recycling them. While guests reading about gorilla responses to coltan mining, and what can be done to end this fatal practice, places them in a dialogical relationship with gorillas, the relationship between the gorillas and the humans actually doing the mining is largely nonexistent in the sign. It is worth asking how, specifically, those individuals interact with the gorillas.

Lastly, this study's findings regarding humans and salience and erasure align with prior research through Cox (2007). The zoo often utilizes abstraction when discussing humans because it likely has an interest in appealing to all members of the public. In order to avoid narrowing their demographic to only a few groups, they often refer to guests as "you." An example of this can be found in Figure 3.2's sign. In reference to the red wolf Species Survival Plan, the sign states that "When you visit a zoo or aquarium with the AZA logo, you support an organization dedicated to the care of its animals." A wide range of zoo guests are addressed in this statement.

Here, being abstract is more practical to achieve the zoo's aim to educate visitors on conservation initiatives. A similar example appears in the sign found in Figure 3.16. This sign answers a critical question that guests may have: "What can you do for the forest? Leave only footprints, take only memories and pictures." Again, this sign is addressed to "you." Being abstract allows the zoo to appeal to guests regardless of individual or group identity.

Research Question One

Below is the answer to research question one as it concerns salience and erasure.

Specificity surrounds both the wolves and the gorillas. Both species have signs that convey their conservation status. Examples of these are shown in Figures 3.3, 3.12, 3.13, and 3.20. These "Status in the Wild" signs offer their species' scientific name. The gorillas have three of these signs while the wolves have only one. Additionally, the gorillas possess signs that refer to them by their proper names and that refer to their different positions within a troop. (See Figure 3.5 for the first of these and Figure 3.13 for the last.) As a result, the gorillas are more salient than the wolves. With their species name mentioned four times (which is dwarfed by descriptions of the cockroaches, presumably, being included in the numerous references to "pests" and "insects"), the cockroaches are provided with perhaps a smaller amount of salience than the wolves. Ultimately, knowing the species names of the wolves and gorillas aids guests with knowing which animals need to be protected. Knowing the species name of the cockroaches helps zoo personnel and service specialists to know which species to target.

While the wolves and gorillas each possess a number of instances of specificity, they each also possess at least one instance of abstraction. This moment of abstraction occurs in the SSP signs where they are deemed as: "animal," "animals," "species," and "wildlife." Apart from the SSP sign, gorillas are portrayed through abstraction in four more signs. These, too, refer to

them as “animals.” These signs are found in Figures 3.10, 3.11, 3.14, and 3.16. Abstractions are likely utilized for convenience in these situations. The zoo can use the same sign template for multiple species. The cockroaches, meanwhile, have a multitude of abstractions. These include the words and phrases: “pest,” “pest trending,” and “pest sighting,” etc. These terms are found both in the pest management manual and in the service report. This use of abstraction is also likely for convenience. Service specialists are able to speak on more than one pest species at a time.

The wolves and gorillas were also similar when it comes to activeness. They were both portrayed in their “Status in the Wild” signs, those found in Figures 3.3, 3.12, 3.13, and 3.20, as possessing agency. Once again, the number of signs inside of the wolf exhibit gives gorillas an advantage over the wolves in this area. In addition to the three status in the wild signs that the gorillas possess, they also have a biography sign, found in Figure 3.5, that illustrates their agency by describing the gorillas’ individual personalities and family bonds. In comparison, the cockroaches are found to have very few comments where agency is directly ascribed to them. However, one comment in Figure 3.25 of the manual, states that “The facility is inspected to determine if insect activity or evidence is present.” Many comments instead note that compromised structures *allow* pest species to enter. The comment “RBS 020” in Figure 3.30 illustrates this.

Overall, it may be said that the wolves and gorillas are given platforms to share their agency in signs stating their statuses in the wild and disclosing their individuality. Cockroaches are attributed some agency in terms of their ability to enter the zoo’s facilities. The gorillas are given more opportunities for this than the other species due to their numerous signs. Perhaps the gorillas being primates, like humans, is the reason for the many engagement opportunities

surrounding them. There may be more potential for guests to relate to them. Specificity is used across species to bring attention. However, for the wolves and gorillas this brings a greater likelihood of conservation and for the cockroaches it heralds a more precise means of destruction. Lastly, abstraction appears among all three species' signs, plaques, and documentation—likely for the purpose of convenience.

Research Question Two

Below is the answer to research question two as it concerns salience and erasure.

Humans are treated similarly to the cockroaches, gorillas, and wolves in that they each are portrayed with activeness and agency. One example of this is Figure 3.19's "The African Apes" sign. At two points, this sign provides information on human behavior in nearly the same way that "Status in the Wild" signs provide information on the behavior of nonhuman animals. For example, this sign specifically notes that "hunters are paid high dollar for animal parts in African and Asian markets." This example illustrates the activeness and agency of humans in the same ways that "The Red Wolf" being "the only species of wolf native to the United State" and "Zoo Knoxville gorillas" being "like their relatives in the wild" illustrates theirs. It discusses elements of human existence or living where humans are in an active role.

Humans and gorillas are treated very similarly to each other on the subject of names. Both gorillas and humans are shown to hold proper names. This is best illustrated through the Gorilla Nursery plaque, found in Figure 3.6 and the gorilla biography sign, found in Figure 3.5. The Gorilla Nursery plaque features the proper names of the benefactors that it wants to praise: Mr. and Mrs. Ross Faires. Similarly, the gorilla biography sign lists the names of Zoo Knoxville's gorillas: "Ubuntu," "Andi," "Hope," "Kowali," "Bantu," and "Obi." The use of proper names sets these two species apart from the others in terms of salience as they allow for

an individualistic understanding of those being mentioned. However, while this form of specificity is unique in this study to gorillas and humans, organizational names are primarily only attributed to humans.

Humans also share a significant trend with the cockroaches: abstraction. Throughout the gorilla and red wolf signage, humans are discussed abstractly as “you” and “we.” Specifically in SSP signs, humans are addressed as “you” in reference to informing guests that when they visit a zoo that is a member of the AZA, they are supporting an institution that takes caring for its animals seriously. (This is seen in Figures 3.2 and 3.4). The cockroaches are frequently referred to abstractly as “pests” and “insects.” This is illustrated in the “Insect Management” section of the manual, in Figure 3.25, where it states that “The facility is inspected to determine if insect activity or evidence is present and to identify areas that require corrective sanitation and structural maintenance measures.” Both human and cockroach abstraction likely aids the zoo and pest control company. The zoo is able to appeal to a wider audience. Ehrlich is able to discuss a multitude of pest species without listing them.

Lastly, humans are often passivated whereas nonhuman animals are not. Instances of this can be seen in “The Great Apes” sign, in Figure 3.19, where one illustrative sentence says that “Roads are cut through ape habitat to gain access to the forest for logging and mining.” Human actions are described here, but the human agents themselves are missing. As opposed to calling attention to human agency, this section of the sign instead chooses to focus on the harmful practices that contribute to gorilla habitat loss. The same is true in Figure 3.18’s sign. The statement asks humans to recycle their cell phones in order to curtail mining for coltan, which damages gorilla habitat: “It is mined in the Democratic Republic of Congo, which is also the natural habitat of endangered gorillas.” The attention is given to the practice of mining instead of

being directed at the humans doing the mining. Again, this likely brings guests to think of their own responsibility in preventing this harm. The attention is diverted from the human actors who physically enact it.

Therefore, humans are highlighted as being active and as possessing agency like the other three species. Individual humans and their organizations have their names listed in order to be honored for the effort that they put forth for these animals. This differs from the proper name usage in the gorilla exhibit, which is to encourage a connection between the gorillas and humans. Humans are abstracted, similarly to the cockroaches in the pest management material, so that the zoo can reach a larger audience. This creates a distinction between the two species, as the cockroaches' abstraction is likely so that the zoo can target more pest species at once for destruction and to be prevented from entering its facilities. Lastly, humans who destroy the environment are omitted to seemingly prevent blame from being assigned directly to them. Instead, guests can ponder how they themselves plan to address the issues being described as opposed to assigning blame to another party.

With this being said, the results in this chapter answer the study's two research questions. These answers bring greater insight into how environmental communicators at the zoo constructed red wolves, western lowland gorillas, German cockroaches, and humans within the framework of their organizational identity. These answers also reveal how the environmental communicators engage guests, on the minute and macro levels of linguistic devices and broader environmental communication theory, to fulfill their organizations' aims of entertaining guests and educating them on conservation initiatives.

Having answered this study's research questions, I note the contributions that they make to the field of environmental communication in Chapter 5: A Reflection on Species.

Chapter 5: A Reflection on Species

The purpose of this study has been to distill the similarities and differences in how Zoo Knoxville communicates about red wolves, western lowland gorillas, German cockroaches, and humans. As a result, it has been concerned with the stories that emerge from the material dedicated to each species. In *Ecolinguistics: Language, ecology and the stories we live by*, Stibbe states that:

They [stories] appear between the lines of the texts which surround us in everyday life: in news reports, advertisements, conversations with friends, the weather forecast, instruction manuals or textbooks. They appear in educational, political, professional, medical, legal and other institutional contexts without announcing themselves as stories. (Stibbe, 2015, p. 5)

Such stories can quietly portray humans as being set apart from all other species or they can encourage the emphasis of commonalities between humans and other species. They can cast some species as being unworthy of attention or they can portray all species as being worthy of respect (Stibbe, 2015). This study's past chapters have highlighted the zoo's stories concerning multiple species in its environment. The zoo's engagement with individual words, semantic relationships, simple narratives, deep narratives, topics, repetition, comparison, euphemisms, hyponyms, hypernyms, activation, and passivization, and the larger ecolinguistic concepts that these devices comprise, form the basis of how species are experienced in the zoo—at least in relation to its discursive material. (Some experiences, after all, are not mediated.)

Larger environmental communication theories, such as mediation theory and the material-symbolic approach, also play a role in how guests interact with other species. Each species that has appeared in this study is portrayed according to the zoo's interests in educating

guests on conservation matters and entertaining them. Using mediation theory, the zoo has been shown to make it easier for guests to relate to species that achieve these purposes and to ignore species that do not. Often mediation theory was used, in contrast to its original intent as described by environmental communication scholars, to attack species instead of promoting their wellbeing if they fell outside the scope of this institution's aims. The zoo, ultimately, is designed for some species and not others.

Research Questions

This study's research questions have been: What are the differences, if any, in the linguistic treatment of nonhuman animals that are recognized as exotic, native, and pest species and what are the wider differences, if any, between the linguistic treatment of nonhuman animals and that of humans.

Concerning framing, the zoo utilizes several strategies that ultimately endear guests to red wolves and western lowland gorillas, critically endangered species whose possible extinction is held as a loss. These include portraying these animals as partaking in human activities and avoiding portraying either species in a way that guests might find revolting or morally reprehensible. On the opposite end of the spectrum, German cockroaches are portrayed as being rightfully destroyed. They are overwhelmingly characterized as being attracted to filth, hazardous, and able to infiltrate facilities. Humans, meanwhile, are characterized by their propensity for both praiseworthy and blameworthy behavior. They can cause the extinction of a species or contribute to its restoration. Aligning with this, human guests are encouraged to develop an awareness of the behaviors and needs of wild animals as well as the behaviors and needs of the zoo's collection animals.

Mirroring the answers above to some degree, the zoo highlights species according to their purpose within the zoo and its ideology. Because the wolves and gorillas are specifically placed within this zoo with a focus on conservation, they are described in terms of identifying traits that help guests to relate to them, such as red wolves being noted as the only species of wolf native to the United States alone and western lowland gorillas sharing the practice of staring with humans. Offering these facts seems to be a way of getting guests emotionally invested in these animals and more likely to be concerned about their conservation. There are also efforts to position wolf and gorilla behavior in human frameworks, such as portraying the gorillas as homeowners. None of these parallels include negative human behavior. The portrayal of German cockroaches is categorized by their being surveilled by service specialists and zoo agents and their status as a hazard within the zoo's institutional framework. Given the zoo's emphasis on destructive human behavior, there emerges a slight parallel between the characterization of the cockroaches as being placeless and destructive and the nearly totalizing and boundless destructive power of humans. Once again, humans are portrayed as being positioned to choose between harming and protecting other animals. Their awareness of how their interactions affect others aligns them with the gorillas, as shown in the latter's awareness of staring in other species. (Although the gorillas misinterpret human stares as being aggressive.)

The zoo appears to use salience and erasure to give guests a detailed understanding of the conservation statuses of endangered species, to convey messages succinctly without referring to individual species, to illustrate the agency of members of a species, and to seemingly prevent blame from being assigned to human actors who compromise wild animal populations. The red wolf and western lowland gorillas have prominent signs that list their species name in order to highlight which particular species is critically endangered and what conditions surround them.

The gorillas are also given proper names to likely help guests to bond with them. German cockroaches are only specifically identified when they are directly targeted for the use of pesticides. Specific groups of humans are sometimes referenced, particularly bushmeat hunters and loggers, as well as organizations like the Association of Zoos and Aquariums, to note who is carrying out an activity. At other times, specific individuals are referenced on plaques that praise them for their contributions to the zoo's collection animals. This use of proper names makes their presentation similar to the gorillas, although the gorillas' name use is to foster a bond and the humans' is to honor specific individuals. However, specificity is infrequent among signs referencing humans. Additionally, there are a couple of notable instances of abstraction among the wolf and gorilla signs that likely make it easier for the AZA to alert guests that a species is part of a SSP. Here, the wolves and gorillas are referred to as "animals." Similarly, the cockroaches are often referred to en masse with other pest species as "pests." Humans are treated similarly by being frequently referenced as "you" in order for the zoo to communicate with a wider audience. Each instance of abstraction is likely for convenience. The agency of the wolves and gorillas is illustrated in their ability to, for example, navigate territory and form relationships. German cockroaches are portrayed as being active in infiltrating the zoo's facilities. Humans are portrayed as being active, such as when they participate in conservation activities or environmentally destructive activities. Finally, humans are sometimes passivated unlike the other species. The blame is often removed from the immediate human actors and guests are encouraged to change their actions instead.

Research Contributions

This study has responded to two gaps in environmental communication research. The first is a lack of studies surrounding zoos. Specifically, this study aimed to provide answers to how

environmental communicators at a zoo treat species, who are dissimilar in their relationships to the zoo and its geographic location, on the level of linguistic choices and how these choices ultimately position animals—human and nonhuman. Mediation theory and the material-symbolic approach were central to understanding this positioning.

The other gap that this study sought to address is the dearth of collaboration between the field of environmental communication and the subfield of ecolinguistics (Milstein, 2012a). As suggested by the first research aim, ecolinguistics allows the linguistic elements that contribute to mediation theory and the material-symbolic approach to be examined.

In relation to conversations in environmental communication surrounding zoos, this study affirmed Milstein's (2012b) findings that zoos align communication events involving gorillas with human narratives. It also reveals that the use of this device is also present in text. Zoo Knoxville, in Figure 3.22, positions the gorillas' disturbance at having their exhibit glass tapped as these animals being similar to human homeowners. The gorillas' biography sign, in Figure 3.5, parallels human life events and converges meticulously with Milstein's statement that: "As intensive, public humanimal condensations, zoos as institutions strive to reflect animals in particular ways that are both culturally coherent and serve to justify zoos' continuing existence" (Milstein, 2012b, p. 163). Notably in signs that refer to Zoo Knoxville's gorillas, they are portrayed as being content and happy at the zoo. This was also shown clearly in Figure 3.12's sign when it shared that the zoo's gorillas watch their habitat like gorillas in the wild watch over their territory. In her own study, Milstein examined how after a gorilla banged on its exhibit in front of a human guide and a group of visiting children, there was a struggle over the meaning of the event. Some children stated that the gorilla might have wanted out of the exhibit, but the guide sought to convince them that the gorilla just wanted to entertain them. Milstein notes this

as an attempt by the guide to superimpose the zoo's perspective over the students' challenging perspective.

There were no struggles for meaning in this present study, but the idea of paralleling human and nonhuman storylines to affirm the zoo's existence also proved true for the zoo's red wolves. Their portrayal as gentle parents, in Figure 3.1, is sure to form parallels to human parenthood in the minds of guests and also assure guests that the zoo is needed to continue to save these animals from extinction. This sign also furthers research in this area by using imagery to convey its message, as opposed to spoken discourse.

On the other end of the spectrum, the zoo's treatment of German cockroaches aligns with the statements made by LeBaron (2012). She highlights that humans view themselves as being superior to other species and as being selective about choosing which species they value. LeBaron illustrates this point by narrating a day in her garden when she sprayed generations of squash bugs with a neem oil solution and squished them for inhabiting her vegetable garden. The act surprised her, as she writes that:

my killing was mostly individual; it felt brutal and visceral. It frightened me. Because the fact of the matter is that, if we didn't have conflicting agendas regarding zucchini plants, I'd have found them cute. The newborns are all spindly legged and they sort of hang out in a group as if unsure of the big world. And the older nymphs are the softest shade of dove gray. (LeBaron, 2012, p. 247).

She, as those in the zoo, monitored her environment and culled species that did not belong in her idea of this space.

German cockroaches, and the negative descriptions, or "stories," surrounding them, conflict with the zoo's values of providing an environment for guests to enjoy themselves while

also learning about conservation initiatives. German cockroaches, providing no ecological value and only contributing unsanitary conditions to human life, do not fit neatly into the zoo's overall story. However, it can be argued that knowing the cockroaches' history and behavior could provide guests with a deeper understanding of how these animals fit within life on this planet and perhaps could offer guests a greater appreciation for the animals that they encounter in their everyday lives—such as the cockroaches. The zoo's current silence concerning German cockroaches reveals the institution as a constructed environment, interested, and largely forgoing species who have adapted to depend on human environments for survival—specifically those considered pests.

This study, in examining the zoo's linguistic treatment of German cockroaches, using an ecolinguistic lens, mediation theory, and the material-symbolic approach, brings greater insight into the field about how environmentally-concerned institutions communicate about species that fall outside of their immediate interests.

Limitations and Future Research for Self

This study's first limitation surrounds the species categories that were chosen: exotic, native, and pest. Examining documentation, plaques, and signs relating to red wolves, German cockroaches, and western lowland gorillas brought together different relationships to geographic location within the zoo. The cockroaches, which are not collection animals, live within human settlements. The gorillas, which are collection animals, are not native to the continent where they are being exhibited. The wolves, which are also collection animals, are native to the continent where they are being exhibited. These different relationships were ultimately crucial to the zoo's overall characterization of each species, as can be seen in Chapter three and Chapter four.

However, other species categories should be explored to get a more thorough understanding of how Zoo Knoxville characterizes various nonhumans. For instance, this study did not focus on birds or reptiles either as collection animals or as noncollection animals who frequent zoo grounds. It also did not perform an in depth study on insects that are part of the zoo's animal collection and that are not labeled as pests by this particular zoo. Future studies could also consider more conservation statuses. Red wolves and western lowland gorillas were chosen for this study, in part, due to their critically endangered statuses. This reduced the disparity between these species. It may have, for instance, accounted for gorillas receiving more signage dedicated to cultivating guest awareness than the wolves if the wolves had a conservation status of least concern.

This study's second limitation surrounds guest perspectives. This study identified many trends among the zoo's signage, documents, and plaques. Many of these appeared to be aimed at causing guests to care about the fates of red wolves and western lowland gorillas, such as the sign that offered the gorillas' biographies in Figure 3.5 and the plaque that presented the wolf and cub sleeping beside each other in Figure 3.1. However, it is unknown what any of the zoo's guests actually experience when they view these materials. Interviewing guests would provide more clarity on how this messaging is interpreted.

An additional avenue of future research concerns signage fluctuating at the zoo. Signage can be retired at times. And, for some species, signage is seasonal. One illustration of this emerged in regards to the zoo's tortoise collection. In winter months, the tortoises are removed from their outdoor exhibits and signage is placed there to alert guests to the situation. One sign reads: "If Only Turtle Sweaters Were A Thing!" The words are accompanied by a realistic cutout image of a tortoise. In coming years, it is probable that the signage in the red wolf and western

lowland gorilla exhibits will be altered to some degree. It would be beneficial to perform a longitudinal study of these exhibits to observe if signage changed and if the overall message of the exhibit changed. And, if so, why?

Future Research for Field

It would be helpful for environmental communication scholars to pursue an ecolinguistics methodology in other contexts where animals are categorized. Examples of these could be pest control companies and their visits to customers' property as well as animal shelter fundraisers.¹⁸ Utilizing ecolinguistics will assist in understanding the underlying tensions that are experienced in a society where communities value nonhuman lives at varying degrees. Beyond identifying what these tensions are, an ecolinguistics methodology will reveal the use of linguistic devices that births these tensions into being. With the wider theories and concerns within environmental communications and the more minute elements available within ecolinguistics, the field of environmental communication and the subfield of ecolinguistics will prove to be a fruitful pairing.

Conclusion

In this study, I have addressed gaps within the environmental communication literature and identified how environmental communicators at the zoo modify their communicative styles when discussing species from different environments and with diverging categorizations within the zoo. This study has affirmed prior research on mediation theory and the material-symbolic approach in that the zoo categorizes animals based on its purposes of educating and entertaining its guests. It also uses elements of mediation theory to bond guests with endangered animals.

However, this study has also revealed that the zoo uses the practices found in mediation theory to

¹⁸ In the first situation, pest control specialists may treat companion animals differently than wildlife that accidentally encounters pesticide. In the second situation, it is possible that canines and felines will be revered while other species are dined upon unabashedly.

eliminate animals who are not considered suitable for this environment. Ultimately it has shown that humans, in language and deed, possess the power to preserve or eliminate other species.

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Appendices

Appendix A

Table 2.1 Framing Terms and Descriptions

Terms	Descriptions
Frame	Frames are scripts, schemas, and structures of expectation that allow us to recognize recurring narratives that are based on the roles of individuals and the elements that appear.
Individual Words	Individual words evoke frames and the relationships that exist within them.
Semantic Roles	Semantic roles are the positions held by participants in a given situation.
Simple Narrative	Simple narratives include more structure than frames, feature narrative archetypes, and elicit emotions from the reader that correspond with the nature of the events that they contain. They may also be particular to a culture.
Deep Narrative	Deep narratives mirror simple narratives, but they have the key difference of transcending cultural boundaries.

Table 2.2 Ideology Terms and Descriptions

Terms	Descriptions
Ideology	Ideologies are formed through social representations that define group social identity. They are formed slowly over time and are most noticeable through <i>Us</i> versus <i>Them</i> relationships.
Topic	Topics offer a global view of what is being conveyed in discourse and largely emerge from titles and summaries.
Repetition	Repetition emerges when information is repeated that emphasizes one party's positive attributes and an opposing party's negative attributes.
Comparison	Comparisons communicate the meaning of the text by juxtaposing situations or events.
Euphemism	Euphemisms are used to soften references to terms or statements that could be considered upsetting or inflammatory.

Table 2.3 Saliency/Erasure Terms and Descriptions

Terms	Descriptions
Saliency	Saliency refers to bringing an item into greater focus linguistically to convey an air of worthiness.
Erasure	Erasure refers to the distortion or omission of an item from discourse.
Activation	Activation occurs when an agent is portrayed as being the immediate cause of an action.
Hypernymy	Hypernyms are terms that lack specificity. They are general.
Hyponymy	Hyponyms are words acting as specific examples of more abstract terms.
Passivization	Passivization omits the actor, experiencer, or speaker from the text.

Appendix B

Table 3.1 Red Wolf Framing Themes

Theme	Definition	Example
Critically Endangered	This theme emerges from frames where red wolves are treated as the victims of human activity or where they are treated as the recipients of human aid to preserve the species from extinction and to expand its population.	“Red wolves are critically endangered. They were once at [sic] top [sic] predator found throughout the southeastern United States, including Tennessee, but was [sic] nearly driven to extinction in the 1900s.” This excerpt from Figure 3.3 features a simple narrative where humans nearly drive the wolves to extinction.
Native to the United States	This theme emerges from framing that identifies the red wolf as the only wolf species native solely to the United States.	“The Red Wolf is the only species of wolf native to the United States alone. As a result, they are often referred to as the American Red Wolf.” This excerpt from Figure 3.3 features red wolves occupying the semantic role of being the only species of wolf native to the United States alone.
Gentle Creatures	This theme emerges from framing that identifies red wolves as vulnerable and gentle creatures that are worthy of the restoration attempts surrounding them.	“In honor of Zoo Knoxville’s efforts to save Red Wolves from Extinction” This excerpt from Figure 3.1 features a simple narrative where Weiler Woods for Wildlife donates a plaque to honor Zoo Knoxville’s efforts to save Red Wolves from extinction.

Table 3.2 Western Lowland Gorilla Framing Themes

Theme	Definition	Example
Threat Surrounded	This theme emerges from frames where western lowland gorillas are shown to be victims of agriculture, disease, poaching, and other endangering circumstances connected to human activity.	“In 2007, IUCN’s [<i>sic</i>] status for western lowland gorillas was changed from endangered to critically endangered due to the devastation caused by the commercial bushmeat trade, the Ebola virus and the spread of logging.” This excerpt from Figure 3.20 features a simple narrative where the IUCN’s status for the gorillas changed to critically endangered because of the bushmeat trade, the Ebola virus, and logging’s devastating effect on gorillas.
Human Funded	This theme emerges from frames where western lowland gorillas are shown to need human assistance to supply their habitats and to help them thrive.	“Gorilla Overlook a gift from the Pilot Corporation” This excerpt from Figure 3.7 features a simple narrative where the Pilot corporation contributed to the gorilla habitat.
Related Creatures	This theme emerges from frames where the zoo’s western lowland gorillas are described as being similar to gorillas in the wild and to humans.	“Zoo Knoxville gorillas are like their relatives in the wild; they watch Gorilla Valley.” This excerpt from Figure 3.12 features a simple narrative where Zoo Knoxville gorillas remain like their wild relatives in that they watch their territory.

Table 3.3 German Cockroach Framing Themes

Theme	Definition	Example
Opportunity Seeking	This theme emerges from frames where German cockroaches are shown to enter structures on the zoo's grounds.	"Trees/vegetation touching [<i>sic</i>] house/building [<i>sic</i>]. Trim to prevent pest entry to [<i>sic</i>] structure." This excerpt from Figure 3.31 features a deep narrative where Zoo personnel must be vigilant in protecting structures from pest species.
Hazardous	This theme emerges from frames where German cockroaches are discussed as being hazardous.	"Details are recorded on service reports and provide information for pest trending." This excerpt from Figure 3.25 features a simple narrative where the zoo is monitored for the presence of pest species through the use of details recorded on service reports.

Table 3.4 Human Framing Themes

Theme	Definition	Example
Threats	This theme emerges from frames where humans are featured as harming nature.	“Because of the illegal hunting for bushmeat, hunters are paid high dollar for animal parts in African and Asian markets.” This excerpt from Figure 3.19 features a simple narrative of hunters being paid extremely well in African and Asian markets, at the expense of great apes, because of the illegal nature of bushmeat hunting.
Restorative Heroes	This theme emerges from frames where humans are featured as restoring nature.	“Casting by Dale Weiler” “Donated by Weiler Woods for Wildlife” “Dedicated October 14, 2019” “In honor of Zoo Knoxville’s Efforts to Save Red Wolves from Extinction” These excerpts from Figure 3.1 feature a simple narrative where Zoo Knoxville’s efforts to save red wolves from extinction are portrayed as being worthy of honor.
Explorers	This theme emerges from frames where humans are described as navigating unfamiliar terrain.	“Can you see the forest for the trees? Not when you are in the forest. The trees get in the way.” This excerpt from Figure 3.10 features a simple narrative of humans not being able to understand the communication systems of animals in the forest due to their hiddenness.

Table 3.4 Continued

Benefactors	This theme emerges from frames where humans are described as being a necessary aid to nature or as giving gifts to the zoo's nonhuman animals.	"This animal is part of a Species Survival Plan. Zoo Knoxville is dedicated to supporting this program through the Association of Zoos & Aquariums." This excerpt from Figure 3.2 features a simple narrative of humans not being able to understand the communication systems of animals in the forest due to their hiddenness.
Similar but Different Animals	This theme emerges from frames where humans are described as being similar to the zoo's nonhuman animals. Although the similarities are highlighted, key differences also appear.	"You probably turn your face to your friends when you communicate, but for a gorilla a direct stare is an aggressive gesture." This excerpt from Figure 3.12 features a simple narrative of a human reacting to eye contact with a gorilla by looking away.
Spectators	This theme emerges from frames where humans appear as eager audience members to nonhuman presence.	"If you want to see the gorillas during inclement weather, you may have to look in the courtyards or nurseries because the gorillas may choose to be indoors." This excerpt from Figure 3.23 features a simple narrative of humans searching for the zoo's gorillas in courtyards and nurseries.

Table 3.4 Continued

Guests	This theme emerges from frames where humans are treated as guests in the homes of nonhuman animals.	“Help Keep Our Home Peaceful” “Please do not tap on the glass. Thank you” This excerpt from Figure 3.22 features a simple narrative of the gorillas asking human guests to keep their home peaceful by refraining from tapping on the glass.
Inspectors	This theme emerges from frames where humans are treated as inspectors meant to curtail populations of unwanted nonhuman animals (pests).	“The facility is inspected to determine if insect activity or evidence is present and to identify areas that require corrective sanitation and structural maintenance measures.” This excerpt from Figure 3.25 features a simple narrative of the zoo’s specialist monitoring a facility to curtail the arrival of German cockroaches and other pest species.
Controllers	This theme emerges from frames where humans are treated as controllers meant to prevent populations of unwanted nonhuman animals (pests) from dwelling in the zoo’s facilities.	“Your Service Specialist evaluates sanitation and structural deficiencies conducive to a pest infestation.” This excerpt from Figure 3.25 features a simple narrative where a service specialist makes note of deficiencies that may attract pests to the facility.

Table 3.5 Red Wolf Ideology Themes

Theme	Definition	Example
Conservation	This theme emerges when the red wolf population is brought to attention in relation to being revived by humans and their institutions.	“This animal is part of a Species Survival Plan. Zoo Knoxville is dedicated to supporting this program through Association of Zoos and Aquariums.” This excerpt from Figure 3.2 illustrates “conservation” being used as a topic.
Identification	This theme emerges when red wolves are brought to attention in terms of their identifying markers.	“As their name suggests, Red Wolves are known for their reddish-brown color along their backs.” This excerpt from Figure 3.3 features the topic of what traits and markers distinguish red wolves.
Save Worthy	This theme emerges when red wolves are brought to attention as gentle animals, which may contribute to reasons why they should not be abandoned to extinction.	“In Honor of Zoo Knoxville’s Efforts to Save Red Wolves from Extinction” This excerpt from Figure 3.1 features the topic of red wolves as gentle creatures worth saving.

Table 3.6 Western Lowland Gorilla Ideology Themes

Theme	Definition	Example
Contributions	This theme emerges when humans making donations to the zoo on behalf of its gorillas are brought to attention.	“Gorilla Nursery a gift from Mr. & Mrs. Ross Faires” This excerpt from Figure 3.6 features the topic of Mr. and Mrs. Ross Faires sponsoring the gorillas’ nursery.
Behavior	This theme emerges when gorilla behavior is brought to the attention of guests.	“Zoo Knoxville gorillas are like their relatives in the wild; They watch Gorilla Valley.” This excerpt from Figure 3.12 features the comparison of the zoo’s gorillas with those in the wild. They are found to be similar.
Destruction	This theme emerges when attention is brought to the various dangers that surround gorillas and what humans can do to help resolve them.	“Recycling and using electronic devices decreases the demand for coltan. Commit to using your devices few [<i>sic</i>] years longer and recycle them when you upgrade. Through simple actions we [c]an help gorillas and their habitat.” This excerpt from Figure 3.18 features the topic of recycling devices to decrease the demand for coltan. This decrease conserves the habitat of critically endangered western lowland gorillas.

Table 3.6 Continued

Attentive	This theme emerges when humans are asked to be attentive to the behavior of the nonhuman animals that surround them, of which gorillas make up a significant number.	“If you live in the forest and want to communicate, you may need to use sounds and smells. Listen to how these animals communicate.” This excerpt from Figure 3.10 features the topic of humans becoming aware of how nonhuman animals who reside in forests communicate.
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Table 3.7 German Cockroach Ideology Themes

Theme	Definition	Example
Prevention	This theme emerges when attention is brought to the goal of Service Specialists and zoo personnel to prevent German cockroach habitat formation, attraction to water and debris, and evaluate conditions that can possibly result in infestations.	“Trees/vegetation touching [sic] house/building [sic]. Trim to prevent pest entry to [sic] structure.” This excerpt from Figure 3.31 features the topic of preventing cockroaches and other pest species from having/forming a habitat.
Recognition	This theme emerges whenever German cockroaches and other pest species are brought to attention as being objects of interest to service specialists and zoo personnel who are watchful of these animals’ behavior and who wish to eliminate them from the zoo grounds.	“The facility is inspected to determine if insect activity or evidence is present and to identify areas that require corrective sanitation and structural maintenance measures.” This excerpt from Figure 3.25 features the topic of determining if insects are active and how to manage sanitation and structural maintenance needs.
Treatment	This theme emerges from bringing attention to the different methods of eliminating German cockroaches and of removing their presence.	“Nyguard 1021-1603 0.011 Crack and Crevice” “Comments: Preventative treatment for cockroaches and other pests” These excerpts from Figure 3.33 feature the topic of applying preventative treatment to an area used by cockroaches and other pest species.

Table 3.7 Continued

Structural Deficiencies	This theme emerges when attention is brought to service specialists' concerns that German cockroaches and other pest species can enter a structure.	"Many [<i>sic</i>] access areas where pipes are going into floor and wall that needs [<i>sic</i>] to be sealed, cockroaches have easy access in those areas." This excerpt from Figure 3.29 features the topic of preventing cockroaches and other pest species from having/forming a habitat.
Ability: Zoo Personnel	This theme emerges when attention is brought to the zoo personnel's ability to prevent German cockroaches and other pest species from building habitats on zoo grounds.	"Pipes extending [<i>sic</i>] through wall allowing [<i>sic</i>] pest access. Please fill in gaps between pipes and wall [<i>sic</i>] to prevent pest entry." This excerpt from Figure 3.31 features the topic of preventing cockroaches and other pest species from entry and from having/forming a habitat.
Ability: Service Specialists	This theme emerges when attention is brought to service specialists' ability to prevent German cockroaches and other pest species from forming habitats on the zoo grounds.	"Treated areas where the pest were listed [<i>sic</i>] treated Budgie Building treated [<i>sic</i>] push buggies at main entrance. Treated smoke house and TN hot dogs." These excerpts from Figure 3.34 feature repetition concerning areas that the service specialist treated. This description of disruption in habitat formation is repeated.

Table 3.8 Human Ideology Themes

Theme	Definition	Example
Improvements	This theme emerges when attention is brought to the improvements that humans can make towards their treatment of the environment and in the amount of vulnerability that nonhuman animals encounter.	“In honor of Zoo Knoxville’s efforts to save Red Wolves from Extinction” This excerpt from Figure 3.1 features the topic of humans reducing the amount of vulnerability that nonhuman animals encounter.
Benefactors	This theme emerges when attention is brought to individuals and companies who have made donations to Zoo Knoxville.	“Thank You To the Alcoa Foundation For Their Generosity To The Knoxville Zoo’s Western Lowland Gorillas” This excerpt from Figure 3.15 features the topic of humans making donations to Zoo Knoxville.
Awareness	This theme emerges when attention is brought to humans developing awareness of nonhuman life.	“If you live in the forest and want to communicate, you may need to use sounds and smells. Listen to how these animals communicate.” This excerpt from Figure 3.10 features the topic of humans developing awareness of nonhuman communication.

Table 3.8 Continued

Elimination	This theme emerges when attention is brought to human-related threats faced by nonhuman animals.	“Chimpanzees and gorillas are hunted at a rate where populations cannot sustain themselves. Because of the illegal hunting of bushmeat, hunters are paid high dollar for animal parts in African and Asian markets.” This excerpt from Figure 3.19 features the topic of threats to nonhuman animals that are human-related.
Prevention	This theme emerges when attention is directed to the activity of preventing cockroaches from being able to make habitats on zoo grounds.	“Debris collecting under storage shelves. Please remove debris to prevent unsanitary conditions and attraction by pests.” This excerpt from Figure 3.31 features the topic of humans preventing German cockroaches from forming a habitat on zoo grounds.

Table 3.9 Red Wolf Salience/Erasure Themes

Theme	Definition	Example
Active	This theme emerges when attention is brought to whether or not red wolves are portrayed as being active agents in the text.	“The Red Wolf is the only species of wolf native to the United States alone.” This excerpt from Figure 3.3 features red wolves as active agents when discussing the red wolves’ status as the only species of wolf native to the United States alone.
Abstraction	This theme emerges when attention is brought to whether or not red wolves are treated abstractly in a text.	“This animal is part of a Species Survival Plan.” This excerpt from Figure 3.2 uses hypernymy when discussing the red wolves’ Species Survival Plan.
Specificity	This theme emerges when attention is brought to how specific descriptions are of the red wolves.	“In honor of Zoo Knoxville’s efforts to save Red Wolves from Extinction” This excerpt from Figure 3.1 uses hyponymy when discussing the delicate status of red wolves.

Table 3.10 Western Lowland Gorilla Salience/Erasure Themes

Theme	Definition	Example
Active	This theme emerges when attention is brought to whether or not gorillas are portrayed as being active agents in the text.	“They are more likely to watch you if you peek or glance at them.” This excerpt from Figure 3.12 features Western lowland gorillas as active agents when discussing their reactions to human eye contact.
Abstraction	This theme emerges when attention is brought to whether or not gorillas are treated abstractly in a text.	“Are all forests alike? You know they are different: different trees, different animals.” This excerpt from Figure 3.16 uses hypernymy when discussing the western lowland gorillas as “animals” that occupy forests.
Specificity	This theme emerges when attention is brought to whether or not gorillas are treated with specificity in a text.	“Troops are led by one dominant, older adult male, often called a silverback because of the swath of silver hair that adorns his otherwise dark fur.” This excerpt from Figure 3.13 uses hyponymy when discussing the statuses of gorillas within a troop: “alpha male,” “silverback,” and “young males.”

Table 3.11 German Cockroach Salience/Erasure Themes

Theme	Definition	Example
Active	This theme emerges when attention is brought to whether or not German cockroaches are portrayed as being active agents in the text.	“The facility is inspected to determine if insect activity or evidence is present” This excerpt from Figure 3.25 features the question of whether German cockroaches are present and, therefore, active.
Abstraction	This theme emerges when attention is brought to whether or not German cockroaches are treated abstractly in a text.	“Please remove excess water to prevent unsanitary conditions and attraction by pests.” This excerpt from Figure 3.31 uses hypernymy when discussing the cockroaches as pests that should be prevented against.
Specificity	This theme emerges when attention is brought to whether or not German cockroaches are treated with specificity in a text.	“Targeted Pests: Misc Insects, Occasional invader, Cockroaches, German Roaches, Ants, Misc ants” This excerpt from Figure 3.33 uses hyponymy when discussing the cockroaches as targets of Nyguard.

Table 3.12 Human Salience/Erasure Themes

Theme	Definition	Example
Active	This theme emerges when attention is brought to whether or not humans are portrayed as being active agents in the text.	“Because of the illegal hunting of bushmeat, hunters are paid high dollar for animal parts in African and Asian markets.” This excerpt from Figure 3.19 features hunters actively being paid for securing illegal bushmeat.
Abstraction	This theme emerges when attention is brought to whether or not humans are treated abstractly in a text.	“When you visit a zoo or aquarium with the AZA logo, you support an organization dedicated to the care of its animals.” This excerpt from Figure 3.4 uses hypernymy when discussing human guests as AZA organization supporters.
Specificity	This theme emerges when attention is brought to how specific descriptions are of the humans.	“Casting by Dale Weiler” This excerpt from Figure 3.1 uses hyponymy when discussing who created the casting that was donated to Zoo Knoxville to honor their efforts in saving red wolves.
Passive	This theme emerges when attention is brought to whether or not humans are portrayed as being passive recipients of action in the text.	“It is mined in the Democratic Republic of Congo, which is also the natural habitat of endangered gorillas.” This excerpt from Figure 3.18 omits the humans carrying out the action of mining.

Appendix C



Figure 3.1



Figure 3.2



Figure 3.4

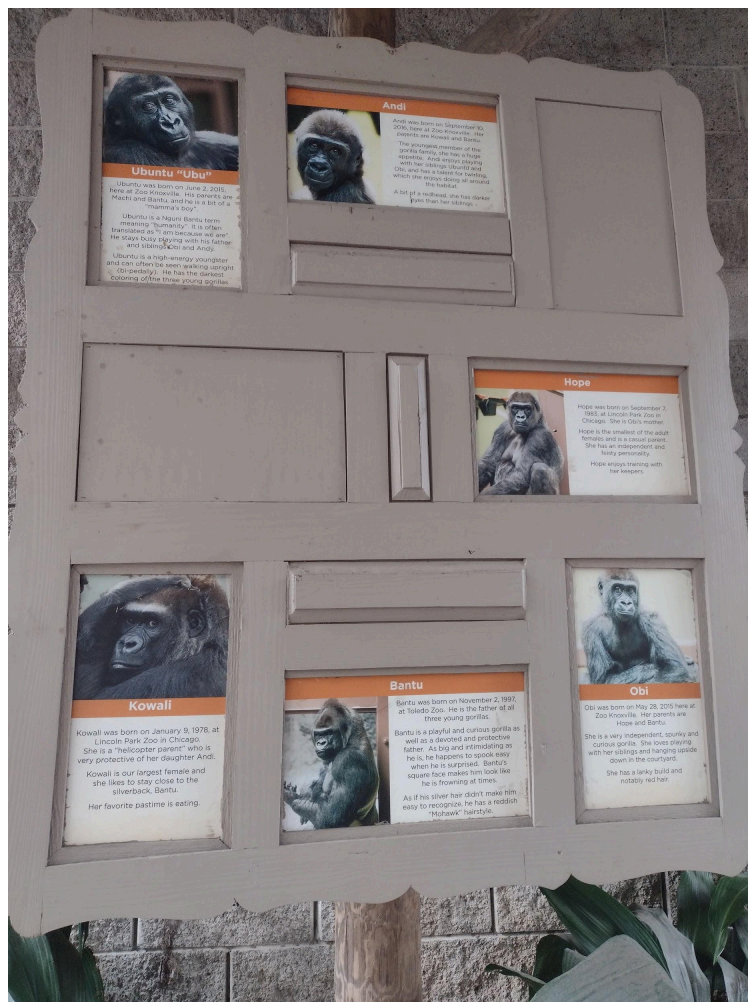


Figure 3.5



Figure 3.6



Figure 3.7



Figure 3.8



Figure 3.9



Figure 3.11



Figure 3.12



Figure 3.13



Figure 3.14



Figure 3.15



Figure 3.16



Figure 3.17

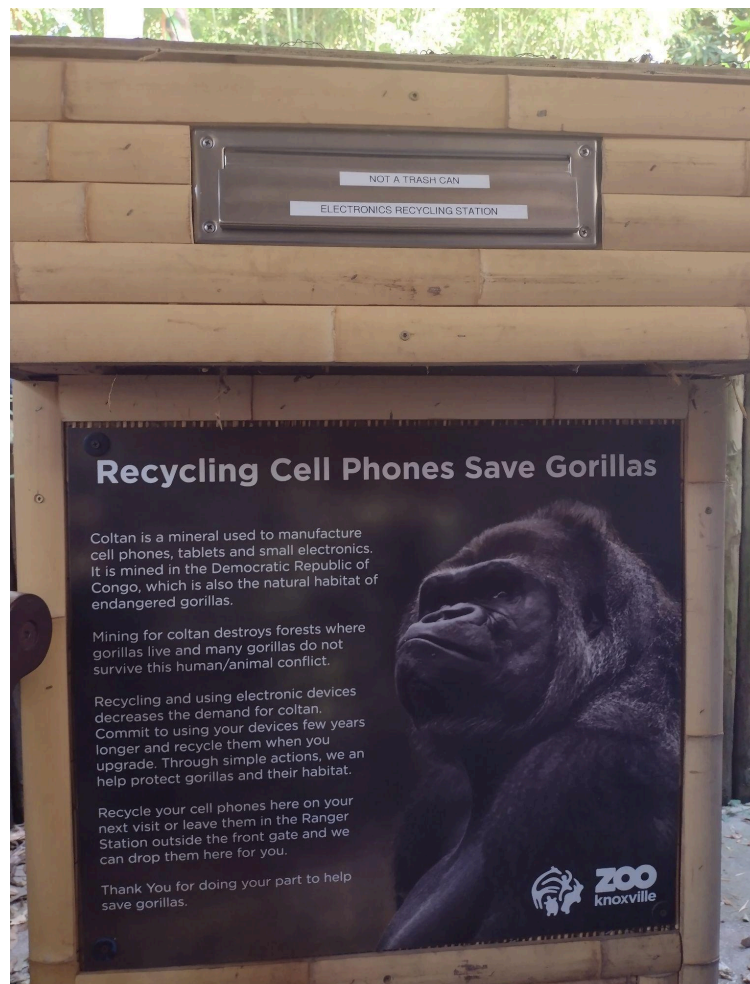


Figure 3.18



Figure 3.19



Figure 3.20



Figure 3.21



Figure 3.22



Figure 3.23



Your Service Specialist evaluates sanitation and structural deficiencies conducive to a pest infestation. Any area of concern is detailed on the service report filed in the Pest Management Program Service Manual.

OR (it cannot be both)

[Barcode Scanning Option] All hardware noted on the schematic is numbered and receives a unique barcode. Barcodes are scanned using handheld technology during each service rendered. Details are recorded on service reports and provide information for pest trending.

All applications and procedures are in accordance with industry best practices as well as requirements and guidelines of relevant third party auditors and inspectors.

IPM PROGRAM RESPONSIBILITIES

Ehrlich is responsible for the development and implementation of the IPM program; [REDACTED] is responsible for monitoring the execution of the IPM program.

SERVICE SPECIFICATIONS

Insect Management

Insect Management

Frequency: Weekly

The facility is inspected to determine if insect activity or evidence is present and to identify areas that require corrective sanitation and structural maintenance measures. Insect management procedures include the use of insect monitoring devices and the strategic placement of insect management bait, dust, liquid, and/or aerosol formulations by spot or crack and crevice application.

Exterior Perimeter Treatments

Frequency: Weekly

Exterior treatments are provided to the exterior foundation and immediate grounds of the buildings, using approved residual insect management materials. These treatments are designed to assist with the control of crawling occasional invaders on the exterior of the facility and mitigate entry into the structure.

Rodent Management

Interior Rodent Management

Frequency: Monthly

The facilities is inspected to determine if any rodent activity or evidence is present and to identify areas that require corrective sanitation and structural maintenance measures. Rodent management equipment is maintained on the interior of the facility around entry points, along exterior walls, and in other appropriate areas. All traps are inspected and cleaned upon each visit as necessary.

Exterior Rodent Management

Frequency: Monthly

Multi-catch traps and/or tamper resistant rodent bait stations are maintained in appropriate areas around the exterior of the facilities. Exterior rodent bait stations are secured to the ground, secured to the building, or weighted to keep them in place; stations are locked to ensure tamper

Figure 3.25



resistance. Rodent bait stations are inspected, cleaned, and maintained with fresh bait as necessary. Also, rodent burrows are baited as necessary. Rodent management device placement are in accordance with all internal, regulatory, outside, and client audit requirements and guidelines.

Flying Insect Management

Flying Insect Light Trap Service Program

Frequency: Monthly

Routine servicing and annual bulb changes are provided to ensure that insect light traps are functioning at maximum effectiveness. Units are inspected, cleaned to remove dead insects, dust and debris, and the type and quantity of insects present are recorded. Also, glue boards are replaced as necessary, if applicable. Bulbs are replaced at least annually prior to peak insect season, which is generally early spring. Additionally, the placement of units is reviewed and any relocation or additional placement recommendations will be offered.

Exterior Perimeter Treatments

Frequency: Weekly

Exterior treatments are applied to the exterior foundation, immediate grounds of the building, and accessible insect entry points using approved residual insect management materials. These treatments are designed to assist with the management of flying insects on the exterior of the facility.

Stinging Insect Management

Stinging Insect Management

Frequency: April-October

Management of bees, wasps, hornets, yellow jackets, etc. is performed upon request or as required. Approved stinging insect management materials, such as aerosols or dusts, traps are applied to the exterior grounds, generally during evening hours when the entire colony is in the nest and there is little presence of human or other non-target species in the immediate area. After the initial treatment, the nest is removed and the area is treated again with a residual insect management material to ensure that any workers not present at the time will be eliminated upon their return.

Nuisance Wildlife Management

Small vertebrate animals such as skunks, raccoons, squirrels, feral cats, opossums, ground hogs, etc. are live trapped as needed. Animals that are successfully captured are euthanized, relocated, turned over to animal control, and/or disposed of in accordance with local ordinances.

Ehrlich assists with identifying wildlife that are establishing habitat on the grounds or in the facility. If activity is identified, designated facility contact people will be notified of the activity and Ehrlich will assist in finding an appropriate contractor to assist in removal of wildlife within accordance of State and local regulations management equipment and materials are placed around entry points, openings, and other harborage areas to maintain control.

DOCUMENTATION AND COMMUNICATION

- Local contact information
- Certificate of insurance
- Pest sighting log
- Pest management device map

Figure 3.26



- Licenses and certifications
- IPM service program
- Labels and Safety Data Sheets
- Quality assurance reviews
- Material usage reports
- Service reports
- Annual Facility Assessments
- Trend reports/ PNOL

Ehrlich places a strong emphasis on maintaining communication with designated personnel to assure proper implementation and success of the pest management program.

QUALITY ASSURANCE

Regularly scheduled contact is maintained between your Ehrlich management team and your key personnel to ensure that the described service program is meeting and exceeding expectations. This entails 1 thorough inspection of the Knoxville Zoo facility per year. This service is designed to ensure that our quality standards are being maintained and are consistent throughout the company. The results of these quality assurance visits are made available for review by Ehrlich leadership and Quality Managers.

INSURANCE

Ehrlich maintains adequate insurance coverage; including general liability, worker's compensation, and automobile liability. A copy of the current Certificate of Insurance is available in the 'Insurance, License, & Certification' tab of the Program Manual.

TIME OF SERVICE

Services are rendered at an agreed upon time. Your Service Specialist will contact your personnel prior to initiating any work and will check out prior to leaving your premises. A service report is left with your personnel upon completion of each service.

CALLS FOR ADDITIONAL SERVICE

In the event additional services are necessary between our regularly scheduled visits, such services will be rendered promptly within 24 hours. For Non-covered pest there will be a charge of \$150 per hour. It is our procedure to call clients requesting additional service within four hours of the original additional service request.

MATERIALS AND EQUIPMENT

All labor, materials and equipment required to render the services described herein are be furnished by and remain the property of Ehrlich with the exception of any damaged or missing equipment is replaced and charged to Knoxville Zoo. Materials used and application methods are in accordance with regularly established practices and in compliance with Federal, State and local regulatory agencies. Pesticides used are approved by a designated facility representative before application. In the event of any changes to materials or services the facility will be notified by Ehrlich of intended changes.

TRAINING AND ORIENTATION

Ehrlich, in conjunction with Knoxville Zoo, provides the following training assistance:

- On-site training with each service, effectively communicating structural and sanitation concerns related to maintaining an effective pest management program at your facility.

Figure 3.27



- Attendance at Knoxville Zoo meetings to create an exchange forum on pest management and sanitation concerns directly related to the success of an effective pest management program.
- Ehrlich also offers comprehensive and customizable client learning programs and has a large library of videos and information on pest management and safety practices.

GMP AND IPM TRAINING

Ehrlich associates attend documented GMP and IPM training. Certificates of completion are kept in the 'Insurance, License, & Certification' tab of the Program Manual. Ehrlich associates also maintain evidence of competency through organizations and training programs which may include state pest management associations, Purdue University, AIB, the National Pest Management Association, Rentokil specialist training program, Rentokil University, and monthly training meetings.

SANITATION AND STRUCTURAL DEFICIENCIES

Proper storage, sanitation, and pest proofing of facilities are factors which affect the quality of your pest management program. Your Service Specialist documents situations relevant to the overall success of your pest management program and needing your timely attention. Correcting these deficiencies will enhance the level of control at your facility and help maintain a pest-free environment.

APPLICATOR LICENSING

In accordance with the amended Federal Insecticide Fungicide and Rodenticide Act (FIFRA) and in compliance with State Law where required, pest management materials are applied by a Certified Applicator or an individual working under the direct supervision of a Certified Applicator. It is our policy that all of our service and supervisory personnel be certified in all states where pest management materials are applied.

CHEMICAL OR SERVICE EMERGENCIES

In the event of a service request/emergency, please call CSC (1-888-761-3030)

In the event of a pesticide-related spill emergency, please call CHEMTREC at 800-424-9300 (24 hrs).

In the event of emergencies concerning exposure to, or ingestion of, pesticides call the U.S. Poison Control Center at 800-222-1222 (24 hrs).

Figure 3.28



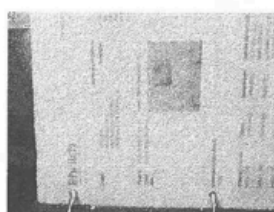
Summary of Service

Client:

Location:

Time In: 05-13-2022 07:00:07
 Time Out: 05-13-2022 10:40:07

Issue : Photo Captured



05-13-2022 10:40:59

License/Certifications:

16092

Order # / Invoice	Status	Service Date	Service Description	Visit Type
5417 / 803	Completed	05-13-2022	PEST SERVICE CORRECTIVE	SERVICE MAINTENANCE
6682 / 144	Completed	05-13-2022	PEST CONTROL MAINTENANCE	SERVICE MAINTENANCE
6682 / 149	Completed	05-13-2022	PEST CONTROL MAINTENANCE ADDED 3RD SVC	SERVICE MAINTENANCE

Recommendations

Area/Device	Recommendation	Severity	Status	Date
Int Budgie Building	many access areas where pipes are going into floor and wall that needs to be sealed, cockroaches have easy access in those areas.	Medium	New	05-13-2022
RBS 016	alot of debris in back of restaurant. many places where rodents and other furry pests can hide and live. please clean	Medium	New	05-13-2022
RBS 019	another of leaves and debris in back of restaurant where rodents can live and hide. please clean especially between buildings next to bait station.	High	New	05-13-2022
TN hotdogs- paper towel die	something sticky on floor where the syrup boxes for drink dispenser. please clean. this will be a big attractant to ants and	Medium	New	05-13-2022

Figure 3.29

TN hotdogs-paper towel dis	back Door gap/damage noted that allows pest access. Please repair to prevent pest entry.	Medium	New	05-13-2022
RBS 003	Weeds/grass in area need to be maintained at 6 inches or less.	Low	NEW	05-06-2022
Dishwash Area Paper Towel	Pipes extending through wall under sink in dish wash allowing pest access. Please fill in gaps between pipes and wall to prevent pest entry.	Low	NEW	05-06-2022
Front Counter Paper Towel	Pipes extending through wall allowing pest access. Please fill in gaps between pipes and wall to prevent pest entry.	Medium	NEW	05-06-2022
TN hotdogs-paper towel dis	Trees/vegetation touching house/building. Trim to prevent pest entry to structure.	Low	COMPLETE	04-29-2022
TN hotdogs-paper towel dis	sticky stuff all over counters. this will attract ants old food also laying out uncovered.	Low	COMPLETE	04-29-2022
TN hotdogs-paper towel dis	Debris or other material in drain causing blockage. Please remove debris to unblock drain and prevent attraction by pests.	Low	COMPLETE	04-29-2022
RBS 020	Pipes extending through wall allowing pest access. Please fill in gaps between pipes and wall to prevent pest entry.	Medium	NEW	04-08-2022
Int Pranzo-paper towel dispenser.	Pipes extending through wall allowing pest access. Please fill in gaps between pipes and wall to prevent pest entry.	Low	NEW	04-08-2022
RBS 033	Weeds/grass in area need to be maintained at 6 inches or less.	Low	NEW	03-25-2022
RBS 034	Weeds/grass in area need to be maintained at 6 inches or less.	Low	NEW	03-25-2022
RESTROOMS	Door gap/damage noted that allows pest access. Please repair to prevent pest entry.	Low	NEW	03-24-2022
Ext Herpetology	Door gap/damage noted that allows pest access. Please repair to prevent pest entry.	Low	NEW	03-24-2022
RBS 015	Trees/vegetation touching house/building. Trim to prevent pest entry to structure.	Low	NEW	03-18-2022
RBS 015	leaves and old furniture stacked up, looks nasty. needs to be cleaned up	Low	NEW	03-18-2022
Int The Roaming Rhino	Door gap/damage noted that allows pest access. Please repair to prevent pest entry.	Low	NEW	03-18-2022
Int Lion/Baboon Bldg- door frame.	Pipes extending through wall allowing pest access. Please fill in gaps between pipes and wall to prevent pest entry.	Low	NEW	03-11-2022

Figure 3.30

Hay Barn	Pipes extending through wall allowing pest access. Please fill in gaps between pipes and wall to prevent pest entry.	Medium	NEW	12-27-2019
Tool Room	Debris collecting under storage shelves. Please remove debris to prevent unsanitary conditions and attraction by pests.	Medium	NEW	11-22-2019
Ext Great Apes	Water leak/standing water on roof. Please remove excess water to prevent unsanitary conditions and attraction by pests.	High	NEW	11-15-2019
Ext Great Apes	Pipes extending through wall allowing pest access. Please fill in gaps between pipes and wall to prevent pest entry.	High	NEW	11-15-2019
Ext Great Apes	Please trim all vegetation 18' away from the building to help eliminate rodent entry.	High	NEW	11-15-2019
Ext Upper Admin	Trees/vegetation touching building. Trim to prevent pest entry to structure.	High	PENDING	08-16-2019
Ext Night Club	Please trim all vegetation away from guest seating benches.	High	NEW	08-02-2019
Int The Bird Show	Debris collecting interior. Please remove debris to prevent unsanitary conditions and attraction by pests.	High	NEW	06-14-2019

Pest Summary			
Location	Activity	Quantity	Comments
RBS 001 CONTRA	Rodent Feeding	75%-100%	replaced with new contra bait
RBS 003 CONTRA	Rodent Feeding	75%-100%	replaced with new contra bait
RBS 004 CONTRA	Rodent Feeding	75%-100%	placed new contra bait out
RBS 002 CONTRA	Rodent Feeding	75%-100%	replaced with new contra bait

Device Summary				
Type	With Activity	Without Activity	Unserviceable	Total Inspected
Rodent Bait Station	4	2	0	6
Inspection Point	0	7	0	7
Insect Light Trap	0	2	0	2

Material Application Summary					
Material Applied	EPA#	Dilution (%)	Concentrate Applied	Quantity UOM	Application Method
ILT Glueboard	na	0	0	1 each	Containerized Station

Targeted Pests:	Flies, House flies
Area/Device of Application:	ILT 004
Equipment Used:	Hand
Comments:	Replacement glueboards for flylights

Figure 3.31

Weather:		Sky Condition: Clear, Temperature: 62, Humidity (%): 75, Wind Direction: Southeast, Wind Speed: 2					
ILT Glueboard	na	0	0	1	each	Containerized Station	
Targeted Pests:		Flies, House flies					
Area/Device of Application:		ILT 003					
Equipment Used:		Hand					
Comments:		Replacement glueboards for flylights					
Weather:		Sky Condition: Clear, Temperature: 62, Humidity (%): 75, Wind Direction: Southeast, Wind Speed: 2					
First Strike Soft Bait (10grms/pouch)	7173-258	0.0025	0	1	each	Containerized Station	
Targeted Pests:		Rodents, House mice					
Area/Device of Application:		RBS 019					
Equipment Used:		Hand					
Active Ingredient(s):		Difethialone					
Comments:		Bait placement for rodents					
Weather:		Sky Condition: Clear, Temperature: 62, Humidity (%): 75, Wind Direction: Southeast, Wind Speed: 2					
First Strike Soft Bait (10grms/pouch)	7173-258	0.0025	2	2	each	Containerized Station	
Targeted Pests:		Rodents, House mice					
Area/Device of Application:		RBS 016					
Equipment Used:		Hand					
Active Ingredient(s):		Difethialone					
Comments:		Bait placement for rodents					
Weather:		Sky Condition: Clear, Temperature: 62, Humidity (%): 75, Wind Direction: Southeast, Wind Speed: 2					
Maxforce FC Magnum 432-1460 Roach Gel		0.05	15	15	gram	Spct	
Targeted Pests:		Cockroaches, American Roaches					
Area/Device of Application:		Elephant Barn- rear door frame.					
Equipment Used:		Bait Applicator					
Active Ingredient(s):		Fipronil					
Comments:		Treated for American cockroaches					
Weather:		Sky Condition: Clear, Temperature: 68, Humidity (%): 79, Wind Direction: , Wind Speed:					
PT Alpine Pressurized Fly Bait	499-568	1	1.5	1.5	oz	Spct	
Targeted Pests:		Flies, House flies					
Area/Device of Application:		Great Ape Bldg					

Figure 3.32

Equipment Used:		Aerosol				
Active Ingredient(s):		Dinotefuran				
Comments:		Treated walls and put out place cards and put bait on them for house flies and other flying pest				
Weather:		Sky Condition: Cloudy, Temperature: 70, Humidity (%) : 80, Wind Direction: Southwest, Wind Speed: 2				
Maxforce FC Magnum 432-1460 Roach Gel		0.05	20	20	grm	Spot
Targeted Pests:		Cockroaches, American Roaches				
Area/Device of Application:		Great Ape Bldg				
Equipment Used:		Bait Applicator				
Active Ingredient(s):		Fipronil				
Comments:		Treated in ape barn for American cockroaches in several areas.				
Weather:		Sky Condition: Clear, Temperature: 68, Humidity (%) : 79, Wind Direction: , Wind Speed:				
Maxforce FC Magnum 432-1460 Roach Gel		0.05	15	15	grm	Spot
Targeted Pests:		Cockroaches, American Roaches				
Area/Device of Application:		Int Budgie Building				
Equipment Used:		Bait Applicator				
Active Ingredient(s):		Fipronil				
Comments:		Treated for American cockroaches				
Weather:		Sky Condition: Clear, Temperature: 68, Humidity (%) : 79, Wind Direction: , Wind Speed:				
Nyguard	1021-1603	0.011	0.005249999999999995	5	ml	Crack and Crevice
Targeted Pests:		Misc Insect, Occasional invader, Cockroaches, German Roaches, Ants, Miscellaneous ants				
Area/Device of Application:		TN hotdogs- paper towel dis				
Equipment Used:		Compressed Sprayer				
Active Ingredient(s):		2-(1-Methyl-2-(4-phenoxyphenoxy)ethoxy) Pyridine				
Comments:		Preventative treatment for cockroaches and other pests				
Weather:		Sky Condition: Clear, Temperature: 62, Humidity (%) : 75, Wind Direction: Southwest, Wind Speed: 2				
Alpine WSG	499-561	0.1	0.0132	5	oz	Crack and Crevice
Targeted Pests:		Misc Insect, Occasional invader, Cockroaches, German Roaches				
Area/Device of Application:		TN hotdogs- paper towel dis				
Equipment Used:		Compressed Sprayer				
Active Ingredient(s):		Pyrethrins				
Comments:		Preventative treatment for cockroaches and other pests				
Weather:		Sky Condition: Clear, Temperature: 62, Humidity (%) : 75, Wind Direction: Southwest, Wind Speed: 2				

Figure 3.33

Alpine WSG 499-561 0.1 0.02112 8 oz Crack and
Crevice

Targeted Pests: Misc Insect, Occasional invader, Cockroaches, German Roaches
Area/Device of Application: Safari smokehouse
Equipment Used: Compressed Sprayer
Active Ingredient(s): Pyrethrins
Comments: Preventative treatment for cockroaches and other pests
Weather: Sky Condition: Clear, Temperature: 62, Humidity (%): 75, Wind Direction: Southwest, Wind Speed: 2

Nyguard 1021-1603 0.011 0.0084 8 ml Crack and
Crevice

Targeted Pests: Misc Insect, Occasional invader, Cockroaches, German Roaches, Ants, Miscellaneous ants
Area/Device of Application: Safari smokehouse
Equipment Used: Compressed Sprayer
Active Ingredient(s): 2-(1-Methyl-2-(4-phenoxyphenoxy)ethoxy) Pyridine
Comments: Preventative treatment for cockroaches and other pests
Weather: Sky Condition: Clear, Temperature: 62, Humidity (%): 75, Wind Direction: Southwest, Wind Speed: 2

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Totals

Material Applied	EPA#	Quantity	UOM
ILT Glueboard	na	2	each
First Strike Soft Bait (10grms/pouch)	7173-258	3	each
Maxforce FC Magnum Roach Gel	432-1460	50	grm
PT Alpine Pressurized Fly Bait	499-568	1.5	oz
Nyguard	1021-1603	13	ml
Alpine WSG	499-561	13	oz

General Comments:

Checked logbook for pest sightings. Treated areas where the pest were listed treated Budgie building and treated push buggies at main entrance. Treated smoke house and TN hot dogs. Treated ape barn and elephant barn as well. Replaced and put new bait in rodent bait stations. Recommendations noted due to potential pest issues. Will be back hopefully Tuesday to start my twice a week treatment. Please call if you need anything.

Figure 3.34

Vita

Dynestee Fields grew up in Anderson, South Carolina. After graduating from high school, she attended Southern Wesleyan University where she earned a Bachelor of Arts degree in English with a minor in Media Communication. While an undergraduate, she knew that she wanted to attend graduate school. She chose to pursue a Master of Arts degree in English with a concentration in Rhetoric, Writing, and Linguistics at the University of Tennessee, Knoxville. Her research interests include critical animal studies, human-animal studies, rhetorical studies, and technical communication. She is incredibly grateful for the support that she has received from her advisor, committee, colleagues, family, friends, and all others who have been indispensable to her educational and professional experiences.