

THE DESERT'S CANARY:
A NARRATIVE EXAMINATION OF THE SOCIO-POLITICAL ROLE OF THE
THREATENED DESERT TORTOISE

By

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ABSTRACT

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Through story, personal experience is connected to broader meaning. The stories that individuals tell about a flagship species contribute not only to the animal's role in conservation, but also to collective human imagination and culture. The purpose of this research is to reveal the roles (social, cultural, political, and ecological) that the desert tortoise plays in the California Desert, and to uncover how these roles are demonstrated through conservationist's narratives. This study utilizes mixed qualitative methods with the goal of discovering why the Mojave Desert Tortoise (*Gopherus agassizii*), an iconic and threatened species, has particular significance within the desert conservation community. Results suggest that the desert tortoise plays several salient roles in the socio-ecological landscape of the California Desert that fundamentally reflect the place-based values of residents. Six specific themes were found that reify the tortoise's place as a surrogate species and spotlight the place of the species in the human imagination. A discussion of the results illuminates how the conservation-reliant status of the tortoise, coupled with protection of biodiversity that is accomplished by deploying the species in development debates, highlights the need for more research on the social, political, and

cultural significance of the tortoise. Further research exploring how narrative demonstrates socio-cultural dimensions of flagship conservation could be beneficial to understanding human perceptions of iconic wildlife and anthropogenic impacts on a broad scale.

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I also want to acknowledge the people and animals that fostered my passion for the desert. Frisky and Olive, the captive desert tortoises I grew up with and loved—they weren't able to live out their lives in the desert wilderness where they belong, but because of them I'll fight so that others can. My grandparents who lived in the Coachella Valley provided me with a well of amazing desert memories to draw from, particularly my grandma Arlene Kohn, who would be kvelling right now.

This thesis is dedicated to my mom, Gina, who has undergone cancer treatment as I pursued my Master's degree. Like the tortoise, you are perseverant and grow stronger with time. This piece of writing is a testament to your enduring strength and love.

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PROLOGUE

I recall that day frequently.

My friend and I were visiting her family's desert cabin in Wonder Valley, an unincorporated area east of Twentynine Palms, California. I don't remember exactly what we were doing that day. Sometimes when we were out there for a weekend, or for spring break, we would sit in the wash by their cabin and pretend that the sand was ice cream and we'd scoop it into beach toys and buckets. We were preteens, on the cusp of being too old to play those imaginative games. When my friend would get up to grab another container, or to use the restroom, I would sink into the sandy wash a bit deeper and watch the wild grasses twitch in the silent breeze. It's so quiet, I'd think to myself.

Her dad came up to us one afternoon, obviously alert and excited. "I just saw a desert tortoise," he said. "Come with me and I'll take you guys to it."

The year was probably 2006. I would have been 12. I think it was springtime.

We put on our tennis shoes as fast as we could, and hurried over to find the tortoise. Sure enough, there he was, resting quietly in the shade of a creosote bush. I knelt down to get a closer look at him. With my arms wrapped around my bony knees, I watched him for nearly an hour.

Stories are bound by context. In the case of stories we communicate about wildlife, narratives are likely framed by the place, its associations, and any preexisting value assumptions we might have about the location and the animal. Like the encounters I had with a couple of desert tortoises out by my parent's homestead, the experiences we

have with wildlife can, in different ways, motivate us to engage with conservation ideologies. The tortoise holds special significance to residents of the U.S. Southwest given the status of the tortoise as “threatened” under state and federal Endangered Species Acts (ESAs), its position as both California and Nevada’s state reptile, and its role in passing the 1994 Desert Protection Act. Desert tortoise populations have been declining quickly since the 1950s, in large part due to developments such as military base expansion, utility-scale solar projects, use of large swaths of critical habitat for grazing, off-highway vehicle (OHV) recreation, increased predation, disease, and more. The purpose of the present study is to uncover how desert residents working in conservation relate to and feel about the flagship desert tortoise. In searching for these connections, I found that the tortoise meets several criteria in being an effective surrogate species, or a species that is utilized to represent an ecosystem and pursue conservation initiatives, and fulfills a number of different roles both on the landscape and in the human imagination to inspire desert conservation.

In chapter one, I review the literature surrounding the desert, its tortoise, and the anthropocene. Chapter two covers the methodology and methods that I used to conduct my research. The methodology is reflective of theoretical frameworks utilized in data analysis, including narrative inquiry and grounded theory. Methods used to conduct this research are qualitative, with a primary focus on semi-structured interviews. Results are shared throughout chapters three, four, and five, and are structured around emergent themes. Each chapter includes two themes and a brief synthesis of their overlapping qualities. Following the results chapters is a discussion where I analyze and reflect on my

results, their implications, and possibilities for future research. Finally, I conclude with an epilogue where I revisit my own experiences with wild desert tortoises.

CHAPTER 1: LITERATURE REVIEW

There are several bodies of literature that facilitate understanding the relationship between the desert tortoise and the desert conservation community (Figure 1). First, I review literature conceptualizing the desert as a place, as well as a brief discussion of place-based identity literature. Next, I detail what the desert tortoise is, the meaning of its flagship status, and the longitudinal role it has played in desert conservation. Lastly, I discuss the era of the anthropocene, and explore the implications of more far-reaching anthropogenic impacts to the desert, its tortoise, and the world. My research brings together these conversations that have not yet found their intersections, and could be imagined as connective tissue between several bodies of literature.

While the desert tortoise's longitudinal cultural significance has been studied, it has not been looked at from an academic standpoint of being a socially important component of desert conservation. Literature about the tortoise's cultural and political significance has not discussed the tortoise's role as reinforcing place-based desert values. This research examines how people working within land management and conservation in the California Desert perceive the tortoise's role in the landscape and culture, and how that role reinforces the values of desert residents. Essays about the current mass extinction event are also briefly examined in my literature review, since interviews with participants broached the sensitive topics surrounding the anthropocene and the decline of the beloved species.

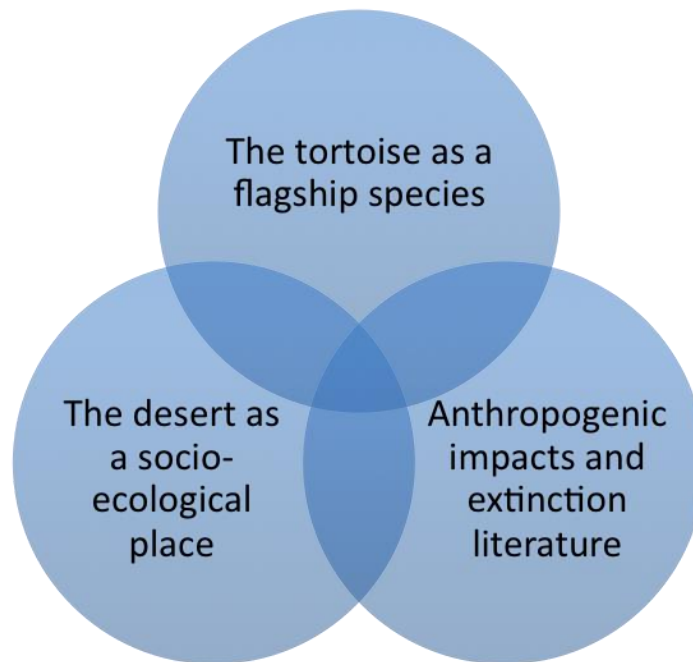


Figure 1. The intersection in the literature where my research enters

The idea of conducting such interdisciplinary research disputes the common notion that problem solving is the terrain of only scientists, engineers, and mathematicians. Toadvine (2011) explains that several myths are often perpetuated about interdisciplinarity, including one that posits that those who study the humanities can only contribute marginally to problem solving, such as by doing public outreach. In reality, Toadvine (2011) claims, interdisciplinarity is a “process composed of entirely of moving parts, and there is no imaginable end-state for it to achieve” (p. 6). While previous research on the desert tortoise has illuminated different aspects of the animal’s ecology and biology, my research contributes to the process of understanding the desert tortoise’s social, political, and cultural roles, and how those roles serve to make it’s ecology and biology more compelling. In this background section, I will review the literature to

examine how the desert is discursively understood (or, comparatively, misunderstood) as an ecological, social, political, and cultural place while highlighting the landscape's recent history of radical change.

The Desert

“For all the toll the desert takes of a man it gives compensations, deep breaths, deep sleep, and the communion of the stars.”

–Mary Austin, The Land of Little Rain

The desert blooms with diversity that is not often visible to the traveling or the impatient eye. Is that the distant hum of off road vehicles in the wash below, or the gentle flicking of a hummingbird's wings in the blooming ocotillo overhead? Although 17% of the world's land mass is desert, and 45% of the world's habitat is considered at least semi-arid, deserts continue to be a place of contested uses, identities, and conceptualizations that remain largely misunderstood (Belbachir, Pettorelli, Wachter, Belbachir-Bazi, & Durant, 2015; Ahi, 2016). The Merriam-Webster Dictionary defines “desert” as arid, devoid of life, sparsely vegetated, archaic, and desolate. This definition is echoed by the fact that environmental concern about deserts has been lacking in comparison to that displayed over oceans and forests, although exposure to a warming climate poses a particularly harmful threat to desert ecosystems (Ahi, 2016). Visual and written representations of desert ecosystems perpetuate its ongoing construction as a wasteland.

Despite common misrepresentations, the desert harbors 38% of the native plant species in California, while taking up 28% of the states land area (Andre, 2014). Along with having 2,450 native vascular plant species, the desert is also where one can find the “oldest vascular plants in California, such as the creosote bush and bristlecone pine, more ancient than the giant sequoia and coastal redwood trees” (Andre, 2014, p. 3). Furthermore, a quarter of the rare species in the California deserts are endemic to the state (Moore & Andre, 2014, p. 10). Unique desert habitats home to these species include “more than 100 major mountain ranges, myriad canyons, playas, alkali meadows, badlands and sprawling sand dune complexes” (Andre, 2014, p. 3). There are dozens of fish, amphibians, reptiles, and mammals, and over 420 species of birds, with new species of flora and fauna being discovered frequently (Pavlik, 2008). Most life in the desert has evolved to withstand severe drought and heat, such as the honey mesquite with roots that have been found at depths of 200 feet underground (Pavlik, 2008). These adaptations embody lessons that are particularly important to learn about as the global climate warms dramatically and arid climates become even drier. In understanding how plants and animals adapted to aridity survive the harsh environment, perhaps we can better prepare ourselves—and our societies—for a changing climate. One barrier to conducting research in the desert is precisely this harsh environment, and although many researchers have dedicated themselves to studying desert life, assumptions remain among the general population that the desert is an uninhabitable and scary place.

The Desert Southwest is either portrayed as an empty, dangerous, exploitable landscape, or a romantically picturesque, untouched ecosystem rich with biodiversity,

laden with environmental protections at the state and federal level. As evidenced by its dictionary definition and synonyms, the desert is a place that common discourse often dismisses as “lifeless,” “barren,” and as a “wasteland.” Several authors, researchers, artists, and educators have sought to unravel or analyze these dominant desert stereotypes. Beck (2001) establishes five rhetorical tropes associated with the desert, explaining the ways in which it is regarded in Judeo-Christian society due to its representation in the Bible. These tropes include empty, apocalyptic, vast, chaotic, and lacking boundary (Beck, 2001). *The Mojave Project*, launched by Kim Stringfellow (2015), explores conceptual themes similar to those outlined by Beck. The transmedia project examines “the physical, geological, and cultural landscape of the Mojave Desert,” focusing on eight conceptual themes, including the desert as wasteland, as temporal, as sacrifice and exploitation, as staging ground, as space, as danger, as movement, and as transformation (Stringfellow, 2015).

The arid lands encompassing the Southwest are commonly portrayed in political discourse as an untapped energy resource, a boundless sea of emptiness, and as an experimental war front. According to Jim Andre, Director of the Granite Mountains Desert Research Center, Arnold Schwarzenegger, Governor of California from 2003-2011, once said of the desert, “c’mon, it’s just a desert.” Similarly, Harry Reid, a former U.S. Senator, said, “there’s a lot of vacant space out there.” Andre attributes these attitudes to a prejudice against arid environments, which he calls “aridism” (Andre, 2018). Andre defines aridism as “prejudice, discrimination, or antagonism directed against native ecosystems that have evolved and adapted to aridity, based upon the belief

that they are lifeless and therefore in desperate need of exploitation or transformation” (2018).

The desert has unique assumptions of value attached to it that are used to justify its exploitation and degradation. For example, because of its perceived emptiness and isolation, the greater Mojave Desert, which is home to the Twentynine Palms Marine Corps Base, the Army’s Fort Irwin, and China Lake Naval Weapons Center, is considered “the perfect space for tank and aircraft practice without interference of risk to civilians” (Hamin, 2003, p. 139). The largest military bases/military training areas in the continental U.S. exist in arid spaces of the Southwest (National Park Service). Hunold and Leitner (2011) explain that in the past 50 years southwest deserts have been used as spaces for “military bases, weapons testing grounds, clandestine science laboratories, and nuclear dumping grounds” (p. 693). Hunold and Leitner’s discourse analysis led them to hypothesize that there is a “symbolic and literal ‘hierarchy of ecosystems’ that places the desert last on a ranking by human value and a pre-existing discursive constructing of the desert” (2011, p. 691). The low value placed on the desert in western society has primed the landscape for political and economic exploitation, and energy development has been a threat to the U.S. Southwest lands for decades now.

The current focus on energy development is focused on “green” energy trends. A renewable energy “boom” occurring in the Mojave—involving utility-scale solar development and wind farms—is largely seen as a beneficial step in improving the health of the planet (Hunold & Leitner, 2011). Climate change is a global phenomenon that will eventually impact every being on Earth (that is, if it hasn’t already). One way that

humans are seeking to lower carbon emissions and change the global warming trend is by switching from nonrenewable to renewable energy resources. Different versions of energy development (one being mining, for example) have exploited the Southwest for decades, and today, industrial scale solar and wind farms are a common sight in the California Desert.

Although solar is often thought of as having sparse impact on the environment, the catch is that it requires a lot of land—often thousands of acres. Biologists studying desert ecosystems argue that there are viable alternatives to industrializing the biodiversity-rich, intact lands of the desert southwest. Many argue that these developments have a significant impact on the desert ecosystem, since it is nearly impossible to restore disturbed desert soils to their original, healthy state (Belnap, 2003). Some of these impacts are broadly the result of perceptions of the desert landscape as “open,” “vacant,” or “barren,” and can be attributed to the value assumptions that surround arid environments that were discussed earlier.

Another issue facing the human and non-human communities in the desert is the use of off-highway vehicles (OHVs) on private and public land. According to a publication released by the United States Geological Survey (USGS), soil compaction caused by OHV use negatively affects native plant growth, contributes to habitat fragmentation, and encourages pollutants (Ouren et al., 2007). The desert tortoise, listed as a potential victim of proposed and existing OHV routes, has proven instrumental in facilitating the human resistance against damaging off-road vehicle use in the Mojave.

Recreational activities like OHV use are important to evaluate in desert environments, since generally, the California Desert is not an ecologically resilient landscape. According to Lovich and Bainbridge (1999), “extreme temperatures, intense sun, high winds, limited moisture, and the low fertility of desert soils make natural recovery of the desert very slow after disturbance” (p. 309). Belnap (2003) notes that the slow growing and fragile biological soil crusts provide stability and fertility to desert ecosystems. Increasing disturbances, e.g. by OHVs, threaten the integrity of delicate desert soil crusts. According to Belnap (2003), “human activities are often incompatible with the presence of soil crusts” (p. 188).

According to Hull, Robertson, & Kendra (2001), people living “near or in ‘natural’ areas tend to view evidence of human culture as appropriate, acceptable, and compatible features of the natural landscape,” while tourists and visiting recreationists from other places “tend to see the same place as a wild, green, natural spot on the map, a place where human presence degrades the valued natural qualities” (p. 327). Of course, people living in the rural arid Southwest probably see the environment as shaping their own lived experiences and therefore would have difficulty separating their humanness from their landscape; as Hull et al. (2001) note, “landscapes are symbolic environments used by people to define themselves” (p. 327). This sentiment is echoed by Cresswell (2014), who posits that place is “a way of seeing, knowing, and understanding the world” (p. 18). Cheng, Kruger, & Daniels (2003) also echo this idea, and argue that “to be *somewhere* is to be *someone*” [emphasis in original] (p. 90).

The concept of place-based identity arises from the idea that individuals experience reality through a sense of place. According to Cheng et al. (2003), “sense of place” encapsulates the idea of “rich and often powerfully emotional sentiments that influence how people perceive, experience, and value the environment” (p. 87-88). Places are not only “physical backdrops of human action,” rather, “places constitute those actions” and help people “find order and meaning in the world” (p. 88). Cheng et al. (2003) discuss the possibilities for place-based collaboration within management of local natural resources, and argue that geographic location and connection is a “central organizing principle” for many place-based collaborative partnerships (p. 88). Amenity migration, or movement to rural areas for their aesthetic beauty, reinforces ideas of place-attachment (Gosnell & Abrams, 2011). As more people move to and visit beautiful, ecologically intact environments, the landscape is altered. The consequential urbanization is one of the ways that human beings are reshaping the desert landscape.

In summary, the Desert Southwest is riddled with value assumptions and myths that predispose it to exploitation by entities that hope to alter, and economically profit off of, an apparently “open” landscape. Meanwhile, human activity overall appears to be increasing in the California Desert, which has allowed for more environmental activism as well as more anthropogenic threats to the relatively intact, fragile desert ecosystem. The California Desert, with its harsh environment and high biodiversity, is an interesting study site for conducting research on human perceptions of wildlife. In the study that follows, I argue that the desert tortoise as an icon encapsulates the desert mythos, as it reflects a kind of rugged toughness not only through its aesthetic appeal, but also through

its survival adaptations and its position in the human imagination, which is shown throughout the following chapters of this thesis.

The Tortoise

The desert tortoise occupies areas of the Mojave dominated by creosote bush and white bursage, thriving off of an herbaceous diet of perennial grasses and cacti, supplemented by minerals found in the soil and weathered bone (Germano, Bury, Esque, Fritts, & Medica, 1994). The desert tortoise reaches maturity around 15 years old and occupies a large geographic range that includes the Mojave Desert, Sonoran Desert, and Sinaloan thornscrub habitat (although it depends which particular species of desert tortoise you're looking at—there are three, and we are focused on the Mojave), burrowing into valleys and under washes to escape the unyielding desert heat and to hibernate in the winter months (Bury & Germano, 1994; Darlington, 1996). The tortoise's shell is typically about a foot in length, and when the tortoise is not moving, may resemble a rock. Darlington (1996) observed how the tortoise, “with its shieldlike shell and furrowed breastplate or ‘plastron’—resembles a knight in mottled armor” (p. 226).

The literature on desert tortoise biology and ecology has been extensive, as evidenced in the Desert Tortoise Annotated Bibliography, compiled by Berry, Lyren, Mack, Brand, & Wood (2016) that includes research from 1991 to 2015. Over 400 studies are included in the bibliography, including ones looking at the desert tortoise's

genetics, behaviors, reproduction, physiology, disease, and spatial distribution. Generally, research demonstrates that male desert tortoises need more space than female desert tortoises, with males having anywhere from 8-50 hectares of territory and females having about 1-18 hectares of territory, all dependent on the productivity of a given year, the spatial area being researched, and what particular study you're looking at (Desert Tortoise Annotated Bibliography, 1991-2015). At any rate, this translates to a wild adult tortoise having *at least* 2.5 acres of territory, and potentially up to over 100 acres of territory. The annotated bibliography also includes research done on anthropogenic impacts and implications for management of tortoise populations into the future. Climate change, and its consequential drought, has everything to do with the productivity and rainfall of a given year in the Mojave. During dry years, foraging is challenging for tortoises, and results in a "reduced metabolic rate" as well as a "net loss of energy" (Oftedal, 2002; Peterson, 1996; Desert Tortoise Annotated Bibliography, p. 55). According to Morafka and Berry (2002), "ancestors of desert tortoises stabilized as a modern morph about 17–19 million years ago, 12 million years before the formation of deserts in North America," suggesting that their adaptations to such an arid environment is relatively recent (Morafka & Berry, 2002; Desert Tortoise Annotated Bibliography, p. 6).

The desert tortoise has been a culturally significant species for thousands of years, having been considered sacred and utilized in ceremonial practices by a number of indigenous tribes in the desert southwest, including the Chemehuevi, Cahuilla, and Mojave (Schneider & Everson, 1989) (Figure 2). The Chemehuevi Tribe, native to the

eastern area of California along the Colorado River, would use the tortoise as food, utensils, and also in the context of symbolism and story (Schneider & Everson, 1989). Some tribes, such as The Mojave Tribe, would use the tortoise in story and symbolism, but not as food or tools (Schneider & Everson, 1989). Although the taking of the animal is illegal under the ESA, the importance of the desert tortoise in indigenous symbolism and story remains. According to Schneider and Everson (1989), “the unique characteristics of tortoises, sharply contrasting with those of other animals—their physical form, long life, relatively slow pace of travel, and other behaviors” contributes to their symbolic importance (p. 6).

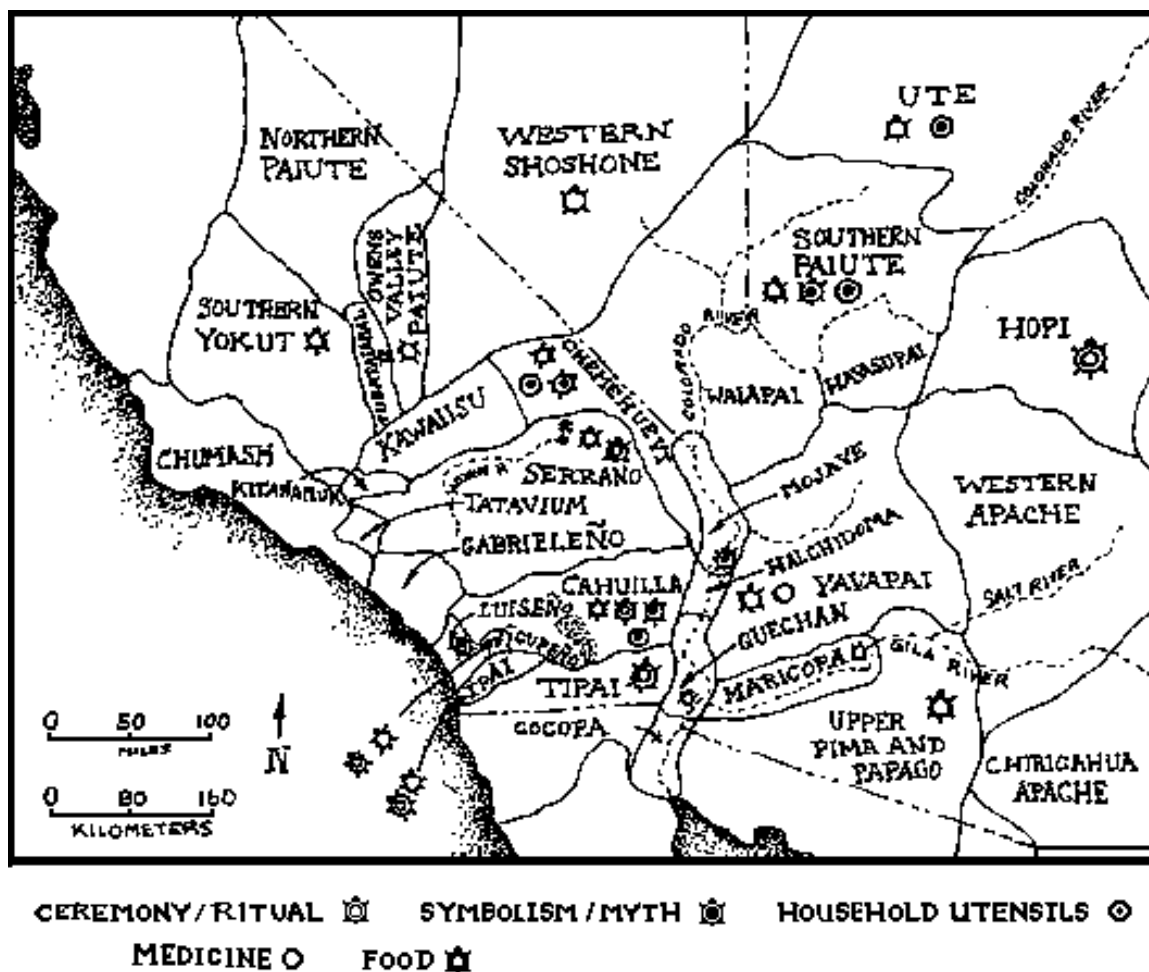


Figure 2. Map of tribal uses for tortoise (Source: Schneider & Everson, 1989)

It is necessary to understand human/nonhuman connections to the desert landscape considering the plethora of local activism that has been carried out by leveraging the desert tortoise as an iconic species. As outlined by the previous section, the California Desert has a history of contested uses and environmental activism. In this literature review section, I discuss specific acts, legislation, and other activism that the desert tortoise played an integral role in.

Threatened, well-known animal representatives, such as the polar bear, the spotted owl, or the desert tortoise, hold particular significance not only politically, but also as cultural icons. Scholars have explored this kind of cultural iconicity through flagship species research. Flagship species, or popular charismatic animals used to inspire public interest, have been looked at for their potential to rally support for ecosystem conservation in numerous contexts (Belbachir, et al., 2015; Jepson & Barua, 2015; Kaltenborn, Andersen, & Gundersen, 2014; Smith & Sutton, 2008).

According to Jepson & Barua (2015), flagship species are able to “galvanize interest and action in ways that the majority of other species cannot” (p. 95). These species also affect human culture by virtue of the animals’ “connections with other entities (institutions, publics, states) or ideas, myths, values, etc. that interact to bring benefits to the wider ecological systems in which they are implicated” (Jepson & Barua, 2015, p. 98). They also “afford particular forms of representation and occupy positions in frames that organize how people, individually and collectively, make sense of the complex world they inhabit” (Jepson & Barua, 2015, p. 99). According to Kaltenborn et al. (2014), flagship species are deemed “most effective” in helping conservation goals if they resonate with local values and if they are “linked to the protection of cultural symbols and cultural identity” (p. 175).

In *Conservation by Proxy: Indicator, Umbrella, Keystone, Flagship, and other Surrogate Species*, Caro (2010) explains terms describing species that occupy various important roles in an ecosystem, politics, and/or human society and culture. The desert tortoise could arguably fall into any of Caro’s defined categories. Broadly, surrogate

species, or “species that are used to represent other species or aspects of the environment to attain a conservation objective,” fall into three categories, Caro argues (p. 1). The first category includes those that help determine “areas of conservation significance,” and encompasses umbrella and keystone species (p. 15). Keystone species are regarded as species that are ecologically necessary to the healthy functioning of a given ecosystem, including for example beavers or sea otters (Mills et al., 1993). Mills et al. (1993) categorize beavers and sea otters as a particular subset of keystone species, called modifiers. The desert tortoise would also be categorized as a keystone modifier, since their burrows provide significant alterations to the landscape that are utilized by numerous other animals. Another type of surrogate species in this first category defined by Caro (2010) is umbrella species. Umbrella species are species that “cover sufficient home ranges of individuals of other species so that these too will have viable populations” (Caro, 2010, p. 99). Common examples include grizzly bears or mountain lions.

In the second category, Caro (2010) explains, are species that are used to demonstrate “how anthropogenic disturbance has perturbed individual health or behavior, or has affected populations, or communities,” also known as indicator species (p. 15). Some indicator species signal a change in habitat quality that may be due to human impacts, like an early warning system, since they are more sensitive to environmental disturbance. One commonly invoked narrative about this type of animal is the story of a canary in the coalmine, as canaries are more sensitive to carbon monoxide than humans. Miners carried caged canaries with them when they went underground. The birds’ demise

would indicate imminent danger to miners. The third category is of species that “are used to promote public understanding of conservation problems and to raise money,” which ultimately encompasses flagships and other surrogate species (p. 16).

There is a broad literature discussing the effectiveness of flagships in forwarding conservation goals. Some researchers have argued that the utilization of flagship species for achieving conservation goals is more effective when the values of local communities are considered in picking the animal (Bowen-Jones & Entwistle, 2002; Root-Bernstein & Armesto, 2013). Bowen-Jones & Entwistle (2002) outline ten criteria for selecting locally appropriate flagship species, including occurring endemically within the given geographical area, having a threatened or endangered status, playing an important ecological role in the system, being easily recognizable to the target audience, current usage as a symbol in the community, appearing charismatic, having cultural significance, having positive associations, existing in traditional knowledge, and having common names. The authors conclude that community perceptions should be taken into account more frequently in selection of conservation flagships, arguing that “locally appropriate flagship species, identified through research and consultation, could play a key role in encouraging a wider level of support and commitment from those who ultimately underlie the success of many conservation initiatives—local communities” (Bowen-Jones & Entwistle, 2002). Other researchers have argued against single-species management altogether, citing its narrow focus as a weakness in land management contexts (Simberloff, 1997).

Whether in favor of single-species management or not, it is indisputable that several pieces of legislation have been pushed in the name of the tortoise. Recently, military base expansion and utility-scale solar development have been controversial topics prompting heated debates due to risks to desert tortoise populations. In order to understand how the desert tortoise has been utilized as a flagship species, I have outlined some specific examples of conservation pursuits that benefitted from deploying the tortoise.

In the 1900s, the taking of tortoises from the desert to keep as household pets played a significant role in causing the decline of wild populations (Alagona, 2013). As a household pet, the tortoise appeared intelligent, tame, and even affectionate. Although the increasing domestication of tortoises wreaked havoc on the wild population, as pets tortoises rallied support for conservation and protection amongst people living in more urban and suburban areas who wouldn't ordinarily know much about the animal (Alagona, 2013). In fact, the desert tortoise "had a large, diverse, and well-organized community of advocates," and had received a high level of state and federal protection, meaning "future tortoise conservation efforts would have an enormous impact on land use and natural resource management throughout the Mojave Desert" (Alagona, 2013, p. 164). The Mojave Desert Tortoise becoming a popular backyard pet could have helped propagate its status as an icon to communities throughout its historical range, and even beyond.

The desert tortoise has been California's state reptile since 1972, but legislation created to protect the animal can be traced back to the 1930s. In 1938, California became

the first state to make the sale or purchase of the desert tortoise illegal (Alagona, 2013). According to Alagona (2013), the desert tortoise became “a vehicle, a catalyst, a symbol, a diversion, a partner, an enemy, and a potential source of political power for those who could mobilize it for their cause” (p. 164). Alagona (2013) outlines three political processes brought about by activism in the name of the tortoise that marked a new era of land and wildlife management in the Mojave Desert. The first was The Desert Tortoise Recovery Plan; the second, designated critical habitat for the tortoise; and the third, The California Desert Protection Act, which was “mainly about wilderness, not wildlife, but wildlife and endangered species, especially the flagship desert tortoise, provided a key rationale” (Alagona, 2013, p. 170).

The Desert Tortoise Recovery Plan, published in 1994, outlined a guide to eventual delisting of the tortoise. This original recovery plan said that, if followed, delisting could happen as early as 2019. The population density goal was to have “a minimum density of at least 10 adult tortoises per square mile” within each of the recovery units (U.S. Fish and Wildlife Service, 1994). Current recovery targets are based on trends within individual recovery units rather than specific target numbers (U.S. Fish and Wildlife Service, 2011). Historical population densities are unknown but have clearly declined significantly according to anecdotal evidence (Berry & Nicholson, 1984). Critical habitat was also established in 1994, and according to the U.S. Fish and Wildlife Service in 2011, there are 2,602,968 hectares of designated critical habitat for desert tortoise throughout four states (Arizona, California, Nevada, and Utah). In the 2011 update to the recovery plan, it is written that “recovery criteria could be met by

approximately 2025” (U.S. Fish and Wildlife Service, 2011). Clearly, the potential for recovery appears elusive.

According to the U.S. Fish and Wildlife Service (USFWS), tortoise populations in critical habitat have declined about 50% between 2005 and 2014 (Berry et al., 2016). The Desert Tortoise Critical Habitat is one form of protection of desert land that exists because of the threatened status of the tortoise. These habitats were broken up into six recovery units in 1994 (and later changed to five in 2011). Recovery efforts were reevaluated in the 2011 Recovery Plan, where it was determined that we could improve recovery results if we would develop “partnerships to facilitate recovery,” “protect existing populations and habitat,” “augment depleted populations,” “monitor progress,” “conduct applied research,” and “implement a formal adaptive management program” (USFWS, 2011).

The tortoise played a central part in passing the California Desert Protection Act of 1994, which added millions of acres to both National Parks and the Wilderness System (Alagona, 2013). Stories surrounding the Act illuminate how desert tortoises are used as tools to galvanize support for their habitat. In 1989, Patty and Elden Hughes traveled across the country to gain congressional support for the Desert Protection Act. They took five baby tortoises to Washington, D.C., receiving an abnormal amount of attention thanks to the “little lobbyists” (Wheat, 1999). When the couple was told by an airport guard that they couldn’t take pets into the passenger compartment of the plane, Patty asserted that “they aren’t pets, they’re lobbyists” (Wheat, 1999, p. 151). The tortoises were, in a way, lobbying for the conservation of their ecosystem. “You’ve got my vote,”

said one congressman in D.C. who was holding a tortoise while hearing Elden's pitch for the Desert Bill (Wheat, 1999, p. 152). Consequently, the tortoise's capacity to assist in passage of this keystone legislation resulted in the protection of not only fragile desert habitat, but also of the flora and fauna that live there. The passage of this bill made the Southern California Desert the largest wilderness area in the continental United States (Wheat, 1999).

Of course, since the early 1990s, one reason to deploy the tortoise in conservation pursuits as a flagship has been its listing under the Endangered Species Act (ESA). The ESA, signed by President Nixon in 1973, forever changed conservation in the United States. The tortoise's state and federal listing, which took place in 1989 and 1990, put the species at the forefront of desert conservation, and environmental activism in the Mojave has had a significant political relationship with the desert tortoise since then (Alagona, 2013).

Recently, translocation of desert tortoises has been a contentious issue in the California Desert, and environmentalists have deployed research to demonstrate conflicts with translocation in debates surrounding development. In a legal challenge to the translocation of over 1,100 tortoises from the Twentynine Palms Marine Corps base, the Center for Biological Diversity claimed that although "translocations are implemented to 'save' tortoises," they often "end up hurting or killing the animals" (Anderson, 2016). In response to environmentalists concerns, the Marine Corps "has allocated \$50 million for the airlift, environmental assessments, fencing, research, and health monitoring of the tortoises through the year 2045" (Perry, 2016). As evidenced by the aforementioned

conflict, translocation of tortoises has been contentious and longitudinal impacts remain relatively a mystery to researchers. Initial studies demonstrate that translocation of tortoises has been tied to disease outbreaks and tortoise death. Following a translocation of tortoises from Fort Irwin National Training Center in California, a study by Aiello, et al. (2014) demonstrated that relocating tortoises to unfamiliar areas could spark disease outbreaks among both the moved tortoises and the tortoises already living in the area. This study is in part what prompted the Center for Biological Diversity filed a notice to challenge the Marine Corps tortoise relocation plan, which ended up relocating over 1,000 desert tortoises, under the ESA in 2016 (Anderson, 2016). More recent research has suggested that translocated males might not be fathering offspring (Mulder, et al., 2017). The Center for Biological Diversity and other environmental organizations deploy these research findings in resistance to development of the desert.

Since the desert tortoise “served as a catalyst for many changes, and much of the conservation work in the Mojave has been accomplished in the tortoise’s name,” it is impossible to separate the role of the species in desert protection from the role of those in the human activist community (Alagona, 2013, p. 173). Along with having social, political, and legal significance to the state of California, the desert tortoise has also influenced federal spending, with conservation efforts likely adding up to more than one billion dollars (Alagona, 2013). According to the Revised Recovery Plan for the Mojave Population of the Desert Tortoise, the total estimated cost of recovery is “\$159,000,000 plus additional costs that cannot be estimated at this time” (USFWS, 2011).

Today, the desert tortoise is considered “conservation reliant,” meaning that the species relies on political protections to avoid extinction (Averill-Murray, Darst, Field, & Allison, 2012). Development and climate change have been two primary concerns of tortoise advocates. A rise in average temperature and a higher risk of long-term drought are particularly concerning for animals such as the desert tortoise living in an already arid environment, such as the California Desert, that could fare much worse much sooner.

With the tortoise’s flagship status, and its high risk of extinction, the species can garner support for protection of other at-risk desert species. According to Kyne & Adams (2016), “linking the possibly intimidating message of extinction to a call for action draws on evidence that combining fear with appeal to act is an effective communication tool if the audience feels able to effect change” (p. 472). This is significant since the desert tortoise is listed as “threatened in Arizona, California, Nevada, and Utah,” where populations are seemingly dwindling (Lovich et al., 2014, p. 215). With this status of “threatened,” the species is currently protected under the federal U.S. Endangered Species Act. There has been some internal debate within the California conservation community about whether or not the Mojave Desert Tortoise’s official listing should be changed to “endangered” as populations continue to decline rapidly.

According to Lovich et al. (2014), secure habitat for the tortoise will diminish considerably if current climate warming trends continue. This comes as no surprise considering that tortoise populations have already dropped dramatically since 1996 due to incessant drought (Lovich et al., 2014). The species’ listing on the International Union for Conservation of Nature (IUCN) Red List as *vulnerable* in 1996, meaning that its

likelihood of going extinct in the next 20 years is at least 10%, was recently reassessed. As of 2018, The International Union for Conservation of Nature's Species Survival Commission (IUCN/SSC), Tortoise and Freshwater Turtle Specialist Group, now considers the Mojave Desert Tortoise to be *critically endangered* (Turtle Conservation Coalition, 2018). Part of the reason for this change is the desert tortoise being split into three separate species: *Gopherus agassizii*, or the Mojave Desert Tortoise (with a range of Southern California, Southern Nevada, Southwestern Utah, and Northwestern Arizona), *Gopherus morafkai*, and *Gopherus evgoodei* (Turtle Conservation Coalition, 2018). This new label suggests a heightened sense of urgency surrounding the population viability of the Mojave Desert Tortoise, and forces diligent biologists and conservationists to reflect on changes since the tortoise's original listing and recovery strategies from the 1990s. In fact, in the *Top 25+ Turtles in Trouble* report, the Turtle Conservation Coalition (2018) cites the "inability of regulatory and management agencies" to protect the species and its habitat as a primary reason for its decline, along with urbanization, habitat loss, climate change, and disease (Turtle Conservation Coalition, 2018, p. 62).

As evidenced by the literature, there has been some exploration of desert tortoise biology, ecology, and political history. However, questions about the tortoise's role in human culture and society have been largely unanswered. These questions are particularly important given the significant anthropogenic impacts on tortoise populations, and the consequential necessity to understand not only nonhuman roles in

our human stories, but also what might be lost—more than just physically and ecologically—with the tortoise’s ongoing disappearance.

The Anthropocene

“And so the Dodo entered into written accounts as a species driven to extinction by human activity, its fate strangely bound up with a dawning historical awareness that human activity might not just kill individual plants and animals, sometimes in their thousands, but also bring to an end whole ways of life. As a result of this awareness, the loss of species might be understood and narrated in a way that significantly implicates us—causally, perhaps emotionally, and certainly ethically. This is our sad inheritance from the Dodo.”

--Thom van Dooren, Flight Ways: Life and Loss at the Edge of Extinction

Recent scientific findings suggest that there is currently a mass extinction event occurring, the likes of which have not occurred on Earth for the last 65 million years (Ceballos et al., 2015). “The window of opportunity” to re-diversify the living world, they say, is “rapidly closing” (p. 4). According to Rockstrom (2009), the rate of extinction of species today is “estimated to be 100 to 1,000 times more than what would be considered natural” (p. 474). For the Mojave Desert Tortoise, despite being “one of the most intensively studied and monitored reptiles in the world” (Turtle Conservation Coalition, 2018), populations continue to decline at an alarming rate, mostly due to human activity.

The implications of climate change and anthropogenic impacts on tortoises and their habitat are significant. First of all, development and urbanization contribute to the

expansion of predator populations, specifically that of ravens, that have resulted in higher rates of tortoise mortality (Lovich & Bainbridge, 1999). A prediction of annual mean temperature suggests that there will be an increase of 3.5-4 degrees Celsius in the Desert Southwest as global warming persists (Christensen et al., 2007). This will cause drought and have serious, long-term effects on desert tortoise population viability. The current threats to tortoise persistence, including the growing threats of climate change, development, and increasing predation, coupled with their slow reproduction rate, reify the importance of understanding the possibility of local extinction(s) in the Morongo Basin (and all of the Southwest Mojave) and the cultural impacts that would ensue.

Valuing endangered species is first and foremost a cultural phenomenon rather than an ecological one. This is the central idea argued in Ursula Heise's book *Imagining Extinction: The Cultural Meanings of Endangered Species* (2016), where the author argues that "biodiversity, endangered species, and extinction are primarily cultural issues, questions of what we value and what stories we tell, and only secondarily issues of science" (p. 5). To focus on the narrative surrounding a threatened species, Heise (2016) posits, allows people to connect with larger social networks. Analysis of stories about endangered and extinct animals can help us understand not only "what makes us collectively care about the well-being of nonhuman species," but also help us see "what kinds of stories and genres might be more successful at generating this concern than others" (Heise, 2016, p. 13).

With the reality of a human-caused mass extinction occurring at the present time, researchers have yet to understand the socio-cultural significance of biodiversity losses

(Cafaro, 2015). Kolbert (2014) notes that approximately “one-third of all reef-building corals, a third of all freshwater mollusks, a third of sharks and rays, a quarter of all mammals, a fifth of all reptiles, and a sixth of all birds are headed toward oblivion” (p. 17). According to Ceballos et al. (2015), the loss of biodiversity directly threatens human-wellbeing by inhibiting important ecosystem services. Cafaro (2015) poses three ways of thinking about the sixth extinction event: first, as a mistake; second, as a crime; and third, as inevitable. “The key moral fact,” he suggests, “appears to be humanity’s refusal to control itself” (p. 389). The reality is that tortoises are especially vulnerable to anthropogenic environmental threats due to their many alluring qualities (as food and as pets, for example), such as the ease with which they can be captured, making extinction appear imminent (Stanford, 2010). This, coupled with the sensitivity of their desert habitat, makes the desert tortoise one of many species on the front lines of the sixth extinction. In just a couple of human generations, wild tortoises might be merely a story told of the past, their kin surviving only in terrariums, backyards, and folktales.

The literature I have surveyed in this chapter demonstrate how the California Desert’s history, the tortoise’s ecology, and the context of the anthropocene situate the desert tortoise in conservation. In summary, through the lens of species surrogacy, the literature describes the desert tortoise as playing several important ecological and cultural roles. This literature informs my research methodology and methods by highlighting the lack of social science research on how the tortoise fulfills these roles, inspiring me to utilize narrative inquiry, grounded theory, and mixed qualitative methods. The next chapter highlights how using these methodologies and methods can inform desert

conservation strategies. The study that follows contributes to the literature about the desert tortoise's place in social and ecological landscapes, and how the animal's place in the human imagination can be broadly related to environmental struggles during the sixth mass extinction.

CHAPTER 2: METHODOLOGY AND METHODS

When research is conducted by interviewing people who are connected to an animal, a place, or both, the researcher has the opportunity to hear stories, beliefs, and perceptions about the ties that bind individuals to a landscape or its wildlife. This research isn't about finding the definite solutions to the desert tortoise's decline; rather, it is an attempt to learn about how individuals and communities relate to an iconic animal that is disappearing from the landscape before our eyes. How has a nonhuman species exhibited forms of agency in local politics, policy, and perception of place in the world? How are people conceptualizing—and coping with—its disappearance? To approach these questions, I examine how the stories about one iconic, beloved, and threatened animal are told by those who spend much of their professional and private time working with this species or its habitats. These stories provide a window to understanding why desert conservationists choose to focus on tortoises, and by extension, what the loss of endangered flagships might mean for the future of conservation.

I argue that the best way to examine this relationship between the desert tortoise and its human advocates is qualitatively. Sitting down and talking to people can garner responses that a survey, or a statistical analysis, might miss. In each word, and in each conversation, there are small pieces of the puzzle speaking to human experience. The desert tortoise's undeniable part of experiencing our desert comes across clearly in this qualitative research. These components of human connection to the desert tortoise offer a view into the socio-cultural implications of the sixth mass extinction.

Qualitative research acknowledges that, “participants construct the meaning of a situation, a meaning typically forged in discussions or interactions with other persons” (Creswell, 2009, p.8). Creswell states that qualitative research “is exploratory,” and might be needed to address a topic that is new, or a topic “that has never been addressed with a certain sample or group of people” (p. 22). This idea of utilizing qualitative research strategies to explore and address a new topic with a specific sample group has been integral to my research process, as social science research has not been conducted on desert conservationist’s relationship to the Mojave Desert Tortoise. Strategies associated with the qualitative research approach that I utilize in my analysis are narrative inquiry and grounded theory.

Narrative Inquiry

“Being in the field, that is, engaging with participants, is walking into the midst of stories.”

--Clandinin, 2006

Narrative inquiry, or narrative research, is a qualitative research methodology that is implemented under the assumption that human beings are storying creatures who lead storied lives (Mendieta, 2013; Clandinin, 2006). Stories allow people to interpret and assign meaning to their experience (Mendieta, 2013). Since the human relationship to the desert tortoise is a fundamentally experience-based one, the questions surrounding the significance of this relationship are best suited to be answered through the lens of narrative analysis. Results of my research highlight that the conservation community’s

connection to the desert tortoise is understood through individual and cultural stories, metaphors, and experiences.

This research utilizes both types of narrative research outlined by Polkinghorne (1995), which includes an analysis of narratives and a narrative analysis. The former is an analysis of what is essentially already formatted into a story, while the latter may not be working with data that is conveyed through traditional story format, but takes that data and shapes it into a narrative. Since some of my interview questions elicit story (i.e. “Tell me about personal experiences you’ve had with the desert tortoise”), I am enacting an analysis of narratives. However, since most of my questions do not serve to elicit a traditional narrative structured response, I utilize a narrative analysis to story my data. In short, although not all interview questions were answered with traditional “stories” (a plot with a protagonist and conflict), data elements were organized as results building on a cultural story. Narrative inquiry goes “beyond the use of narrative as rhetorical structure, that is, simply telling stories, to an analytic examination of the underlying insights and assumptions that the story illustrates” (Bell, 2002, p. 208).

Narrative analysis represents a move away from positivism and post-positivism (Mendieta, 2013; Clandinin, 2006). Narratives are “powerful constructions,” Bell (2002) argues, and “can function as instruments of social control as well as valuable teaching tools” (p. 209). Utilizing narrative inquiry as a methodology allows researchers to challenge “elitist scholarly discourses” and encourage participation of traditionally marginalized voices in research (Bell, 2002). According to Bell (2002), much research simply “looks at outcomes” while disregarding the impact of experiences (p. 209). To

analyze data through a narrative lens of analysis allows the researcher to approach the data holistically and recognize its subjective nature.

Finally, narrative is “naturally co-constructed,” and so in narrative research, relationships and research purposes are collaboratively created (Mendieta, 2013, p. 139). This is in line with grounded theory, the other methodology I utilized in my study, which will be discussed in the following section.

Grounded Theory

The idea that every researcher has implicit bias has been gathering growing consensus within social science research. This is in line with standpoint theory, or having a “view from somewhere.” Denzin and Lincoln (2005) note that within every researcher exists experiences and language from “a particular class, gender, racial, cultural, and ethnic community perspective,” which reflects the inherently “multicultural, gendered components of the research act” (p. 21). Individual researchers are undeniably coming from a place of both implicit and inherent bias. According to Charmaz (2005), wearing the deceptive cloak of objectivity has detrimental implications for research in constructivist grounded theory and social justice.

Firstly, there exists an illusion that scientific and academic research is bounded strictly by rationality and not by emotion. Charmaz (2005) emphasizes that research does not exist in a social vacuum; rather, researchers bring “past interactions and current interests” into their research, and that “contested meanings of ‘shoulds’ and ‘oughts’

come into play” (p. 510). This not only allows, but encourages researchers in constructivist grounded theory to bring their own interpretations to the table. Some positivists and postpositivists might argue that “data, evidence, and rational considerations shape knowledge,” and that being objective, then, is “an essential aspect of competent inquiry,” therefore bias must be avoided at all costs (Creswell, p. 7-8). However, for feminist epistemologists and constructivist grounded theorists, “no analysis is neutral—despite research analysts’ claims of neutrality” (Charmaz, 2005, p. 510). Similarly, for social justice researchers, it is important to understand the assumptions one carries into the research process (Charmaz, 2005, p. 511). According to Charmaz (2005), constructivist grounded theorists do not seek to eradicate empiricism, rather to remain open, flexible, and reflexive during the research process, allowing the researcher “to pursue emergent questions,” and thus shift the “direction of inquiry” (p. 512). It is these means of inquiry that will ignite and foster critical analysis of hegemony and domination, as well as “agency, power, status, and hierarchy” (Charmaz, 2005, p. 512). A lens shrouded as objective could simply perpetuate social constructions upholding systems of privilege and domination, which is precisely what constructivist grounded theory rejects.

Finally, self-reflexivity and admission of biases, both implicit and explicit, are inextricably intertwined with the research process if it is to be successful in revealing power structures affecting research goals and/or outcomes. This challenge to the rational/emotional dichotomy is built into social justice theoretical frameworks including standpoint theory and constructivist grounded theory, and is important in revealing the façade that is total objectivity. As conveyed concisely by Denzin and Lincoln (2005),

“there are no objective observations, only observations socially situated in the worlds of—and between—the observer and the observed” (p. 21). I believe that to claim objectivity is to be even more deceptive than claiming ones’ own biases, which are unavoidable and inherent in existing as a social being. Thus, together, narrative inquiry and grounded theory allow me to conduct meaningful research that is situated in subjective, lived experience.

Methods

As noted at the beginning of this chapter, I utilized a mixed-methods approach, including semi-structured interviews, participant observation, and discourse analysis. Snowball sampling was used to recruit participants by reaching out to members of the community and having them assist in identifying other potential interviewees (Berg, 2009). Interviewees included individuals who work with desert conservation and/or tortoise conservation in varying capacities. Some participants work for government agencies (n=5) and others work for nonprofits or non-governmental organizations (n=7) (Table 1). The snowball sampling I utilized enabled me to connect with many individuals from conservation organizations and agencies, so I ultimately decided that for the purposes of this thesis, I would tell the story of this particular community’s connection to the tortoise. It should be noted that the stories of those whose interests often clash with tortoise conservation (i.e. developers, some politicians) are not included in this thesis, but I believe that their stories are important to collect and interpret as well.

Semi-structured interviews were conducted with a total of 12 adults, including both men (n=7) and women (n=5) who have been involved with the conservation community in the desert southwest. Semi-structured interviews are typically interviews guided by an unfixed list of open-ended questions, allowing for flexibility in phrasing and follow-up questions (Newing, 2010). Interview questions were situated around how participants' experiences with the desert tortoise have impacted their understanding of the Mojave ecosystem, feeling of connection to place, and of their conceptualization of tortoise disappearance (Appendix). In accordance with grounded theory, I continuously developed my questions around the concerns displayed by participants, or co-researchers (Charmaz, 2005).

Table 1. Interview participants

Federal Agency Employees	Nonprofit or Non-Governmental (NGO) Employees
United States Fish and Wildlife Service (n=1), United States Geological Survey (n=1), National Park Service (n=3)	National Parks Conversation Association (n=2), Desert Tortoise Preserve Committee (n=1), Mojave Desert Land Trust (n=1), Morongo Basin Conservation Association (n=1), Native American Land Conservancy (n=1), Copper Mountain College (n=1)

With consent, all 12 interviews were recorded on a portable audio recorder. Written notes were also taken during the interviews. Written notes were also taken at community events that I attended, where I utilized participant observation techniques. Following guidelines to conduct research with human subjects, an application to pursue this research was approved by Humboldt State University's Institutional Review Board on May 2nd, 2017 (IRB 16-247). Participants reviewed and signed informed consent forms prior to being interviewed.

Spending time in the Morongo Basin as well as the Coachella Valley familiarized me with the cultural landscape of the California Desert. Participant observation also assists with rapport building and fulfilling the requirements of grounded theory and narrative inquiry. Participant observation is a particularly effective supplement to other qualitative data gathering strategies for someone who is already somewhat familiar with the community of interest (Newing, 2010).

The study area was primarily the Morongo Basin in California, which encompasses the Joshua Tree National Park Gateway Communities (Figure 3). Interviews primarily took place in Twentynine Palms and Joshua Tree, California, although some took place in Palm Springs, Riverside, and Barstow, California. This location was chosen based on my own familiarity with the area, but as research demonstrates, this area—the southwestern Mojave—is also a place of especially threatened tortoise populations.



Figure 3. Map of Joshua Tree Gateway Communities (Source: NPS, 2018)

With the interviews I conducted in the past year, my goal was to understand how the social, political, cultural, and ecological importance of the desert tortoise is reflected through individual stories and expressed in the form of collective community action against development in the California Desert. But as I pursued these questions, I found other questions emerging. Following grounded theory, I decided to allow the answers to guide the research questions, which resulted in the following:

1. Why is tortoise conservation important to many desert residents?
2. What roles (social, cultural, political, and ecological) does the desert tortoise play in the California Desert, and how are these roles demonstrated through narrative?
 - a. How are the tortoise and the desert conceptualized and perceived? By whom?
 - b. How is the tortoise incorporated/embedded into stories surrounding development and conservation?
3. What does community connection to the desert tortoise suggest about desert values, experiences, and place-based identity?
4. How are people intimately involved with the species narrating its disappearance from the landscape?
5. What do people's stories about the tortoise reveal about desert values?

Data were analyzed through transcribing and coding of the 12 interviews. Initial coding was done by combing through quotes from interview transcriptions and organizing those quotes thematically. The next stage of coding was done through Airtable, a free online application that works similarly to Excel in that it has rows and columns to assist in organization of qualitative data. To finalize my themes, I went back to Microsoft Word and organized quotes under their designated headings. I decided that each theme would be titled after direct quotes from interviewees to reinforce the idea that my data is *storied*, situated in the experience of participants. These six themes are

demonstrated in Figure 4.

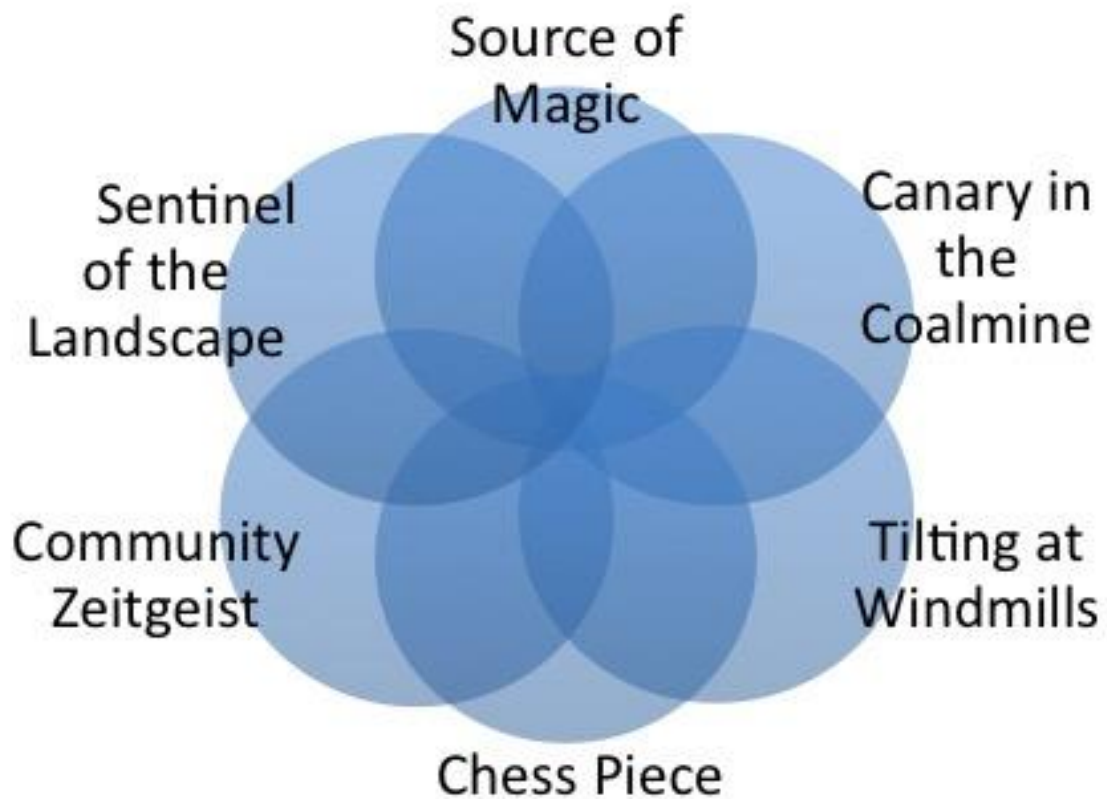


Figure 4. Venn diagram displaying overlapping themes

The six emergent themes are interrelated, and all can be conceptualized as different ways to engage with the tortoise's role in the socio-political sphere. We can think of each theme as the tortoise embodying different roles on the stage of the desert

landscape. Further, these themes (individually and collectively) contribute to the literature about the desert tortoise's iconicity and the species' success as a flagship. My literature review highlights how specific criteria have been outlined—or recommended—by scholars regarding decisions to designate species as conservation surrogates. The results of my research, shared in chapters 3-5, demonstrate that the tortoise is an effective surrogate species on several levels, and also that species surrogacy is much more nuanced than some of the literature has conveyed. Individual experience with species can be broadened, brought to the community/cultural scale, and built upon to promote conservation and to use narrative as a tool for education.

Metaphor is innate in storytelling. In my study, metaphor is part of the narratives of many participants; for example, to regard the desert tortoise as the “canary in the coalmine” (which emerged as one of the six themes) invokes metaphor. Lakoff's (1980) analysis of understanding through metaphors reflects the narrative inquiry methodology's conceptualization of understanding through storied lives. Lakoff (1980) argues that metaphors “play a central role in the construction of social and political reality,” and contribute to individual and cultural understanding (p.159). Lakoff's idea of “metaphor as a principal vehicle of understanding” reflects the themes that emerged from my data (1980, p. 160). Lakoff (1980) uses the analogy of fog as being seen in front of the mountain; the fog being perceived as “in front of” the mountain implies a specific perspective, not an objective one. He posits that, “meaning is always meaning *to* someone. There is no such thing as a meaning of a sentence in itself, independent of any people” (Lakoff, 1980, p. 184).

Lakoff's argument that human understanding exists through metaphors supports my decision to utilize qualitative research and narrative inquiry methodology:

“The fact that our conceptual system is inherently metaphorical, the fact that we understand the world, think, and function in metaphorical terms, and the fact that metaphors can not merely be understood but can be meaningful and true as well—these facts all suggest that an adequate account of meaning and truth can only be based on understanding” (1980, p. 184).

One interviewee mentioned that the desert environment can be imagined as a tabletop, and where the tortoise walks on that table, protections against ecological threats can be pursued. This research illuminates how, in a similar vein, the tortoise occupies particular places within the cultural and social landscape of the desert. The following chapter begins my results, and explores how within desert conservation, the tortoise embodies a political tool as well as a cultural symbol. Latter chapters will discuss other roles that the tortoise plays and particular place-based values that the existence of the species reflects and reinforces.

CHAPTER 3: THE CHESS PIECE AND THE DEFINING SPIRIT

The first two emergent themes—which I refer to as “Chess Piece” and “Community Zeitgeist”—explore the desert tortoise as a carefully chosen tool to promote environmentalist causes. These themes have in common that they acknowledge the human community’s role in making the tortoise a desert icon.

Chess Piece: The Tortoise as a Tool

“It [the tortoise] has been a hurdle for some people... for developers... and politicians recognize its importance as a chess piece, or a... it’s recognized as a factor that has to be recognized in politics.” –Interviewee

Chess is a game of skill and intellect in which two players strategically maneuver different game pieces with the objective of trapping or cornering the opposing player’s king piece. Each game piece has different rules and limitations assigned to its movement, and each piece is used in a way that most serves the objective of taking the other player’s pieces and ultimately achieving check-mate. To evoke metaphor about something being a chess piece, then, suggests that the object of comparison is being used in a strategic manner to reach an end goal. Comparing a desert tortoise to a chess piece elicits an idea of the animal being used to forward someone’s agenda.

The “Chess Piece” theme is oriented around the collaboration, conflict, and engagement often sparked by the common goal of tortoise conservation in California Desert communities. It also includes a discussion of political outcomes. As research has

shown, the viability of tortoise populations today and into the future depends on human efforts to manage anthropogenic impacts to desert ecosystems in sustainable ways. In a similar vein, the human conservation community can utilize the political and cultural roles of the tortoise to forward conservation goals.

This theme emerged from the broad consensus among interviewees that the desert tortoise is used as a tool, a rallying point, a source of conflict, and/or an initiator of collaboration in conservation (n=7). The Endangered Species Act listing is commonly recognized as being an important aspect of the tortoise's status as the California Desert's flagship species. A U.S. Fish and Wildlife Service (USFWS) employee stated:

“With tortoise being a part of every project, that really enables us to pull as much conservation value as we can out of these projects, and if you remove that then you obviously remove a huge mechanism for—at least at the level that I operate at, the federal regulatory level—you remove a huge mechanism for getting conservation money and actions and measures out of projects, if tortoises were to go extinct or become not listed or whatever. The fact that we're able to consult on tortoises enables us to pull a lot of good stuff out of projects.”

Along with being a mechanism for conservation, the desert tortoise has also been used as a tool to foster intergroup communication. In talking about tortoises and policy issues, an attorney for the Native American Land Conservancy (NALC) said, “I have found that people care very deeply about tortoises. And I think that it's been helpful in *unifying* different communities” [emphasis added]. In line with flagship species literature, another interviewee said that, “as far as the community, it is a, sort of a, *rallying point*: an easily identified icon to engage community conservation efforts. So, many of the local conservation efforts of course are sort of built around it [the tortoise] in this area. And if it disappeared, went extinct, they would have to be retooled around something else, some

other species or some other idea. And that may happen” [emphasis added]. This concern about extinction will be discussed more in-depth in other themes.

One interviewee noted that, “the tortoise is “iconic of the desert,” it can “resonate with tourists, and visitors, and outsiders,” and that for “local communities that depend on tourism dollars, that impact is important.” This idea that the tortoise plays a role in tourism, particularly in the study area of the Morongo Basin, was commonly referenced in interviews. Four participants specifically brought up the role of wildlife in tourism, while others mentioned the economic implications of tortoise survival in other ways. An employee at Joshua Tree National Park (JTNP) said:

“I think if you searched on the internet or looked on people—you know, businesses, you’d find a lot of tortoise logos, you know. I think people have connected themselves with the tortoise. I think there is pride in the local communities when it comes to conservation, and the protection of desert lands.”

The tortoise’s role as a public engagement tool commonly represented in businesses was recognized in several interviews. This usage of the tortoise as an icon in economic contexts highlights the species’ importance across different social and economic avenues. The animal is a political tool, and it appears to be also an economic one. This point was echoed by another interviewee, who stated that, “tortoise habitat is one of the factors that people use to determine the value of conservation lands. The tortoise is an icon of the desert, so all kinds of businesses, if you go through like the yellow pages... you know, people call things tortoise this, tortoise that.”

The desert tortoise is used to encourage economic growth in the Morongo Basin in a number of ways. Their totem status is utilized by local businesses selling services

and products, as demonstrated above. The desert tortoise’s ESA listing pulls in federal dollars for desert conservation, as explained by the USFWS employee at the beginning of this section. Another interviewee said that, “the tortoise... helped develop *cooperative planning and cooperative management*... So it’s been helpful in fostering communication” [emphasis added].

An employee with JTNP told a story that highlights how the tortoise can influence cooperative land management:

Interviewee: “When the Park Service acquired the Park, of course it inherited all of those original mining and ranching roads, and [NPS] took those roads, and selected a subset of those roads to then use for the through-traffic and main routes that we have today. But those roads were never designed for, you know, giant RVs, and tour buses, and that kind of thing. So ... we had an opportunity... to look at the impact—the potential impact—of some of that roadwork to tortoises. And if you drive through the Park today, you’ll notice that a lot of the curbing has cuts in the curbs, and they’re these notches... I want to say every 100 feet or every 50 feet, you’ll see a notch in the curb, those are—we nicknamed them tortoise trots.”

Me: “Oh, okay, yeah, that makes sense.”

Interviewee: “Yeah. So ... the concern is they [hatchling and juvenile tortoises] wouldn’t be able to get up and over those curves. ... So, so this was sort of a *compromise*, we wanted the curbing to really keep cars on the road and in designated parking areas, but we didn’t want to impact tortoises that might be trapped along those curves. ... The idea is that if you had notches every so often, an animal, you know, could be exposed in not a good way if it’s hot during the day and they’re out there on the baking road and they’re, like, trying to get up—that eventually they would hit one of those notches and they’d be able to walk up the ramp. And I think we’ve got some great photographs of tortoises using those notches. And one of those photographs was literally within, I want to say, like 48 hours of the curb getting poured, and here’s this tortoise, scootin’ through the little tortoise trot, you know? And you try things, I mean that’s a lot about land management, is you don’t have all the answers but you’re trying to experiment with things and you know, try to assess what your impacts might be and mitigate them, and in that case it was great that it worked” [emphasis added].



Figure 5. Tortoise using a "tortoise trot" (Source: NPS, 2001)

These data demonstrate that the conservation community in the California Desert utilizes the tortoise as both a political ally and as a tool to further conservation goals, and further, that it is used as an advertising icon for desert businesses. The quotes that I have presented in this section reveal how one species can have such a profound influence on politics in a place.

The next theme that I will discuss, Community Zeitgeist, similarly demonstrates that the tortoise acts as a unification point/mechanism for the desert community (or, different desert communities). The Chess Piece and Community Zeitgeist themes are closely related. Where these themes diverge is the point of intentional maneuvering. We can think of the Chess Piece theme as the intentional act of watering a seed in the

community garden, and the Community Zeitgeist theme as the budding plant growing through the soil. The outcome (the plant) is viewed as a source of nutrition for people in the community. The tortoise's usefulness as a socio-political tool feeds into its iconicity, and its integral role in desert communities, as will be explained in the next section.

Community Zeitgeist: The Tortoise as the Defining Spirit of Desert Conservation

“The images of tortoises, they’re in jewelry, they’re in media, they’re in the community zeitgeist here... so I think to lose it would be a significant loss in different ways for the community. It would be harder to protect the environment, too, because without that species being there as a reason to protect, a lot of the less visible species of plants and insects and other animals, it would be easier to lose them too.” –Interviewee

With zeitgeist referring to the particular spirit of a place and time, the suggestion that the tortoise is deeply interwoven with desert zeitgeist is significant. This theme emerged through numerous interviews, particularly from the idea of the tortoise becoming an icon and a representative for a particular place and time: the *place* is the California Desert, specifically the Morongo Basin, and the *time* continues from the late 1980's-early 1990's, when the tortoise was listed as threatened and began becoming iconic of desert conservation, on to today.

Interviewees often cite the presence of tortoise as an important component of conservation. An employee with MDLT exemplified this point, stating, “one criteria that exists almost always [in choosing land to buy and conserve] in the background is, ‘are there tortoise there or not?’ Because if there’s tortoise there, then we know it’s good conservation land.” This participant’s response also highlights the tortoise’s role as an

ecological indicator species. A professor at Copper Mountain College echoed this idea of the tortoise's presence helping to determine whether land will be designated for conservation or development. He recalled that, "if no tortoises were present, it would be easier to develop—there'd be one less hurdle. So, in that sense, would that be good or bad? If you're a developer it'd be great... less expense. That's hindered a lot of development around here, or slowed it." The ability to slow development has made the tortoise iconic of a pristine, open desert.

An employee with the National Park Service (NPS) cited the legal obligations to protect habitat for endangered species, as well as implied the tortoise's function as an umbrella species, explaining the tabletop metaphor that I introduced earlier. She noted how "the tortoise gets to represent a lot of other species—a lot of desert life. Where a tortoise is walking around, you know, if you think of a place where a tortoise is walking around as like a table top, and everywhere he walks on the table top gets a little bit of extra status. ...In the country we have a lot of political animosity towards, say, spotted owls, or delta smelt, and I have not heard people attack or talk about desert tortoise in the same way." This suggests that perhaps tortoise conservation is less contentious than conservation strategies for other listed species, such as the northern spotted owl, making it a more agreeable community icon. This could have to do with how conflicts between some communities and a listed species—for example, the conflicts between the logging industry and the spotted owl—have a more noticeable economic impact on the local community. There have been conflicts between sheep and cattle farmers and tortoise conservationists, but they don't get as much press on a national level. The desert tortoise

having less “haters” than the spotted owl could also speak to the tortoise’s success as a widely accepted flagship species.

In recalling the tortoise’s iconicity and symbolism of desert conservation, a Mojave Desert Land Trust (MDLT) employee posited that utilizing the desert tortoise as inspiration to protect desert landscapes reflects “the same way that when people want to inspire about baseball, they talk about Babe Ruth or Jackie Robinson, you know? They—it helps clear people’s focus and make them connected to whatever it is that you’re talking about.” He also recalled that, “every good movement needs heroes,” and “the tortoise is totally a hero of the conservation movement.” This participant’s reflection on the desert tortoise as an emblem to inspire conservation echoes the species’ role as a flagship. As noted at the beginning of this theme’s section, the tortoise has been emblematic for a place and a time. One NPS/JTNP (National Park Service/Joshua Tree National Park) employee discussed the origins of the tortoise’s flagship status:

“I don’t think it was really until maybe the ‘80’s or ‘90’s that tortoises became really in the forefront of conservation here, and became kind of that iconic image or that symbol of stewardship, you know, the notion of deserts being in danger, being threatened by various types of development, that sort of thing.”

A National Parks Conservation Association (NPCA) employee voiced that the desert tortoise was chosen to be the flagship of desert conservation through “a *conscious decision*, since it was the tortoise that is bearing the brunt of impacts from development” [emphasis added]. The same interviewee stated, “you know, we don’t have a mural of a tarantula on the laundromat here. Um, there are a lot of things in the desert that people would—that are potentially, you know, more important to the desert ecosystems that

people wouldn't care all that much about if they went away, but they care about the tortoise." The area in downtown Joshua Tree that the interviewee mentioned not only has a tortoise mural (Figure 7), but also has a tortoise statue (Figure 8), commemorating tortoise races that used to happen there decades earlier. Although the interviewee in this interaction discusses the idea of community care, it is hinged upon a *decision* to incorporate tortoise imagery in town, reflecting the idea that the zeitgeist results from the utilization of tortoise as a tool.



Figure 6. Desert tortoise mural on Joshua Tree Laundromat (Photo by the author)



Figure 7. Desert tortoise statue in downtown Joshua Tree, CA (Photo by the author)

During two different interviews, interviewees brought up the tortoise’s role in ensuring the passage of the 1994 California Desert Protection Act. One of these interviewees said:

“When I think about desert tortoises, I can’t help but think about how the tortoise has been an icon in conservation. So, during the 1994 California Desert Protection Act campaign they were used pretty extensively to take to lobby Congress and to lobby the Administration about protection of the desert. And now they’re really iconic, you know? Almost everybody recognizes—at least in southern California—what a desert tortoise is, and that it’s associated with land conservation or reason to protect land, you know? So, I guess there’s like the direct experience but there’s also, like, the tie to the larger concept, whenever I think of the desert tortoise I think of them as a poster child or an icon in that way.”

Other reasons for the tortoise evolving into a symbol of desert conservation included a more vague appreciation for the tortoise that has inspired people to care for the desert in a way they might not have otherwise, as conveyed by an employee of the NPS:

"So, first of all ... tortoises do wake up something in people—pictures of tortoises, and videos of them, wake up something in people that doesn't wake up when they just look at pictures of sunsets or Joshua Trees or something. You know, there's something else there. Um, and so, when you're trying to help people feel a vibration in response to the desert, you know, pictures and videos help."

Again, the decision to use tortoises to attract people to desert conservation is implied and discussed in relation to their overall appeal. This "other" appeal of the tortoise will be explained in part through other themes contained in this thesis, including the Source of Magic and the Sentinel of the Landscape themes. The tortoise is also acknowledged as being a historically significant piece of the landscape, according to a professor at Copper Mountain College:

"It's in the *local lore*, the tortoise. And for it to disappear entirely, we would lose a piece of history" [emphasis added].

As a result of using the desert tortoise as a tool (chess piece) in conservation, it becomes a symbol of a time and place (community zeitgeist). The Chess Piece and Community Zeitgeist themes together convey that politics and cultural identity play a role in the selection of the desert tortoise as an icon. In the following chapter, I will explain how the ecological role and the biology of the tortoise also contribute to its iconicity. I will also explain how data suggest individual experience and attachment contribute to its representation as an icon.

CHAPTER 4: THE SENTINEL AND THE MAGICIAN

This chapter will explore the overlapping themes “Sentinel of the Landscape” and “Source of Magic.” These themes investigate the tortoise’s appeal as it is related to the tortoise’s ability to survive as well as its correlation to desert identity and the idea of authenticity in experiencing the landscape. Specifically, Sentinel of the Landscape analyzes admiration for tortoise adaptations and their value implications, while Source of Magic focuses more on how the species is ingrained culturally, and within the human imagination.

Sentinel of the Landscape: The Tortoise as the Ultimate Desert Survivor

“They live for an incredibly long time, you know? And so, some of the tortoises, I’ve met tortoises in Twentynine Palms that were there from before the park was ever created in 1936. Giant tortoises. So they’re sentinels of the landscape.” – Interviewee

The idea of a desert tortoise as a sentinel brings to mind imagery of the tortoise as a large, sturdy soldier, standing guard over his or her habitat. This theme explores how the desert tortoise might act as, or be perceived as, an entity whose physical existence suggests a level of protection for its landscape. As demonstrated by both literature and anecdotal data, the desert tortoise lives a long, slow life, and has been a continuous part of the physical desert landscape for millennia. These grounding features of the tortoise have inspired this theme.

The California Desert's people, wildlife, geography, and geology all work together to form a sense of identity and place. The tortoise represents a rugged hardiness that seems invincible; surely another animal could take its place as a representative, but it wouldn't be the same. The idea of the tortoise as a sentinel of the landscape aligns with its incredible longevity that is admired by members of the desert community. Through this theme, Sentinel of the Landscape, my findings demonstrate that it's no coincidence that the tortoise is a reflector and protector of the physical landscape as well as of desert values and culture. I also find that these physical and cultural elements of the landscape are inextricably linked.

Survival appears to be a key idea in the appreciation for this animal. People in the desert pride themselves on living in a harsh environment, and they value other life that seems to thrive in seemingly unlivable conditions. The biodiversity that perseveres in the desert southwest seems to inspire these individuals, and the idea of losing the icon of that perseverance forces desert residents to confront our own species' mortality, especially since many of the threats facing the tortoise overlap with threats facing humankind. As explained by an employee with JTNP:

"I do think there's merit in that, that people do make personal connections with other living creatures that they—here, specifically, I think—*admire*, are *astounded by*, are surprised by, because the animals here are doing things that we simply can't do. We are so reliant on electricity, and swamp coolers, and, um, controlled environments, you know? Most people take shelter in their homes during the peak heat of the day or in the cold of the winter. We have extreme wind events or extreme weather events here. I think that—I personally, and I've seen this in others—have a wonder looking at the wild world out there, and an *appreciation* for their... *adaptations, and ability to survive*... almost in an incredulous way." [emphasis added].

Interviewees expressed an affinity for the desert tortoise's longevity as well as its ability to survive in the harsh desert environment. An employee at JTNP stated, "it's [the desert] a harsh place... and the desert tortoise is tenacious and *can survive* this place. This is not a gentle place to be." The same interviewee called the desert tortoise "the old man of the desert" and "that prospector that's out there, that shouldn't be alive but *somehow is able to survive*" [emphasis added].

Highlighting its ability to endure without water, the same JTNP employee said, "the tortoise, let's face it—it's a pretty cool animal. It can live for 60 years. It can go without water for months or even years, it's truly an amazing critter." The ongoing disappearance of this species—despite its long-term, dinosaur-like existence—inevitably forces humans to consider our own survival abilities. Another participant emphasized that, "they're [desert tortoises] just *so old*, and that's amazing."

An employee at the MDLT shared the following stories about a tortoise existing in a place humans consider unlivable, citing how seeing the animals in the wild:

"The desert can be a pretty harsh place. And, um... those tortoises are really *good at surviving* in it. So just that one thing alone, is... I think about it every time I see a tortoise outside. ... We can be out there on our hikes for like, a few hours, you know, or if we go out there overnight and we have tents and coolers, and loads of water, and... this that and the other thing. But these tortoises live out there all year round and they've figured out how to make a living. *So I have a deep respect for anything that's that woven into the landscape and that widespread*" [emphasis added].

"[Tortoises are] really unpredictable, too, like as much as we like to think about tortoises as slow moving, and maybe that they like to burrow in the same places, or they're consistent in that way... also this last spring we went out to... the Chuckwalla Bench. ... [There are] some places up in the hills, like these volcanic hills, where there's basically, like, no shrub life up on the hills. They're just rocky, gravelly hills. There's maybe some annuals from the last spring's

wildflower bloom, like, every now and again... and we find this tortoise burrow basically at the top of this really steep hill. The hill's probably 100 feet higher than the surrounding landscape, and the slope's like 30%, and this tortoise has climbed all the way up to the top and burrowed straight into the hillside, into this really rocky hillside, the tortoise had to move rocks that were like the size of pool balls, you know, to build the burrow. ... She just dug it out, and there she is, like stuck back, way back in the back of the burrow. Totally unpredictable and completely illogical. ... So I love the unpredictability of them, too, you know? They're not just slow moving, they're not always where you think they should be. *They know things that we don't*, so, I take that to heart after my experiences this spring" [emphasis added].

The idea that the desert tortoise is the ultimate desert survivor is echoed in literature. One interviewee recalled "the cracked skin... and, uh... there's, I've been reading a guy named J. Smeaton Chase who wrote in the early 1900s about the desert, and one of the things he writes about is the low, compact forms of the bushes and says, you know, this is—this seems to be the shape of survival for the desert: we have it in the little, low compact bushes and we also have it in *the tortoise, who is the ultimate desert survivor*" [emphasis added]. Surviving is an indisputable component to the ability of standing guard, or as a sentinel. As such a long-lived survivor, the tortoise's presence on the landscape reaffirms the landscapes wholeness, and with the tortoise's listing under state and federal Endangered Species Acts, the presence of the tortoise also affirms a level of habitat protection.

The desert tortoise's appearance as the ultimate survivor has been appropriated by the military, especially when imagery is used rhetorically to demonstrate similarity between tanks and tortoises (Figure 9). The aesthetic of the tortoise is likened to a tank in the image, and an interviewee made a comment making the same comparison. I had the

following conversation with an interviewee regarding the allure of the tortoise's

adaptations:

Interviewee: "It's just a unique species, I mean... It's like a big tortoise that lives in the desert, you know? People are fascinated by that alone. We're used to seeing, you know, box turtles, and pond turtles, and smaller things, and then you come to the desert and you see this giant creature... and it's like, well, how does that thing even *survive* out here?"

Me: "Yeah, and they're just so, like... heavy, and their feet look like elephant feet."

Interviewee: "Oh, they're like little tanks running around."

Me: "Yeah, it's interesting seeing them compared to tanks, especially in the military context."

Interviewee: "I know, right?"

(both laugh).

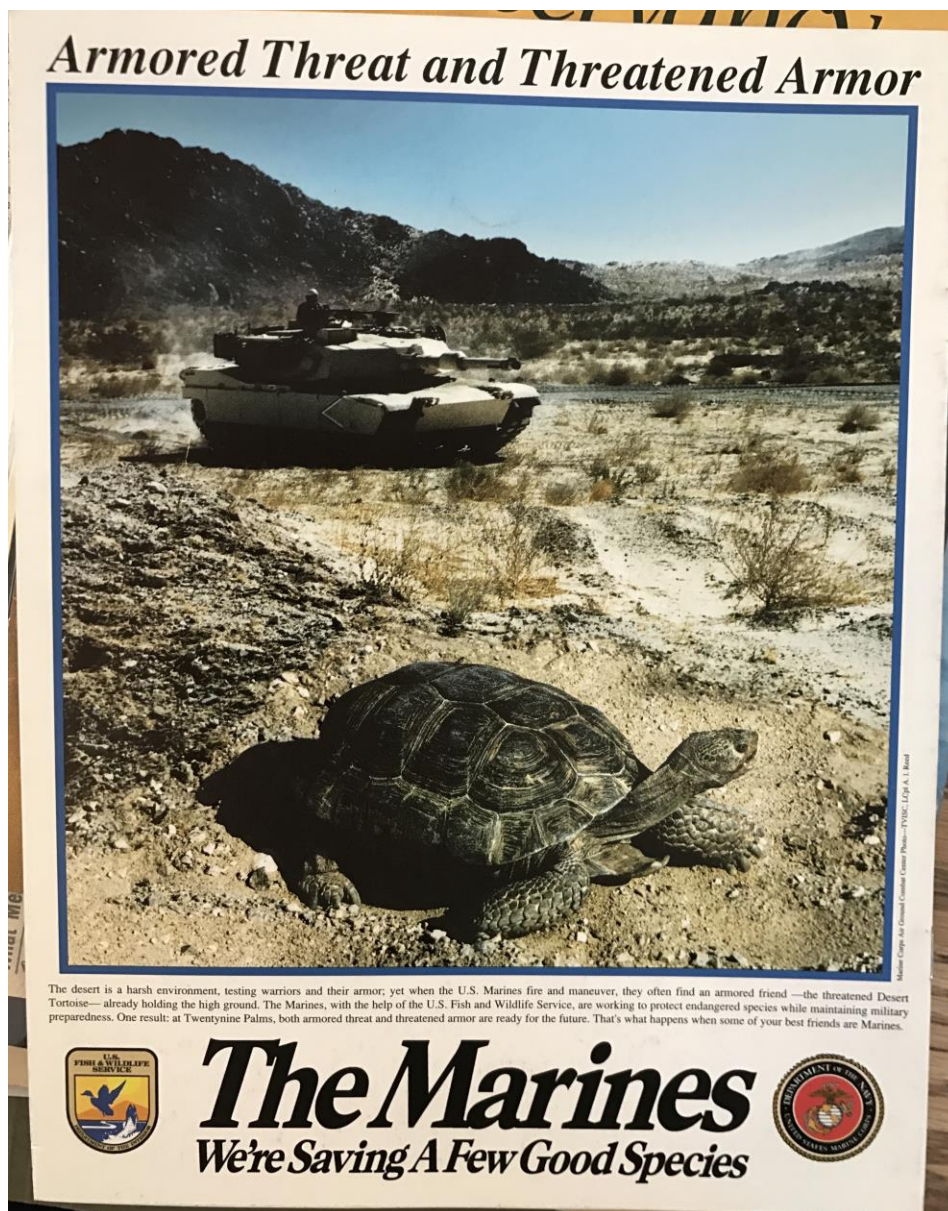


Figure 8. Tortoises displayed in the military context (Source: Twentynine Palms Historical Society)

Due to the overlapping nature of my six emergent themes, some conversations yielded quotes that include ideas fitting into a couple of themes at the same time. For

example, an attorney for the NALC touched on the tortoise being the sentinel of the landscape as well as a source of magic in the following quote:

“How can something *live that long*? Despite everything we’ve done to annihilate it too, *how can it live that long*? Um, tortoises are kind of the same... you sometimes hear people refer to them as “grandfathers,” or, you know. It’s just—they’re just such an old species, and I feel that that kind of resonates with people on a deeper level, and so that kind of uniqueness, and age, makes them an icon for the desert.”

The idea that ancient tortoises are grandfathers or grandmothers isn’t new. Human actions and tortoise life has been inextricably connected for thousands of years, starting with their significance to indigenous cultures. The topic of indigenous cultural connection to the desert tortoise was not broached much in interviews, due to the Institutional Review Board’s (IRB) constraints regarding the interviewing of tribal members coupled with personal time limitations¹. However, the topic did come up when an interviewee mentioned the Tortoise Rock Casino in Twentynine Palms and the tortoise habitat occurring on that site:

“The tortoise, of course, for the Chemehuevi Tribe has a lot of significance. They named their 2nd casino up in 29 Palms, the Tortoise Rock Casino, and on that site, there’s tortoise habitat. And so they, you know, dedicated land for tortoise habitat.”

The same interviewee described tortoises as a cultural resource:

“I think tortoises are valuable as... tortoises are something that we could characterize as a *cultural resource*. They, you know, have a significance to tribes, and that plays back into the idea of protecting the *totality of the landscape* so the

¹ The IRB requires a signed letter of consent from any tribal government that’s members would participate in this research. In an effort to avoid rushing to build rapport with tribal leaders and to avoid the colonial legacy of tokenism, this research does not include participants with tribal membership(s).

community can continue to maintain parts of its traditional lifestyle” [emphasis added].

The tortoise-human connection transcends time and even, arguably, culture. I include the indigenous connection to tortoise in this theme rather than another theme because of its longevity and the historical place of the relationship as interwoven within the landscape. Having been culturally significant to tribes for thousands of years, another interviewee suggested that they’ve also become culturally significant to the settler population just through the past century or so, mostly due to their associated conservation symbolism:

“I think, while a lot of us non-native folks in the desert would blanch at the thought of eating a tortoise anyway, you know, even if we were crawling with ‘em, um... I think that they are starting to become as culturally important to us [non-natives]. Just because of the fact that we have made them a symbol.”

Another component of the Sentinel of the Landscape theme is the idea that the desert tortoise and its landscape cannot exist without one another—they are inextricably interwoven parts of a whole, as one interviewee explained:

“Tortoises are keystone species in the ecosystem. So, their burrows are important for other species. They’re a disperser of seeds of plants. They make little highways, so if you ever see like an area with a high density of tortoises, you’ll actually see the little highways that they make through creosote flats. So they serve a lot of roles ecologically. I don’t think there’s any question that without tortoises, *the Mojave Desert and the ecosystem that it evolved with the tortoise as a keystone species...* to not have that species would irrevocably harm that particular ecosystem” [emphasis added].

The tortoise and the ecosystem are interwoven, and arguably dependent on each other for survival. The tortoise is an integral part of the ecological landscape. Another interviewee expressed that the animal has a “familiarity with the landscape that most people can’t even comprehend, much less envy.”

Put succinctly by another interview participant: “it’s such a *long-lived species*. It’s just sort of an icon of desert culture. As are other things.” A USFWS employee elaborated on this idea of the tortoise being ingrained in desert culture, saying that “it’s a culture, you know, *people have a respect for the animals and the plants that are able to persist in the desert*, and get by.” He continued, invoking how the possibility of the tortoise going extinct might serve developers but ultimately the loss of the animal would have a significant cultural impact:

“...I think that even the tortoises are sometimes contentious from a management and policy perspective because it limits what people can do in the desert. I mean, I think they’re—it’s a sad time when an iconic species like that, that’s represented the desert for, you know, the hundreds of years that people have been living here, would have disappeared. So I think that people will definitely lose something, they lose connection, they definitely lose that piece, a culture—kind of a cultural connection to the desert.”

As implied in some quotes that inspired this theme, the tortoise is also an integral part of the cultural landscape, and explicitly, to some residents, represents desert culture. Humans in the desert admire an animal that is intimately tied to its landscape, and the loss of this animal would symbolize something that humans have done wrong. The implications of this symbolism are explored further in other themes.

Again, Sentinel of the Landscape and Source of Magic have in common that they conceptualize the tortoise as being a necessary part of the desert landscape. But, as a sentinel, the tortoise is appreciated for its ecological role and adaptations that mystify people. In contrast, the Source of Magic theme will explain how the tortoise is appreciated for the deeper cultural, social, and spiritual connections it fosters.

Interlude: The Desert and the Tortoise, a Love Story

“It’s easy for people to disconnect from the desert, because like, they just think it’s hot, it’s dry, it’s scary, it’s where people bury dead bodies. There’s that whole kind of mythos about the desert. That’s unfortunate, and it makes conservation challenging. But because the desert is such an extreme place, you get species that are found here that are found nowhere else in the world.” –Interviewee

The two themes discussed in this chapter convey a portrayal of both the desert southwest and the desert tortoise as one-in-the-same. On a physical level, one emanates heat, while the other absorbs it; one digs basins, the other fills it with water. A landscape and the animals living off of it will of course have a reciprocal relationship, but the interviews I conducted demonstrate a perception of a particularly deep level of connection between the desert and the tortoise. These perceptions were even conveyed through discussion about appreciating the land, with no specific mention of the tortoise. The following quotes focus on traits associated with both tortoise and the desert, although they only explicitly mention the desert:

On slowness:

“You maybe slow your mind down enough to notice the layers of rock that are sticking out of a canyon wall.”

On toughness:

“Everything has thorns on it.”

“You can challenge yourself to survival, and you can go to a place where its 125 degrees, or you know it’s freezing cold and there’s snow on the ground and you’re not gonna see anyone.”

On open space:

“I feel deeply connected to the desert. I like being there, I feel good when I’m there, and I very much enjoy the wide open spaces...”

On quiet:

“We heard no radios, we heard no people talking. It was... the beauty, and the peace, was just incredible. No noise. The silence was rather overwhelming because you could just... you could enjoy it yourself, and not be hearing the roar of motorcycles, shooting, or anything else going on in the desert.”

“You know, I was just out at our preserve... it’s probably one of the only places in life where I can hear the sound of silence. It’s utterly quiet.”

On elusiveness:

“The uninformed person comes to the desert and they just see a barren landscape, and a place where life shouldn’t exist. And sometimes, when you think about, I’m like yeah, life is pretty—maybe life shouldn’t exist in some of these areas. But, um, you know, it’s one of the most bio-diverse places that you could possibly visit, so... when you really, truly start to understand the ways that life have adapted, and that plants and animals have adapted to just persist, it’s, it’s pretty cool. It makes it not at all a barren place...[but] a beautiful landscape.”

“And there’s always stuff that people don’t notice, sometimes because they don’t know that they should, sometimes because they just don’t care. I mean, there are millennia-old creosotes in vacant lots next to Rite Aids in La Quinta.”

The care and attachment to the landscape was also exhibited in reference to the potential loss of significant attributes of experiencing the landscape and its tortoise into the future:

“If you live in a world without a dark night sky, like if you live in a place with light pollution, if you don’t know how beautiful the night sky is, you would never miss it. Cause how could you know? Cause you don’t know until you do, right?”

“The reason I do continue working on this topic is I do want there to be places where people can go and they can see tortoises in the wild. That’s been an overriding concern.”

Conserving a landscape as a whole is important not only for ecological purposes such as biodiversity, but also for cultural ones. This idea was emphasized by an attorney for the NALC:

“Biodiversity lends to this idea of protecting cultural landscapes as a whole, and by protecting cultural sites as a whole, you create a landscape where generations can learn.”

With the desert conceptualized as a harsh environment, and the tortoise conceptualized as a rugged survivor, the two appear to occupy a similar space in the human imagination. The adaptations that residents admire and value are apparent in both the place and in the totem animal. Again—what does it mean to be destroying an animal that we admire? And, further, what does it mean to be decimating an animal that you view as the ultimate survivor? The next theme, Source of Magic, demonstrates that the tortoise is an integral part of the ecological and cultural landscape, while focusing more on the ideas of authenticity and identity.

Source of Magic: The Tortoise as an Indicator of Authentic Experience and Connection

“I just think it’s really interesting that people care that much about an animal that they may never had seen in the wild. That... used to live here in a lot greater numbers than it does, and that, it’s just—for most of us, it’s only a source of magic, and nothing else. You know, we count ourselves as really, really lucky if we get to see one, and... it’s like, it’s why we’re here. It reminds us of why we’re here.” –Interviewee

I have found in my research that desert tortoises have perpetually been a necessary component to *authentically* experiencing the desert landscape in the American Southwest. When I asked interviewees about their experiences with tortoises, in most cases, stakeholders responded with feelings that emerged from the experience(s). I found that these feelings could be divided into two types: intellectually stimulating and spiritually stimulating. Either the experience was described as fascinating, the tortoise’s

behaviors evoking curiosity; or it was spiritual, magical, and the experience was awe-inspiring. In some cases, respondents described both types of feelings. Nearly half (n=5) of study participants used the word “spirit” or “spiritual” in describing experiences within the desert ecosystem and/or with the desert tortoise, and some used the word multiple times throughout the interview. An additional three participants used the words “magic” or “magical” in conveying feelings about encountering desert wildlife, including the tortoise. This theme focuses on these ideas along with data reflecting a perception of authenticity surrounding the desert tortoise.

One participant conveyed how experiencing a “natural” landscape in general, along with its wildlife, offers a kind of authentic experience:

“You know, having that simple connection where we slow down and we’re like paying attention to the landscape around us... is really good for us, it’s really good for our minds. ... Those are really *authentic experiences* too. Because they’re a person directly interacting with something in the natural world that’s not—it’s not built to be fascinating to you, you know? Like, uh, your iPhone app is built to be fascinating to you as a person... Or an advertisement, or a car... like, all those things are built to be of interest to human beings some how or another. But when you’re interested in a scorpion, the scorpion is just a scorpion, it just is what it is. Or the tortoise *just is what it is*. So, um, we’re reflecting something that’s real, *it’s authentic*, it’s—nobody has made it that way just so it’s interesting to you, you know? You’re just naturally interested in it... So that’s what I mean by saying that the desert is a place of connection for human beings. And I think those experiences remind us of who we are at our root, you know? We didn’t always have iPhones in our pockets. And so I feel like they’re transformational for that reason. They remind us of how to just be—how to just be people. Kind of what our root nature is” [emphasis added].

The ancient existence of the tortoise, coupled with its current rarity, makes it a particularly compelling animal to come across in the wild. I have spoken with individuals—including interviewees whom I met for the purposes of this thesis—that

have lived in or frequented the California Desert for years and never once have seen a wild desert tortoise. Others are awestruck, amazed, and fascinated when they finally encounter a wild tortoise, particularly outside of their work. The tortoise is then conceptualized as being an integral part of not just a desert experience—but of an authentic desert experience.

As highlighted in earlier sections, desert tortoise populations have been dramatically decreasing in density for decades. For residents who have lived or worked in the desert southwest for a lifetime, the change is jarring. For residents who have only within the past decade or so begun living or working in the desert southwest, tortoises are seemingly inevitably invisible and elusive.

Considering the tortoise's current disappearance, one story told to me by a USFWS employee was particularly shocking. The desert tortoise's existence as part of the authentic desert landscape, although obvious through time, has also changed significantly, from being everywhere, to being nearly invisible. The interviewee was describing a photograph from memory:

“I always think of this picture—and I wish I had it... it was like, a gas station back in like the 50s or something, and it was like an old pickup truck, and it was—there was a sign on the gas pump, that said, like, ‘free tortoise with a tank of gas,’ or something, and in the back of this truck there's just a pile of tortoises, there's probably like hundreds of tortoises, they're stacked, just piled up in the back of the truck. So I guess you'd like, pull up and fill up your tank and grab a tortoise and be on your way.”

The same interview participant stated that the tortoise is “certainly an iconic species, especially for people who spent a long time in the desert who can recall when *tortoises were like cockroaches coming out of the woodwork*, I mean, which is a sad—

kind of sad to think about the reality now, you have to actually go out and look for a tortoise instead of having just piles of tortoises in different parts of the desert. They've definitely declined in number, but *they used to be everywhere*, so... yeah, they're certainly an iconic species. And just, so perfectly adapted to living in the conditions here."

A Morongo Basin resident who works with the Morongo Basin Conservation Association (MBCA) recalled that, "nobody goes, 'what's that?' It's the desert tortoise. And everybody knows that it's a problem. That it's—not only endangered, but we keep hearing that the populations, whatever they are, are going down."

An employee at JTNP had a slightly different take on the connection to tortoise, suggesting that their accessibility is actually what allows people to be drawn to them:

"I think the tortoise is an animal that people can connect with here because they can actually see 'em. If you're out walking—obviously you need to actually be outside to do that, and actually, you know, exploring the area, but—I think it's an animal I've seen people here connect with, and I kind of think that some of that has to do with the fact that *people are having personal experiences, seeing them, etcetera*" [emphasis added].

An employee for the NPS referenced an ideology about natural resources that can be applied to tortoises, stating, "so... I have never seen a desert tortoise in the wild. And... I may have seen one in a zoo, so, mostly my experience... there's a—a body of thought, or maybe it's even a legal concept about the park system—that Americans benefit from knowing that the National Parks exist, even those Americans who cannot visit them. And, so, I feel like I'm very much in the realm of *'I benefit from knowing that desert tortoise exist, even though I cannot see them'*" [emphasis added]. This ideology

highlights how the existence of wild desert tortoises is perceived as having inherent value.

The idea of a tortoise-less desert being “less than it was” (with the tortoise) was evoked in several interviews. When asked about the impacts of tortoise extinction on the local Morongo Basin community, a professor said frankly, that, “it [the desert] would be less than it was [if the tortoise went extinct].” The professor said that losing the tortoise “would be a loss for humankind in a lot of ways: genetically, *spiritually*, biologically, ecologically. So, for those reasons, that species has been chosen as something to protect, because it is an indicator. If we can protect it, we’re likely protecting a host of many species.” This idea ties back to the literature, suggesting that the desert tortoise functions not only as an indicator species, but also as an umbrella species. Further, the idea of a benefit to the human spirit is suggested.

One interviewee who works for the NPCA said that the extinction of the desert tortoise would lead to the California Desert being “poorer as a community” without the “opportunity to watch a tortoise in the field.” The participant claimed that not only do tortoises have ecological value, but that “people love tortoises, and like, *the special experience of being able to be in the field and see one*. For a child, to come across a tortoise, right? To be out hiking and to find one and to watch it and to have that fascination, right? For us to learn about their adaptations to the desert, you know, we would lose all of those things [if the tortoise went extinct].”

The same participant evoked the idea of authenticity:

“It [extinction] would fundamentally change people’s experience. Like, if you went to the Serengeti and you didn’t see a lion. What would that be like? *Is it still the Serengeti?* Is California the same as it was, when—now that it doesn’t have Grizzly Bears anymore?”

As did another participant:

“I think that... people would be... a general feeling of loss in the general public. Because, it’s an icon that would no longer be there. And, is the desert quite the same? It’s like the desert without the Joshua Tree. *Is Joshua Tree Joshua Tree if all those were gone? It’s not. Same with tortoises.* You know, what makes the desert unique? Its plants, I guess its arid [aridity]—its hot weather, but you can get that in a lot of places... and its just landscape, and its animals. And if they’re—those animals, tortoises in particular, were gone, that changes things for people who grew up locally. I also think it has greater economic impacts, I think it would have tourism impacts the same way, um, you know, people come to visit the desert, especially now, especially in recent years, so many people from urban areas are coming to view the desert, and *that icon is part of it, that experience is part of it*” [emphasis added].

One resident of the Morongo Basin who works with the Morongo Basin

Conservation Association (MBCA) simply said, “I think they’re just like, our animal.”

The interviewee continued, “if I saw one, and I’ve seen about three around my property, I mean, I’m gasping.” The same interviewee highlighted the experience of not seeing tortoises as an illuminating experience in itself:

“I think one of the experiences that I’ve had is no experience, in that, I’m well aware that desert tortoises used to be very common. Near my property, which is pretty much out in the open, I have found one baby shell and I’ve seen one very old tortoise, but *the fact that I don’t see very many tortoises is compelling to me* because I know that that is a historical drop.”

As revealed through these interviews, experiencing a tortoise in the wild can have a significant impact on an individual. One interview participant recalled the exact date of their first encounter with a wild tortoise:

“I met my first tortoise in 2008. I remember the exact tortoise and the exact date. March 22nd, 2008. That tortoise was a young female and she had green juices all over her face from eating cactus flowers, and... she was beautiful.”

Another interviewee recalled that, while on an intellectual level we might be able to recognize the tortoise as important, the significance of the species takes on a whole new meaning when we encounter them in the wild:

“I knew, I guess, intellectually that it was important. But then when you run into ‘em, and you’re dealing with ‘em, and everyone comes away so excited. It’s such a positive thing.”

When asked about the role of tortoises in local politics and also its potential extinction, an employee with MDLT stated, “if we lost tortoises, we’d lose that window in the world, you know? That window into perceiving something that is an icon of the pristine landscape... and I would hope that we would all feel really terrible, because it’s something that’s within our grasp to change right now. But it’s not going in the right direction.” The participant emphasized the species’ rarity, noting that they have “talked to people here in the Morongo Basin, though, that, um, *some people here have never ever seen a tortoise in their whole life. Or maybe some of the old-timers say, ‘you know, there used to be so many tortoises that there was a tortoise race in downtown Joshua Tree.’*” The interviewee continued, “so, there was a—*there’s a memory in peoples mind, that something has changed from the way things used to be.* And some people, who have never seen tortoises out here, maybe never learned the way that it used to be, so they’re not as aware that something has changed” [emphasis added]. The participant’s concern about the tortoise being an integral part of a “pristine landscape” echoes the idea of authenticity.

The interviewee described people encountering tortoises on their property in the Morongo Basin as “lucky,” and continued that, “once people run across them, they do have that sense of wonderment.” The participant suggested that “maybe it’s a *reminder of the way things used to be*, I think that tortoises can remind us that the world is changing through land use decisions from human beings and it helps remind people that they have a responsibility to make a change responsibly. You can’t run into a tortoise in the wild and, if you’re a conscious person, not think that those animals have a right to be here, you know, that *they should persist*, and that human beings are having a very negative impact on them in a huge number of ways.” This interviewee’s testimony highlights the tortoise’s ability to evoke wonder, and to be emotionally affected by coming across a wild tortoise.

As observed from the Sentinel of the Landscape theme, the desert tortoise is interwoven with the ecological and, consequently, cultural desert landscape. One aspect of this entanglement involves a sense of identity that is inclusive of tortoise conservation and care. As expressed by an employee at JTNP:

“From what I have seen of the people that live in the three towns that we have up here [in the Morongo Basin], *tortoises are a big part of their identity*. Especially with the, um, the more conservation minded facets of the community. You know, kids grow up here and they learn about tortoises in school. And people see tortoises in their backyards. They see them on public lands. *So I do think that tortoises are part of the cultural identity of this area*” [emphasis added].

The idea of both (at community and individual scales) care and attachment are also apparent in this (Source of Magic) theme. As tortoises become an important part of

cultural identity, their significance becomes internalized and part of one's own identity, expressed through attachment to the species. As a local professor said:

"I've become, unfortunately, *attached* to them [tortoises at the preserve], as a researcher should not do. Cause I—some died yesterday—or, I found their carcasses yesterday—and I found that I was, unexpectedly, very upset by that. I think because I've been following them for 10-11 years. And even though they don't have personalities, per say—they're not human beings—it's difficult to see them die."

The same professor, who manages the desert tortoise preserve on the Copper Mountain College campus in Joshua Tree, recalled how he felt at the onset of his work managing the preserve:

"I started off, they said, you're managing this preserve—these tortoises on campus—and I thought, oh my gosh, I don't have tenure, what if I take this job, and all the tortoises die? Am I gonna get kicked out of here? *Is the community gonna crucify me?* I thought, well, probably not. I've done my best to manage it well and preserve the tortoises" [emphasis added].

Along with the idea of desert tortoises as necessary in an authentic desert experience, the idea of wildness and freedom as an indicator of authentic experience also emerged in this theme, particularly when one participant discussed the captive tortoise she had as a child:

"Well, my father found the tortoise. And it was in danger of being crushed, it was at a school construction site, it was when we moved to China Lake when I was very small, and we were living on the edge of the desert and there was a lot of sand blowing because of all the construction and the disturbance of the soils. And so he brought home this animal that he had rescued, and um, he found some others, too, that were in a similar situation, and we had them in a pen in the backyard. *And I could remember thinking that they really needed to be free.* And I've always felt that way. However, I know that um, it's not advisable to set them free because of all the issues facing them."

Conversely, in recalling how many people have captive or pet desert tortoises, a local who works with the MBCA noted that, "once you make friends with an animal, a

wild animal, that puts you in their camp,” suggesting that as people acquaint themselves with a tortoise, they are more likely to support conservation of the other existing wild ones.

The Source of Magic theme highlights how encountering and experiencing a desert tortoise in its freedom and wildness evoke feelings of care, attachment, and connection. The Sentinel of the Landscape theme focused on how the tortoise’s physical and ecological adaptations evoke cultural connection and draw people towards desert tortoise conservation. Considering the interconnected nature of the desert tortoise and desert cultural and individual identity, declines in tortoise populations suggest a fundamental shift in the desert landscape—ecologically, culturally, politically, and socially. This suggestion of a shift leads into my next chapter, which discusses the tortoise as the proverbial canary in the coalmine and tortoise conservation as a quixotic undertaking.

CHAPTER 5: THE QUIXOTIC CANARY

This chapter explores the themes “Canary in the Coalmine” and “Tilting at Windmills.” The Canary in the Coalmine theme examines how the tortoise is not only an ecological indicator species—as the literature demonstrates—but it is also an indicator of socio-cultural and socio-political changes in the desert. Tilting at Windmills investigates how the plight of desert tortoise conservation is conceptualized as an idealistic effort nearly impossible to achieve, and includes a discussion of grief and responsibility.

The Canary in the Coalmine: The Tortoise as an Indicator of Change

The canary in the coalmine is a story that has been told for decades, ever since the birds were used to detect dangerous levels of carbon monoxide in mines that were undetectable to humans. Since canaries are more sensitive to the deadly gas than humans, the animals becoming ill or dying would warn miners to evacuate a dangerous situation.

The function of the desert tortoise as an ecological indicator species is well known and generally uncontested by scientists, as demonstrated in earlier chapters of this thesis. However, my research illuminates that the desert tortoise is also a social, political, and cultural indicator. This theme investigates each of these indicator roles of the species.

First, the phrase “canary in the coalmine” came up a couple of times in the context of the tortoise being an ecological indicator species. Each of the following examples came from different individuals:

“They’re kind of like a *canary in the coalmine*. They indicate, you know, if you’ve got desert tortoises in your ecosystem, you’ve probably got a healthy ecosystem. If they’re not there, there’s something missing” [emphasis added].

“Tortoise conservation, I believe, is important biologically, because, by protecting the tortoise we’re protecting the entire ecosystem. It’s such an obvious indicator—or, let’s say, easily identified indicator of ecosystem health. It’s the *canary in the coalmine*” [emphasis added].

The phenomenon of the canary narrative being invoked in multiple interviews suggests that the desert conservation community values the tortoise for its role as an indicator of environmental disturbance. Three (n=3) participants explicitly recalled the canary narrative, and three (n=3) additional participants, while they didn’t say word “canary,” chose to discuss the tortoise’s indicator role.

One interviewee recalled that, perhaps, the tortoise's sensitivity to disturbance is what put it above other potential flagship species in the desert southwest (the bighorn sheep, for example) and made it such a conservation icon. When we can assert that as the tortoise goes, so do other species, we can provide a strong rationale for protecting it.

Other discussions of the tortoise as an indicator or umbrella species did not explicitly involve the term “canary,” but evoked the same ideas that the proverb reflects:

“So, I think, I have a recognition of like—desert tortoise habitat means pristine, well-functioning desert, and I think that's why they've become iconic of that kind of landscape. Because they don't exist—or they don't last—they don't exist well on the fringe. You know? They just don't. They don't make it. Our properties here in the Morongo Basin are pretty heavily impacted by weeds, by vehicles, by dumping, and there's still tortoises, like hanging on... but we don't see many [tortoise] juveniles like right now by the highway, you know?”

“We [biologists] said that if you protect the tortoise... you're going to protect a lot of the rare and endangered plant species, and it—the tortoise can't tolerate much in terms of disturbance. Surface disturbance, disturbance of the shrubs and the wildflowers and so on, and that certainly—as our knowledge has grown—that is certainly the case, that has come to be the case.”

“And, you know, one thing we look at is—with tortoise habitat—as long as the tortoise is listed, and being protected, and conservation is coming out of it, you know, that's kind of like a proxy conservation mechanism for a lot of other species in the desert. By protecting tortoise habitat you're also protecting the habitat of any vast number of lizards, and birds, and whatever it might be.”

The tortoise's role as an ecological “canary,” or indicator, coupled with the species flagship status, makes their declining population even more striking. Some interview participants suggested that our inability to protect such a beloved, thoroughly researched animal, says something about not only the condition of the ecosystem but also about the condition of humanity.

The desert tortoise's role as a social, political, and cultural indicator and surrogate species was implied at times with explicit reference to the canary in the coalmine narrative. The President of the Desert Tortoise Preserve Committee stated the following:

“I view the tortoise very much like the canary—the proverbial canary in the mine. I think the tortoise is telling us something by disappearing here. It's telling us that we are doing things to this planet that may be unsustainable, and, um, we may be heading down a cliff that, that—we will find it very challenging if not impossible to ever come back from.”

“Again, it's like the canary—I go back to the canary. If we allow the tortoise to go extinct in the California Deserts, then it's just a matter of time before we will follow.” [emphasis added].

Other times, it was perhaps more implicit, with an interviewee saying desert tortoises are “a marker for how much we change the world, you know? And half the time we don't even know it.” This idea of change is particularly important as the desert ecosystem—specifically my study area, the Morongo Basin—is forced to cope with the influx of amenity migration and spike in tourism discussed previously. One participant stated, “now with so many people from the Los Angeles area coming to the desert, it's important to inform them that certain landscapes may have a carrying capacity and can't handle 60,000 visitors in a weekend.” The interviewee paused, and added, “so, maybe [visitors should] go to another area.”

An employee with NPCA highlighted how the loss of tortoises from the landscape has implications beyond its physical existence, suggesting, “the biggest impact [of extinction] would almost certainly be *symbolic*,” considering that the tortoise is “low maintenance,” “long-lived,” and “intimately tied in with their landscapes.” This is in line

with the premise of this theme: that the tortoise serves as more than just an *ecological* indicator.

As displayed by these interviews, the tortoise symbolizes something else that we're losing. Like the canary in the coalmine, the desert tortoise conveys messages to conservationists about the health of the ecosystem that it occupies, with their absence or death warning those nearby that the current state of the environment could be unhealthy. The next theme I will discuss—Tilting at Windmills—also looks at loss, but rather than looking at the tortoise as an indicator, *Tilting at Windmills* examines the ways stakeholders narrate the loss, and broadens the conversation to encompass more discussion of humanity, the anthropocene, and grief.

Tilting at Windmills: The Tortoise as a Quixotic Pursuit

“It’s slated for extinction as we all are, as most species are in the long run, beyond our lifetimes... but we can’t let that deter us in trying. And there’s value in just trying, too. It might be like Don Quixote tilting at windmills. But, there’s some... there’s a *heroic* aspect to that, and it just occurred to me. *Tilting at windmills, I wonder if that’s me...* or, people who are protecting species that are slated to go extinct. I wonder if there is a—some kind of psychological aspect to that.” – Interviewee

Tilting at Windmills is a story about the fictional character Don Quixote who attempts to fight windmills, mistaking them for giants. The phrase is often used to describe someone fervently chasing after something despite reality’s efforts to discourage the endeavor. Don Quixote’s adventures, told by author Miguel de Cervantes in 1615

under the full title *The Ingenious Nobleman Sir Quixote of La Mancha*, inspired a new adjective in the English language: *quixotic*, or foolishly idealistic.

Confronted by the harsh realities of climate change and environmental degradation, many ecologists find themselves navigating a delicate emotional balance between blatantly pessimistic and foolishly quixotic. The impact of extinction on socio-ecological systems has not yet been explored in-depth or longitudinally by social scientists. This theme explores how community stakeholders are conceptualizing the potential loss of an iconic species.

The loss of tortoises from the landscape, particularly in the Morongo Basin where most of my research took place, is an obvious concern for residents working in conservation. The implications of their disappearance include a lack of awareness among future residents and visitors, as an employee for MDLT pointed out, “the fewer tortoises that there are, the less people remember that they’re around, you know?”

The story of Don Quixote Tilting at Windmills is a fantastical one in which the enemies cannot actually be beaten. In the case of the desert tortoise and the battle against further population decline and extinction, there are perhaps pragmatic ways to “win,” or to mitigate threats to tortoises and other wildlife. However, as conveyed in the interviews I carried out, at times the plight for the tortoise appears to be a losing battle. An employee at USGS explained that, “there was a 50% decline between 2004 and 2014... in adult tortoises. And that’s range-wide. If you take, you know, one area versus another and recover units, there are 5 recover units, 4 out of 5 recover units have declines, major declines, of adults, of breeding adults. They’re not measuring the juveniles. But what it

also indicates is *that the juveniles are not thriving because they're not being incorporated into the adult population at the rate of the mortality that's occurring for adults*"

[emphasis added].

The same USGS employee explained that their concern is not so much about extinction, and more so about population viability:

"I think that the greater question is not—if you're defining extinction as no more wild tortoises—the greater concern is: at what point are the populations no longer viable? That's the key point. Right now we have very low densities of adults, 2, 3, or 5 per square kilometer. And if you have that, and you assume that 50% are females, you don't have very many females laying eggs. And it's certainly a question of which of the populations are on the edge of viability now or no longer viable. *So I think that there will be individual animals alive for a long time. But whether there are viable populations—that's another matter.* There needs to be a major effort to take down mortality. And solve the sources, the many sources of mortality. *And when a population gets to be very low, then it doesn't take much to wipe it out, locally.*"

During my interview with a Morongo Basin local who works with the MBCA, the interviewee said that local extinction in the Morongo Basin "would be *devastating* and the *anger would be really deep*. 'Cause it didn't have to happen" [emphasis added]. In a follow-up question, I asked, "Do you think that's the path we're going down right now, though?" She responded:

"Could be. Um, I—when I look at how few tortoise there are out here now, and then I talk to people, you know, where I live who *used to see them constantly*, that may be. I think certainly we know one of the problems is off-road vehicles, and they've become way more common. And, um, many of them, especially—I, I talk to people out in Copper Mountain Mesa where *there's quite a few tortoise, and they're seeing less and less, and they're seeing them damaged*" [emphasis added].

These data demonstrate how anecdotal data and story about tortoise encounters and mortality are affecting resident's perception of the problem. This leads into the idea

of responsibility among residents, and also a broader concept of humankind's responsibility to be stewards of the planet. The President of the Desert Tortoise Preserve Committee said that desert tortoise conservation should represent "the fact that we... that we're intelligent, feeling, concerned... and that... we have the capability, and we know we have the capability, of making the planet a better place for future generations, whether those generations be tortoises or people who love tortoises." The same interviewee recalled that tortoises have "been here longer than we [humans] were here, and um, if they [people] understand anything about the size of what's going on, they know that we single handedly are the ones responsible for wiping them out," highlighting a concern for human responsibility and stewardship, and also an emerging discussion of ethics.

When I asked my interviewees about the possibility of tortoise extinction, there were three common responses: resistance or responsibility, loss, and grief. The community wouldn't let that happen—they wouldn't stand for it, this employee for JTNP stated explicitly:

"I don't think this community [the Morongo Basin community] would ever allow the tortoise to become extinct. I think there are so many advocates, because it's a beloved animal—that, they would fight for the tortoise. There are certain things like the upper respiratory disease that we really have no control over, um, but *I don't think it will ever disappear because people won't stand for it*" [emphasis added].

The interviewee continues by constructing the tortoise as an indicator of "something wrong," consistent with and building on the previous theme, Canary in the

Coalmine. The participant concluded the thought with a broader comment about what these changes suggest about humanity:

“If it did disappear, I think it would be an amazing symbol to all of us that there’s something wrong. This, this animal which has survived for millions of years—pretty much in the same state that it’s in right now—if we’re able to extinguish its life in less than a century...[that would be a] *pretty sad statement about humanity*” [emphasis added].

When asked about the possible impacts of tortoise extinction, an employee at the MDLT expressed feelings of grief and responsibility:

“It would just be sad, it would just be sad if that happened in our lifetime or ever. Because we can be almost certain that we are responsible for having done that. I mean, there’s certain things we’ll never know right, 100%, like, why certain animals went extinct. Maybe we know ones like the dodo bird that are more recent in our history, or the passenger pigeon. But I think that our modern, like, the modern mind is that—we’d know about such a thing. You know, human beings should be able to avoid such a thing, like, wiping out such an iconic animal. And we have the power to help them not go extinct. I think the assumption is that, you know, there’s so much being done on behalf of the desert tortoise that they shouldn’t go extinct. But there’s so much being done still, that impacts them negatively, that we need to get a handle on.”

The same interviewee also expressed a feeling of loss, describing how extinct species end up existing only in narrative and signifying the necessity of narrative research into endangered wildlife:

“I think that we would—I think that we’d forget inside of a generation or two, and it would just become another story... like the passenger pigeon, right? Like, we have a story about that, but I don’t know what that was. It’s just kind of an idea, of being like, *‘huh? Passenger pigeons, huh? That sounds interesting.’* So, I do think though that in losing the tortoise that we would lose some of the things that it brings to us.”

When asked what the loss of the tortoise would mean for desert culture, a NPCA employee said, "I think, culturally, to lose one of the most iconic species, for us all to have fought for more than 50 years to protect this species and to come up short... *would*

be a tremendous blow.” The interviewee went on to highlight human responsibility in tortoise disappearance:

“That [tortoise extinction] could happen for any number of reasons: that we allowed too much development, that we didn’t spend enough time and energy fighting using the right tactics to protect the tortoise, that there were bigger threats that we weren’t addressing. And some of it is more global, right? Like, if because of climate change, the Mojave Desert experiences a 10-year drought, we’re gonna lose a lot of stuff.”

The President of the Desert Tortoise Preserve Committee said of tortoise extinction, that, “I think people would be very depressed. I think it would affect the mood.” He also called on the point of responsibility, saying, “I think the things that we, humans... we can be more responsible. It’s that simple.” Another participant posited that, “the bigger role [of the tortoise in politics] is as a reminder of our own responsibility, like a reflection of how things were, a reflection of the natural world that’s still intact.” An employee with JTNP echoed this sentiment, stating that the protection of biodiversity in the California Desert “means a lot of things. It means the responsibility, first and foremost, of understanding, which is a challenge.” An employee with the USGS expressed that “people who are familiar with the tortoise” would be “deeply saddened” by their extinction. The USGS employee added that it’d be a serious loss for conservationists as well as for nonhuman species who utilize tortoise burrows.

An employee with the MDLT also reflected on the emotion of sadness and emphasized loss:

“The desert would—it would be a much sadder place without tortoises out there, it would be less interesting, and I imagine there would be a lot of people that have worked on conservation for a long time that would be forever heartbroken about—about losing an animal like that.”

In the same vein as grief, sadness, and heartbreak, the possibility of mourning, hurting, and devastation was expressed:

“But I think, culturally it would be... the desert would mourn the loss of the tortoise, right?”

“I think that loss would hurt people for a while, I would think.”

“Well, uh... (sigh). It’s hard to say what kind of direct impacts there [of extinction] would be. There are a lot of indirect impacts. First off, people’s emotional health and mental health would take a hit, because it would be a sad thing to lose our totem.”

“Oh, um... wow, I... you know, among people I hang out with, ‘cause I’m a biologist and, you know, have conservation activism in my background, so among people I hang out with regularly... that [extinction of the tortoise] would just be such a devastating, unthinkable event. Um, I actually had never even imagined it before you asked that question. Because...it—yeah, that kinda gets so... that’s unimaginable. But, I need to imagine it.”

“Uh, I think it would be devastating. I think that these [Morongo Basin] communities have made personal connections with the tortoise.”

The idea of the tortoise as the canary in the coalmine implicitly emerged throughout this theme, but in a way that suggests the warning would be ignored:

“But extinction in the wild... I would like to say it would be a big wake up call to people who live down here that something was very, very wrong, but I’m not sure that it would. Because we’ve had other species go extinct and we usually shrug and go on. So, um, it feels like—it seems to me that among the general populace here, it would be, you know, just one more in a long list of things we’ve lost. So, resignation. I think it’d just be resignation.”

Finally, implications for communities who have co-evolved with the tortoise, meaning local tribal communities, would likely feel a particular sense of grief, as noted by an attorney for the NALC:

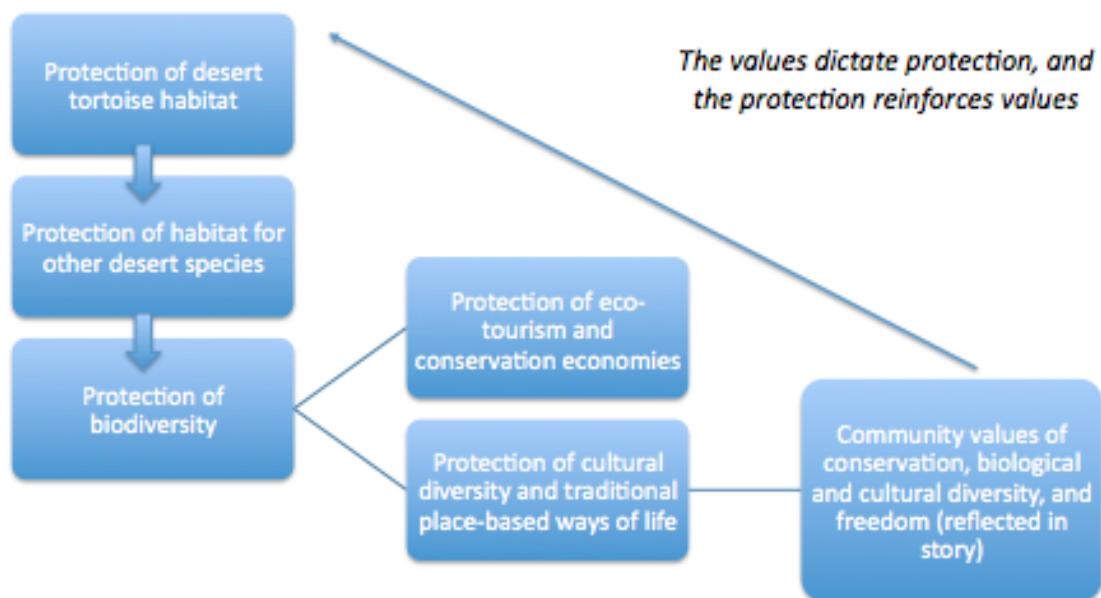
“I also think that there would be impacts that I probably couldn’t describe for the community that has been around tortoises the longest, for tribal communities.

Because the tortoise has a deeper value, because it—the tortoise has a role in tribal cosmology, in tribal history, in tribal storytelling, in song, all of those things that make their world and understanding unique... and for some—some animal that's part of that to be gone, I think would be a huge feeling of loss, particularly since there are so many things that have already changed in that world. There were so many things that were lost. There were songs that were lost. There were, you know—I'm sure we're already familiar with the policies that were in place that—that unfortunately fostered a lot of that loss, but, um, it would just be another—another thing. But, you know, really a brother, or sister, or family member, another person that would be lost to them. And that's a feeling that I don't know how to describe, but to me, that would be detrimental to those [indigenous] communities.”

The cultural implications of tortoise disappearance explained above are significant, and the existing uncertainty about tortoise viability into the future reveal a narrative of both individual and community heartache. Pragmatism and idealism appear to be locked in an ideological battle for conservationists attempting to address the radical decline of tortoise populations. Since the desert tortoise acts as a mechanism for land protection and conversation, if the desert tortoise went extinct, another mechanism for conservation would need to be developed or delegated. In particular, the desert tortoise's protected status not only reinforces its status as an icon, but also serves as a vehicle through which other threatened desert life is preserved. The values that this preservation perpetuates—biodiversity, cultural diversity, freedom/wildness, and conservation/eco-tourism economies—also tie back to reinforcing protection of threatened wildlife like the desert tortoise (Figure 10). The figure below demonstrates how tortoise conservation reflects desert values and how the two are reciprocal in their relationship. As Figure 10 shows, by protecting the desert tortoise—since it acts as an umbrella species—we protect biodiversity, and through that biodiversity protection, the California Desert community is

able to maintain a thriving eco-tourism and conservation economy. As I mentioned previously, tourism and the economy emerged as a topic in more than one-third of the interviews I conducted.

The protection of biodiversity also allows for place-based ways of life and the cultural significance of the tortoise to continue persisting for indigenous/tribal groups. Biodiversity and the freedom to live a life of your choosing are connected to the ideas of wildness that are valued by residents of the Desert Southwest.



Kohn, 2018

Figure 9. Values driving conservation

The final section of this thesis will delve deeper into a discussion of place attachment and value reinforcement, and also examines potential implications of my research. In engaging with participants for this research, I have reflected on my own

tortoise stories and motivations towards conservation of desert landscapes. The specific values that tortoise reflect in narrative, their connection to appreciation of the desert ecosystem and mythos, as well as how my six emergent themes fit into the tortoise's role as a surrogate or flagship species, are addressed in my reflection.

REFLECTIONS AND IMPLICATIONS

The tortoise's ecology and biology overlap with and speak to its socio-political role in the California Desert community. Their longevity, tough shell, and cracked skin, as well as the slow pace of living and the necessity of brumation, evoke values of desert residents. Reptiles need the sun, and perhaps California Desert residents do, too. Perhaps that's why the community has chosen a rugged reptilian representative for the region rather than a cute, fluffy mammalian one (as most flagship species tend to be larger, charismatic mammals).

In reflecting on my results, a conversation about human attachment to place and particular species that inhabit that place arises. Along with asking my interviewees about their thoughts surrounding the desert tortoise as an iconic species, I engaged in a discussion about place-attachment with them. In many ways, the motivations for attachment to the desert overlapped with motivations for attachment to the desert tortoise.

The place and the animal are conceptualized in similar ways:

- As enduring, continuous, and perseverant through time.
- As enchanting.
- As "hardy," or tough.
- As evoking caution, patience, and fortitude.
- As quiet.
- As utilizing open space.
- As sensitive to disturbance.
- As slow-paced.
- As embodying a nature of elusiveness.
- As authentic.

These findings demonstrate that flagship species should be chosen based on not only their role in the ecosystem, but upon their role in the human imagination. Further, residents having an affinity for a particular species, and millions of conservation dollars going towards that species, likely has more to do with the role that species plays on the stage of human politics, society, and culture, than the role that species plays in its respective ecosystem. Although single-species management and flagship conservation has been criticized for its lack of consideration of the whole, it appears to be a more nuanced phenomenon than people simply picking favorites, or even species-value ranking. For example, the reasons that people have for valuing the desert parallel their reasons for valuing the desert tortoise (slowness, toughness, open space, quiet, and elusiveness). This is in line with previous literature exploring how community interest in flagship species has positive effects on the animal's ability to be a successful conservation surrogate (Bowen-Jones & Entwistle, 2002; Root-Bernstein & Armesto, 2013).

The California Desert Protection Act of 1994 is a testament to the persistence of the California Desert conservation community. To a degree, the Act symbolizes how difficult it has been, historically, to forward an idea of the desert as being a valuable ecosystem worthy of preservation in a society that does not value aridity and defines desert as (falsely) synonymous with lifelessness and wastelands. The results of my research show how the tortoise fulfills this role arguably better than any other desert animal could, specifically by physically and interpretively reflecting and embodying the values of many desert residents. As anecdotal evidence and literature makes apparent, the

desert tortoise's appeal played a role in the passage of the California Desert Protection Act.

The iconicity of the desert tortoise to the desert community goes beyond its role in the ecosystem, desert politics and conservation. The desert tortoise occupies a particular place in the cultural imaginary as an upholder of desert values and virtues. Desert residents value the ability to survive in harsh conditions. For example, it has been said that a doctor sent WWI veterans to the high desert after being exposed to mustard gas, where their lungs would find relief in the clean, dry air (Goolsby, 2015). The desert is a place for people who can literally and metaphorically stand the heat.

Perhaps Morongo Basin residents need a lot of space comparable to how tortoises need a lot of space. These interviews show that many people working for desert conservation recognize development and human impacts as being the most threatening things to tortoises today. So, could this reflect or reinforce or inflate many residents' general dissatisfaction with the influx of newcomers and tourists to the Morongo Basin? My research suggests that it could.

Together, the data suggest that residents involved in desert conservation are attached to the desert tortoise because of its innate, uncanny ability to reflect place-based values incorporated within the western mythos and imagination. The desert tortoise plays several important roles within the desert socio-ecological landscape. To recap, my findings demonstrate how the tortoise is conceptualized in the following ways:

- As a chess piece, i.e. a pawn, or a tool, that can be utilized by conservationists to forward an agenda, can be a source of conflict, or can encourage collaboration among different stakeholders;

- As the defining spirit, or zeitgeist, of the California Desert community, particularly an icon and symbol of desert conservation;
- As a sentinel of the landscape, with a cultural significance enduring since time immemorial (i.e. for indigenous peoples), and ecological/biological adaptations that reflect several values held by desert residents;
- As a source of magic, an indicator of experiencing the authentic California Desert, evoking a sense of connection and/or attachment through spirituality, curiosity, or joy;
- As a canary in the coalmine, an indicator of not only ecological health, but also of social, cultural, and political change in the California Desert and beyond; and, finally,
- As an idealistic effort evoking both hope and grief in a time when humans are grappling with a mass extinction caused by our own actions, comparable to Don Quixote's endeavor of tilting at windmills.

In line with flagship species literature, the desert tortoise meets criteria to effectively represent and be a surrogate for their respective habitat. The six themes I found in my research altogether tell a story of a people's relationship with an iconic animal. The desert tortoise is admired by locals, and reinforces local values; it is threatened; and it is an indicator of many kinds of change, as it is sensitive to disturbance.

On a broad scale, the implications of tortoise disappearance illuminate the challenges and downfalls of the anthropocene era that we are currently embedded in. As noted in the literature, turtles and tortoises are disappearing on a global scale (Stanford, 2010). According to Stanford (2010), "absent human interference, the suite of evolved factors that characterize modern tortoises would have ensured their survival on Earth for eons to come" (p. 41). As a reminder, at the normal background rate of extinction on the planet, one species would be expected to go extinct about every 700 years (Kolbert, 2014). It is important to consider desert tortoises within the global context of the anthropocene. In fact, in a recent report by The Turtle Conservation Coalition (2018), the

Mojave Desert Tortoise was listed in the top 50 of the world's most endangered tortoises and freshwater turtles.

Tortoise disappearance is clearly of concern to residents who fear that, as tortoises disappear, so does their role in the human imagination. The experience of encountering a desert tortoise in the wild is considered inherently valuable. The decline in number of these experiences threatens the continuation of generations of conservation efforts. For many, a feeling of connection to the desert and its wildlife is what motivated their conservation actions. The tortoise's disappearance, which indicates the decline of the desert ecosystem as a whole, is cause for concern about future conservation being halted by youth's lack of connection to the desert landscape and declining populations of wildlife. This has been a concern for many communities, as evidenced by literature on Nature Deficit Disorder, also known as NDD (Louv, 2005). After analyzing transcriptions of the interviews I conducted for this research, it was clear that the California Desert community also exhibits this concern, i.e. how can someone appreciate a dark night sky if they've never seen one? How can children appreciate wild desert tortoises if they've never encountered them?

The canary in the coalmine narrative is used consistently as a metaphor for recognizing the status of the desert tortoise as an indicator species. This idea of using metaphor to facilitate human understanding is common, and has been researched and explained (Lakoff, 1980). Along with being a proverb, it's a story, as is Tilting at Windmills. The decision to title emergent themes as stories, or phrases from interviews, highlights the narrative inquiry methodology I utilized to analyze my data, and

demonstrates how connections between desert residents and the desert tortoise are grounded in story.

Despite being one of the most researched and monitored reptiles in the world, the status of Mojave Desert Tortoise continues to become only more critical. This disparity between the amount of attention given to the tortoise and tangible recovery demonstrates just how little we understand about ourselves as the primary perpetrators of habitat destruction. Conducting social science research on such iconic wildlife might help us learn how to better mitigate our impacts and change our fellow humans' perceptions, beliefs, and behaviors to make sure these animals are viable into the future.

The research I conducted and share in this thesis could be expanded upon by interviewing tribal members about indigenous cultural connections to the tortoise, as well as by interviewing developers who might not have as much love for the tortoise as conservationists do. The cultural implications of surviving tortoise populations are particularly significant to indigenous tribes, who have coexisted with the species for millennia. The whole story of the tortoise is difficult to compile, and for some stories, we might be running out of time. The next generation may not have their own stories of wild tortoises, and for that reason, it is important that we document not only the tortoise's ecological importance, but also its impacts on our communities, our politics, and ourselves. I hope that the future of desert tortoises exists not only within us, our passions, and our stories, but more importantly, that they exist within the desert wilderness where they belong.

EPILOGUE

It's getting harder to remember that day twelve years ago. As tortoise populations decline, I often wonder how many future generations will be able to experience the awe-inspiring act of stumbling across a desert tortoise in the wild. Would this thesis have been written twenty years from now, if current development and climate trends continue? If I have a child one day, will their experiences with tortoises be limited to those within a zoo, or their own fenced-in backyard?

The idea of protecting something that we believe ought to exist freely and wildly makes sense because as a culture, we value freedom. Not only do residents of the rural southwest value freedom, but also wildness, slow paced living, toughness, hardiness, perseverance, and quiet (qualities reflected in the desert tortoise).

Before this past month, the last time I had seen a desert tortoise in the wild was on a warm morning in early August 2017. I had spent the summer months in Twentynine Palms, sometimes going out to Wonder Valley, trying to find those resident tortoises I had known from years before. There was a day in early June when I found a big, relatively fresh piece of tortoise scat. I brought my friend with me that day, and when I saw the scat, I crouched down, said something to him, like, "Don't be weirded out by this," and then proceeded to snap it in half between my thumbs. *Crack*. "Yep, that's tortoise poop, alright," I said, and I recalled a day in mid-March when I saw tortoise tracks nearby. I was hopeful.

Then there was the evening in July when the sun was setting and I was about a mile out from my parents' homestead, wandering through a thick wash bordered by smoke trees and the dried remains of desert lilies from last spring. I found a large tortoise burrow, and thought of the male tortoise I met that afternoon 12 years ago. As the sun sank deeper beneath purple, silhouetted mountains, the quiet became unnerving, and I imagined coyotes howling in the distance. Or maybe I heard them.

It was early August when I finally saw desert tortoises: three of them. They were equipped with radio-transmitters at the Copper Mountain College Desert Tortoise Preserve.

But on March 31st, I went out walking at a large wash in Wonder Valley, the same one where I found the burrow last July, not far from where I had seen that first tortoise 12 years ago. I was tracking an adult tortoise again, whose small, yet elephant-like footprints were evident in the soft sands of the wash. Something made me look to my right, where I saw this hatchling.



Figure 10. Me looking at a wild desert tortoise hatchling

At first I thought it was a toy, but I knew, rationally, that it was more likely for this little animal to be real. I was going to end this thesis with the story of the last time I saw wild tortoises being in August at the preserve. For whatever reason, the universe didn't want me to do that, and so I get to conclude this journey with these images and memories of a tiny, new-to-the-world, precious sign of hope—an amazing gift that made this work feel so much more personal to me.



Figure 11. Tortoise hatchling

I still feel the same way about watching tortoises as I did when I was a kid. I feel mystified, amazed, and at home. I will continue to make the pilgrimage to Wonder Valley each spring that I exist on this rotating rock, in the hopes that I'll continue to see wild tortoises, carefully crouched down low, arms around my knees, captivated and unmoving for as long as the desert allows.

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APPENDIX

Interview Questions

*Note: Depending on the relevancy of each question to each particular stakeholder, some questions might be omitted during any particular interview. As with any semi-structured interview, these questions may slightly shift depending on the conversation.

1. How long have you lived in the desert? How did you end up in the desert?
2. What do you do for a living?
3. Tell me about personal experiences you've had with the desert tortoise.
 - a. Did this/these experience(s) have an impact on you? If so, in what ways?
4. In your view, what role does the tortoise play in local politics and policy?
5. What do you see as being your primary source of connection to the desert?
6. Why do you think the tortoise has become a nonhuman representative of the Mojave?
7. Do you think extinction of the tortoise would impact the community?
 - a. What sort of impact? Why?
8. Do encounters with local species affect your feelings about where you live? How?
9. For you, how much of a priority is conservation of the tortoise?
 - a. Not a priority / low priority / medium priority / high priority / essential
10. Why do you think it's important to protect tortoise populations?
11. What threats to tortoise populations do you perceive as being the most salient right now?

12. Have you ever had a desert tortoise as a pet?
 - a. If so, please share how that came to be.
 - b. How did this experience affect your perception of the species?
13. What do you think desert conservation would look like without the tortoise?
14. Why do we need to protect biodiversity in the desert?
15. Do you think the tortoise should be listed as endangered (instead of threatened)?
16. What do you think tortoise preservation means for the entirety of the local ecosystem and culture?