

ON THE ACCEPTANCE OF URBAN BEAVERS IN MARTINEZ, CALIFORNIA

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ABSTRACT

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As ecosystem engineers, beavers construct complex riparian and wetland habitats that benefit many other species, including endangered salmonids. Through their landscape alterations, beavers also promote increased groundwater recharge and provide refugia during wildfires and high flow events by impounding water and allowing it to spread across the landscape. Prior to the North American colonial fur trapping campaigns, there were between 60 and 400 million beavers in North America. By the beginning of the 20th century, beavers were extirpated from many parts of the continent, however through human efforts, their population has since rebounded to between 10 and 15 million. The loss of beavers has significantly affected the arid west, including California where beavers had played an important role by impounding water in the surface and water on the landscape. Human tolerance of beaver behavior has been found to be one of the biggest barriers to increasing the number of beavers in California.

Starting in the early 20th century, if beavers caused a disruption in human dominated areas in California, the most common action was to depredate the

animal in order to prevent potential flooding or vegetation damage. However, in the past 40 years, there has been increasing interest in coexistence alternatives where humans mitigate potential damages through various methods, allowing beavers and humans to coexist.

To better understand how social factors affect the decision to coexist with beavers, I conducted a case study of a high-profile event culminating in beaver coexistence which took place from November 2007 through April 2008 in Martinez, California. This was one of the first cases in recent California history where an urban community chose to coexist with beavers rather than remove them. I reviewed documents, transcribed recordings of city council meetings, and conducted 23 semi-structured interviews with individuals who could provide insights relevant to the Martinez events, including an understanding of the factors that contributed to the community's decision to coexist with beavers and the legacy of the Martinez decision. I thematically coded these materials for recurrent patterns and themes. Key findings included: (1) the local history and experiences of those that lived in the area contributed to a sense of place which influenced Martinez's decision to coexist with beavers; (2) the urban location and associated easy accessibility of the beavers and dam helped foster a relationship with the beavers; and (3) coexistence is more likely to occur when people can experience wildlife through non-conflict-oriented interactions before conflicts arise.

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INTRODUCTION

Until recently, lethal management had been the de facto method of dealing with problematic North American beavers, *Castor canadensis* since the early 20th century. When beavers caused flooding or property damage, a depredation permit would be issued, and the offending animal(s) would be trapped and killed (Baker & Hill, 2003). In the late 1990s, beaver management experts on the Atlantic Coast of North America began experimenting with methods of beaver harm reduction and damage mitigation methods in the hopes of allowing for coexistence with beavers (Castro, Pollock, Jordan, Lewallen, & Woodruff, 2015). Some management organizations in California, such as the Sacramento Area Flood Control Agency, had attempted to use these coexistence strategies, however managers deemed them ineffective and lethal management methods continued to prevail (Martinez City Council Meeting for April 16, 2008). Even though coexistence methods had been developed, they continued to be met with skepticism and had not been widely implemented in California.

When a pair of beavers settled in an urbanized, section of the Alhambra Creek running through downtown Martinez, California, a city of 38 thousand people on the Northeast edge of the California Bay Area, the city made – at the time – a nearly unprecedented decision to coexist with the beavers rather than remove them. The conflict and decision-making in the case of the Martinez Beavers was high profile and widely reported in the news media. It continues to be discussed in beaver management circles and several of the individuals who were involved in advocating for the beavers in

Martinez have since gone on to advocate for beavers and coexistence management throughout California and beyond.

In 2006, beavers moved into the Alhambra Creek where it runs through downtown Martinez, California. Many locals came to appreciate and connect with these beavers, coming to call them the Martinez Beavers. The usual beaver concerns over potential flooding and property damage brought the question of beaver management before the Martinez city manager, city council, and eventually a beaver subcommittee. The standard management option, and in fact the option recommended by the California Department of Fish and Game (CDFG), since renamed to California Department of Fish and Wildlife (CDFW), was to have the beavers depredated, a jargonistic way of saying killed. However, outcry by many Martinez residents forced the city to implement methods of coexistence with the beavers. This decision to coexist with beavers in Martinez has become a part of a growing movement in interest in the ecological role of beavers, recognizing their importance.

The events in Martinez were one of the early events that brought nonlethal beaver management into the public focus in California and, through social science methods, can provide useful information about community acceptance of beavers and what social factors are significant for coexistence. This thesis will draw from a multi-method social science approach including 24 interviews and a review of documents, public meetings, and literature to understand the community of Martinez's actions around beaver management and address the following research questions:

1. What was it about Martinez that drove so many community members to fight for the existence of beavers in the city?
2. What impacts has coexistence with the Martinez Beavers had, both in the city and on the broader discussion around beaver management?
3. What lessons about wildlife—and specifically beaver – management can be learned from the decision to coexist with beaver in Martinez?

Case Study Background

People in Martinez first noticed beavers in the Alhambra creek in early 2006 when a pair of beavers colonized the Alhambra Creek where it ran through downtown Martinez (Figure 1). Residents had not seen beavers in the Alhambra Creek before, so the novelty of the beavers, along with their publicly visible dam and lodge, quickly garnered local attention, first out of interest in the industrious animals and later out of concern for the animal's potential to cause damage. Martinez's downtown had been plagued with regular flooding and as a result the City, along with Local, State, and Federal partners, implemented a flood control project, completed in 2002, that additionally restored sections of the creek. Some people were concerned that the beavers were damaging the restored creek while others worried that the beavers would contribute to further flooding. By mid-2007, these concerns reached City Staff, who found that the standard means of managing beavers was to



Figure 1 The location of the Martinez Beaver dam site in the downtown area of Martinez, California.

depredate or kill the animals, so city staff began acquiring the necessary deprecation permit. However, before the beavers could be killed, word got out to the public, the majority of whom did not approve of deprecation. Several City Council members used their political power to allow for the beavers to be moved, rather than killed, an option that was unheard of in California at the time. The City Council set beavers as the main topic of discussion for the November 7, 2007 city council meeting. More than 200 people showed up to the meeting in support of the beavers and 44 people spoke for a collective 1.75 hours. By the end of the meeting, it had become apparent that the majority of people engaged in the discussion wanted the beavers to remain in the creek and that neither deprecation nor relocation would be acceptable alternatives. The Council created a subcommittee to find an acceptable solution.

The Beaver Subcommittee found that vegetation could be protected either with fencing or paint with sand mixed in and that a flow device, a tube installed in a beaver dam to control the amount of water impounded, could be installed to protect against flooding. These solutions were implemented, but property owners adjacent to the dam continued to fear damages around burrowing; in response the city installed sheet pile in the bank of one property to allay these fears, which contented the property's owners. Beaver advocates feared that the city would depredate the beaver in the future once public interest moved away from the beavers, so they started Worth A Dam (WAD), a nonprofit focused on beaver advocacy, and began planning a beaver festival that would come to be an annual event.

As the beavers gained the public's attention, the local newspaper began covering them, and as the controversy around them grew, so too did the interest in the beavers. First other papers in the county began covering the beavers, then larger papers in the Bay Area followed suit. This story of local wildlife coexistence quickly snowballed from the pages of the print-only, three-times-a-week local newspaper into the San Francisco Chronicle, one of the top 20 most widely distributed papers in the United States.

The division lines around the management were not very clear cut, though many in Martinez didn't see the complexity. Many people perceived the downtown business owners and city officials as the primary people pushing for beaver removal and saw the majority of the public in support of keeping the beavers. It was more complicated than this because, as demonstrated during public comments at the city council meeting, there were business owners in support of coexistence with beavers along with two city council members. There were people working for the city that pushed for beaver removal, but after much public input, they became amenable to coexistence. A downtown property and business owner was one of the most publicly vocal advocates for beaver removal. Throughout the discussion of beaver management, Heidi Perryman, who went on to found WAD, a beaver advocacy group, was one of the most vocal advocates for the Martinez Beavers.

The beavers remained in the downtown area until 2015, and in that time raised raising 16 kits who dispersed into the surrounding area. In this time a number of beavers both died and migrated away from the dam site, likely leading to more beavers in the Alhambra Creek drainage basin. While there are no longer beavers in Downtown

Martinez, one will occasionally be spotted in the outskirts of the city and some residents will become excited with the prospects of beavers settling in the city once again.

Background on Beavers

The North American beaver, heretofore referred to as beavers, is the largest rodent in North America, weighing between 16 and 31 kg and measuring up to 1.2 meters in length (Baker & Hill, 2003). Beavers are native to much of the continental United States, excluding some of the swamps of the Southeast and deserts of the Southwest (Baker & Hill, 2003; Lanman et al., 2013; Lanman, Perryman, Dolman, & James, 2012). On land, beavers are typically slow and vulnerable to predation while they either waddle on four legs or walk on their rear legs while carrying materials in their front legs. They spend much of their life in and around the water where they can swim more agilely and dive underwater to evade predators. Beavers will construct lodges or bank dens with underwater entrances, providing safety from potential predators. Beavers are herbivores, eating both herbaceous and woody material (Baker & Hill, 2003; Tappe, 1942).

Ecology

Beavers have earned the designation of ecosystem engineers because of their tendency to modify their environment to suit their needs. Beavers will construct dams out of wood, vegetation, and mud to raise water levels in areas where stream levels are not sufficient for beaver's uses (Rosell, Bozsér, Collen, & Parker, 2005). Beavers will often build a series of dams to expand the surface water, and if they occupy an area for an extended period, will dig additional canals to extend their area of aquatic safety and

increased mobility (Baker & Hill, 2003; Law, Gaywood, Jones, Ramsay, & Willby, 2017). Beavers will use the water to float woody building materials, further aiding their mobility in the water. These built structures will degrade without maintenance and can be washed out by high flows (Pollock, Heim, & Werner, 2003). While these modifications are undertaken to benefit beavers, they also have large impacts on riparian ecosystems.

Beaver dams have complex effects on both the morphology and hydrology of streams (Naiman, Johnston, & Kelley, 1988). The dam slows the flow of water in the stream, causing in stream sediment to settle out of the flow, meaning that water downstream of the dam will have a lower turbidity (Pollock et al., 2003). As organics settle out, the soils of the beaver wetlands become more nutrient rich, leaving fertile meadows once beaver relocate and their dams degrade (Goldfarb, 2018; Law, Mclean, & Willby, 2016). As the water begins to impound behind the dam, the wetted perimeter of the stream increases, which in-turn increases the ground water recharge and the surface/ground-water interchange (Westbrook, Cooper, & Baker, 2006). The increased ground water recharge is particularly beneficial in arid climates where it can allow perennial streams to have higher base flows and allows ephemeral streams to flow for longer or even turn them perennial (Albert & Trimble, 2000; Law et al., 2017). The increased surface/ground-water interchange makes the temperature profile of the stream more heterogeneous both at the dam site and beyond (Westbrook et al., 2006).

Beavers' alteration of the physical landscape has significant ecosystem consequences. By creating novel habitats, beavers introduce more heterogeneity into the landscape, which in turn can allow for more species diversity (Rosell et al., 2005). Over

extended periods, 10+ years, beaver wetlands have been found to increase vegetative species diversity, allowing new wetland favoring plants to colonize the area, while species that had adapted to seasonal flooding persist, but with lower populations (Law et al., 2016; Wright, Jones, & Flecker, 2002). Beavers also significantly affect the fauna through their ecosystem alterations. Beaver wetlands have been found to increase species richness for aquatic, riparian, and terrestrial birds (Aznar & Desrochers, 2008; Campos, Loffland, & Burnett, 2019; Cooke & Zack, 2008; Rosell et al., 2005) as well as various amphibian species (Hossack et al., 2015; Stevens, Paszkowski, & Foote, 2007). Beavers have a more complicated effect on fish because, while beaver ponds and wetlands provide good rearing habitat and slow water refugia during high flows, their dams can block fish passage (Kemp, Worthington, Langford, Tree, & Gaywood, 2012). Recent studies off the west Coast of the United States indicate that native anadromous fish tend to be better at navigating blockages than non-native fish (Bouwes et al., 2018; M. Pollock et al., 2018). Environmental restoration practitioners have become interested in integrating beavers into restoration efforts as a form of process-based restoration because of the extent to which beavers beneficially alter their environment (Abrams, Johnduff, & Charnley, 2019; Burchsted, Daniels, Thorson, & Vokoun, 2010; Law et al., 2017; Pilliod et al., 2018; M. Pollock et al., 2018).

History

An estimated 60 to 400 million beavers occupied streams across North America prior to the arrival of European colonists (Baker & Hill, 2003). A primary goal of colonization was to extract riches from the continent, and some of the greatest treasures

to be found were beaver pelts. The Eurasian Beaver, *Castor fiber*, had already been extirpated from much of Europe because its prized fur could be felted into fine garments, so a continent with a fresh stock of beavers was viewed as a continent full of potential riches (Goldfarb, 2018). Some Indigenous Peoples traded beaver pelts to the trappers while others refused to do so because of the cultural and ecological importance of beavers (Dolin, 2011). Trappers lead the western expansion across North America, trapping fur bearing animals until populations were depleted, then moving to virgin territory. Settlers would soon follow in the wake of the trappers, making use of the explored, mapped, and, to many settler's perspectives, tamed areas (Dolin, 2011).

On the West Coast of North America, trapping was a political tool (Dolin, 2011). Both the British Empire and the United States claimed lands to the south of the Columbia River. In the 1820s, the Hudson Bay Company, which represented the authority of the British Empire in the region, sent trapping expeditions South in the hopes of claiming the land through trapping. The belief was that if British trappers could trap all the beavers before American trappers could arrive, it would discourage American settlers from settling the area (Lanman et al., 2013; Lanman et al., 2012). This was not the case, but these political machinations did lead the West Coast from the Columbia River to San Francisco to become a fur desert, devoid of beavers (Tappe, 1942). Accurate records of the numbers of beavers trapped are scarce, so there is currently no estimates of what the population of beavers were in California before this trapping effort.

The 20th century saw attitudes towards beavers change as their populations were depleted by trapping and the market interests shifted away from furs (Dolin, 2011).

Wildlife management agencies recognized beavers as an important species and thus began reintroduction campaigns and limited trapping to get beavers back on the landscape. At least 1,221 beavers were reintroduced onto the landscape and researchers believe it is from this reintroduction that much of the current Californian beaver population originated (Lundquist & Dolman, 2016). These efforts saw enough success that the reemerging beaver population began to come into conflict with people (Tappe, 1942). Because beavers had been trapped out before the arrival of settlers and America developed in a landscape largely devoid of beavers, the expanding beaver population came to be seen as a nuisance.

Management

Because of the extent to which they modify their environments, beavers often come into conflict with humans. Beavers can disrupt landscaping by gnawing down trees and eating vegetation and can disrupt human land uses and damage infrastructure through flooding caused by damming waterways (Jonker, Muth, & Siemer, 2006; Payne & Peterson, 1986; Purdy, Decker, Malecki, & Proud, 1985). Drainage ditches and culverts are particularly vulnerable to disruption by beavers because only a small area must be dammed to impound a large amount of water (Jensen et al., 2001). Beavers can also destabilize banks and riparian areas by digging bank burrows. When beavers cause disruptions, the most common response is to depredate -or kill- the disruptive animal(s) (Baker & Hill, 2003; Hill, 1976; Siemer, Jonker, & Brown, 2004; Wigley & Garner, 1987). Killing, however, is not a long-term solution because beavers disperse into desirable habitat, so unless beavers are extirpated from an area, it is likely that another

beaver will re-settle in favorable habitat conditions, thus perpetuating a repeated cycle of trapping and recolonization (Bhat, Huffaker, & Lenhart, 1993).

Over the last two decades, alternative, non-lethal beaver management methods have become more widely used due to the efforts of dedicated biologists, management professionals, and beaver activists, colloquially known as “beaver believers” (Goldfarb, 2018). Beaver management professional Skip Lisle developed a method of excluding beavers from drainage culverts, called the beavers deceiver, which works by misdirecting beavers to build in the wrong directions (Simon, 2006). Similar solutions have been devised to protect vegetation and to control flooding. Vegetation can be wrapped in wire fencing and trees can be painted with an abrasive paint to prevent beavers from disturbing them (Lundquist & Dolman, 2016). Flooding can be controlled by a pond leveler, a flexible pipe with one end in a cage at the bottom of the pond and the other embedded in a dam; the level at which the pipe is positioned in the dam then controls the water level of the pond (Taylor & Singleton, 2014). Having a device installed that allows for coexistence not only allows beavers to remain on the landscape, but it has also been found to be more cost effective than continual trapping of nuisance beaver (Callahan, Berube, & Tourkanatonis, 2019). As human and beaver populations both continue to grow (Siemer, Jonker, Decker, & Organ, 2013), these methods of coexistence are increasingly important.

Because of their potential to cause disruptions, beavers have been central to discussions of appropriate wildlife management actions. They were the impetus for the development of the wildlife acceptance capacity (WAC), a framework for determining

appropriate wildlife populations (Purdy & Decker, 1988; Purdy et al., 1985)). This framework acts as the social counterpart to ecological carrying capacity, stating that nuisance activity toward humans can be a limiting factor to beaver population size. Even if an animal can have negative impacts on human populations, that animal is acceptable as long as the population remains small enough so that the negative impacts are not felt by people. If the population reaches sufficient levels that they become a nuisance, the population will be controlled (Purdy & Decker, 1988). Siemer et al. (2004, 2013) built upon the WAC concept, developing a causal loop diagram explaining public pressure for trapping beavers based off survey data for Massachusetts and New York. This concept accounted for various forces contributing to beaver depredations, including beaver populations and public education. They identified the availability of information and technical assistance as important factors in deciding an appropriate response, with more information and assistance decreasing problematic beaver behavior. The most recent WAC research done on beaver was out of Oregon and showed that financial compensation for damages caused by beaver to property owners encouraged landowners to accept beaver on their property (Morzillo & Needham, 2015). My research will explore the limitations of WAC and the ways that tolerance can be impacted through positive interactions.

LITERATURE REVIEW

I will be examining the beaver management event in Martinez through two primary lenses: place and wildlife. I will review the way that the concept of place has evolved, and I will primarily focus on the field of geography, but I will also touch on several other disciplines that use the concept. I will also be drawing on three bodies of literature to explore the case from a wildlife perspective: wildlife management, human-wildlife interactions, and wildlife in urban and human dominated spaces.

Place

Concepts around place are relevant to wildlife management decisions because these decisions are about control of places. Tim Cresswell (2014), a preeminent geographic scholar on the concept of place describes place as a location with meaning. This definition matches the typical uses of the word, but over time the ideas of what the meaning is, how it is acquired, and who gets a say in that meaning have changed in ways that bely the simple definition. Place is a commonly used word with complex underpinnings in geographic theory.

Place has always been a central concept to geography, however prior to the mid-20th century, geography tended to focus on the differences between areas of the Earth, defined as regions. In regional geography, geographers would define a region based on characteristics common to an area (e.g. language, political control, climate, etc.) or to

encyclopedically list characteristics of defined regions (Cresswell, 2014; Murphy & O'Loughlin, 2009).

Tuan (1975) discussed how various scales of place ranging from nation-states to places in homes are experienced (Figure 2). The larger a place is, the less likely it is that a person could conceivably experience the whole of it in a way that would create meaning through lived experience, so the larger places tend to be more abstract than the smaller places. Regions, neighborhoods, and to a lesser extent, places inside homes, were noted for not having a strong social conception as meaningful scales of place. Home is discussed as a particularly meaningful scale of place with strong associations of rootedness, nurturing, and shelter. The discussion of home became an entry point for critical geographers to begin examining the concepts of place.

Gillian Rose (1993), a feminist geographer, took issue with the descriptions of what home represented because many women had a different experience of home, which often involved labor, isolation, and sometimes abuse. This brought into focus the ways that place is socially constructed and experienced differently

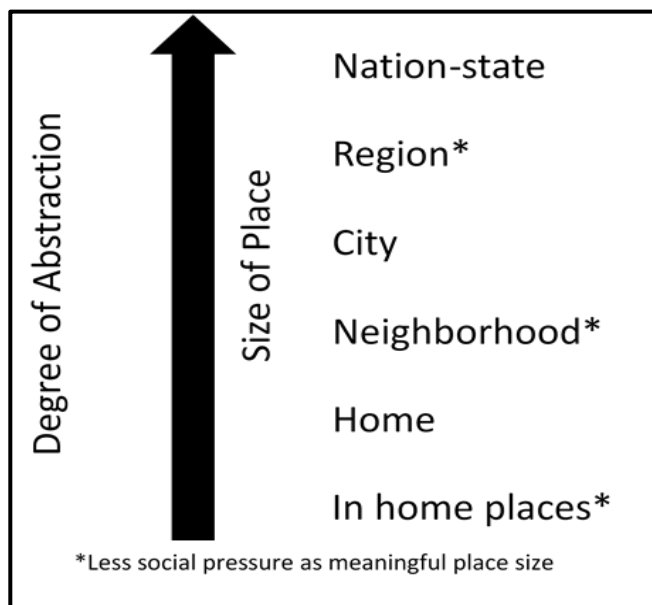


Figure 2 Yi-Fu Tuan's conception of scales of place

depending on one's identities, which catapulted the concept of place into radical, later called critical, geography (Cresswell, 2014).

Critical geography draws on Marxist conceptions of power structures and seeks to show the mechanisms by which social inequities arise (Blomley, 2006). Critical geography largely discusses place in the context of power in creating places' meanings and through the study of exclusionary places (Cresswell, 2014). Within this conception, place is a socially constructed concept, largely built by attaching specific meaning to places by expressing implicitly or explicitly which specific people, activities, or ideas do or do not belong in place (Cresswell, 1996) Redlining is an example of how exclusionary practices, in this case mortgages were used to exclude people deemed undesirable (Mitchelle & Elwood, 2015). Literature on place can help unravel the story of what took place in the Martinez beavers where community members debated the very definition of their place and whether beavers as a part of the downtown landscape were compatible with their place understandings. This case study also touches upon who has the power to define what is or is not appropriate in public spaces.

John Agnew (2014) incorporated elements of humanistic and critical geographies in his framework of place, which focuses on three aspects of place: location, locale, and sense of place. The location is the physical space that the place exists in or the area within the locational boundaries. The locale is physical environment in which interactions take place, both between an individual and their environment as well as interpersonal interactions. Sense of place has been defined as the experiential perceptions of the environment and meanings, both individual and collective, that are associated with

particular locales (Agnew 2014). Sense of place has come to be used broadly in geography and other disciplines and is a loosely defined concept that examines people's experience of physical locations (Shamai, 1991; Shamai & Ilatov, 2005). Stedman (2003) discusses sense of place as encompassing the meaning, attachment, and level of satisfaction people ascribe to a physical environment.

The concept of place attachment used in environmental psychology is similar to sense of place (Hashemnezhad, Heidari, & Hoseini, 2013), however literature on place attachment has examined how place meanings are formed through experiences and social pressures in greater detail than that of sense of place, specifically focusing on the importance of a place's history (Lewicka, 2008; Stefaniak, Bilewicz, & Lewicka, 2017), which can be useful in understanding how a place's past affects the current experience of place. The concept of sense of place can be useful for understanding human-wildlife interactions such as those between Martinez residents and the beavers. Attention to the relationship that residents have to their landscape and the narratives and history they attached to it, can provide insights into how community members ended up reacting to and creating narratives surrounding the beavers who entered their "place".

Tuan (1991) came to be fascinated about the ways that language and stories were important in the formation of places; he called this method of looking at language and place a narrative-descriptive approach. Drawing from this approach, I compiled the scattered stories that different people told about the place of Martinez into narratives that can help to explain what management decisions would or would not be appropriate. Other researchers looking to explore the role that history and heritage can play in local

management have used place narratives as a tool to understand how people think about and relate to places (While & Short, 2011). I am using a similar concept of place narratives that draws on elements of sense of place, and then compile them into a cohesive narrative about the place. Two place-narratives of pre-beaver Martinez emerged from the interviews, meetings, and documents, and a third narrative of Martinez as a place of beavers has emerged as a result of the events of the case study. This approach highlights the historic and place-based factors that influence a management decision, yielding a greater qualitative depth to understanding what actions would and would not be appropriate to a given area. This has not received much attention within academic literature on wildlife management.

Wildlife

Western Cultures tend to have adopted a humanistic, enlightenment-based approach to nature which positions humans as something separate from nature. The enlightenment-based approach operates from a perception that language and reason position humans above animals, which are seen as reactionary automatons, and nature is put in a dialectic with civilization and culture (Watson & Huntington, 2008). Similarly, Western cultures tend to differentiate the living things that have been domesticated and tamed from those that have not, with the latter generally designated as wildlife (Manfredo, 2008). Within this understanding of wildlife, the management of the Martinez beavers can easily be classified as a wildlife issue.

Literature from the field of wildlife science – and in particular the growing field of human dimensions of wildlife – can provide frameworks for thinking about the conflict and decision-making related to the beavers in Martinez. Human dimensions research in wildlife is done with two primary objectives: helping managers better understand public values so wildlife can be managed accordingly, and helping managers understand the reasons behind conflicts so wildlife can be managed in a way that minimizes conflicts (Manfredo, 2008). This is largely done by applying psychological and sociological methods to wildlife management.

I will be discussing the management in Martinez as it relates to three different levels of specificity within wildlife literature. The public perceptions of lethal wildlife management, human wildlife interactions, and urban wildlife.

Shifting Public Perceptions of Lethal Wildlife Management

In the Martinez case, a community grappled with the use of a lethal management strategy for beaver removal. Human dimensions literature related to public perceptions of lethal wildlife management strategies in other species and locations, can provide insights for understanding this case.

In the United States, wildlife is managed under the public trust doctrine, meaning that the state acts as the trustee, managing wildlife for the benefit of the public (Organ, Decker, Stevens, Lama, & Doyle-Capitman, 2014). The public values have played a larger role in wildlife management since the 1970s, often pressuring for the restriction of lethal management methods (Eeden, Dickman, & Ritchie, 2017), such as what happened in 1972, when public and media campaigns lead the Nixon administration to ban the use

of poison baiting as a method of carnivore, particularly coyote, control (Flores, 2016). Sometimes the public demands are not in line with what the best science indicates is the best approach (Eeden et al., 2017). Human dimensions of wildlife researchers have found that the public is more amenable to initially unpopular management methods, such as lethal management options, when the public is engaged as a stakeholder in the management discussion (Manfredo, 2008).

There is still public resistance to lethal management which has resulted in efforts to implement more wildlife coexistence approaches. Coexistence strategies, while broadly popular, can have negative repercussions, which can be felt disproportionately. For example, research by Jordan et al. (2020) showed that coexistence forms of management of large carnivores meant that rural communities had to deal with greater losses. Losses range from financial losses experienced by livestock producers in the United States when urban based activists push for wolf conservation (Steele, Rashford, Foulke, Tanaka, & Taylor, 2013) to loss of life, such as the 1000 people that were killed in Tanzania over a 30 year period and locals were expected to conserve the potentially deadly species (Jordan, Smith, Webster, Appleby, & Eeden, 2020).

Human-Wildlife Interactions

There have been several recent criticisms of the phrase “human wildlife conflict” because it positions disruptive wildlife as intentional antagonists, which can influence the perceived risks that wildlife pose (Peterson, Birckhead, Leong, Peterson, & Peterson, 2010). There is a growing understanding that many wildlife conflicts are often the result of misunderstandings or social conflicts between groups of people rather than actual

conflicts with wildlife (Redpath, Bhatia, & Young, 2015; Young et al., 2010). This can take many forms. Conflicts about balancing wildlife conservation with local livelihoods may actually be conflicts between people about wildlife, rather than conflicts with wildlife (Bhatia, Redpath, Suryawanshi, & Mishra, 2020). Another way this can present itself is through misinformation affecting people's perceived risks from wildlife (Dickman, 2010). In the cases in which the conflicts are with the wildlife, such as carnivores feeding on livestock or even wildlife attacking people, the conflict is only perceived as such by humans. The wolf (*Canis lupus*) attacking sheep or cattle are not aware that attacking the livestock would cause conflict, they only see easy potential prey (König et al., 2020). Seeing the interaction from a less human-centric vantagepoint can change the way the interaction with wolves are perceived.

The cognitive hierarchy model seeks to explain why people think the way they do and how these thoughts then translate into behaviors and actions (Fulton, Manfredo, & Lipscomb, 1996). Under this framework, a small number of values form the foundation of thought, which then hierarchically affect beliefs, attitudes, norms, behavioral intentions, and then behaviors (Figure 3). Fulton et al. (1996) related this model to wildlife through values orientations that were connected to wildlife through the beliefs that the values orientations influenced. They found two major values orientations based around wildlife consumption and wildlife appreciation. Wildlife consumptive values orientations were connected to beliefs around hunting, fishing, and similar extractive use of wildlife whereas wildlife appreciation was connected to beliefs around appreciation of wildlife, including appreciating wildlife in residential environments, wildlife viewing as

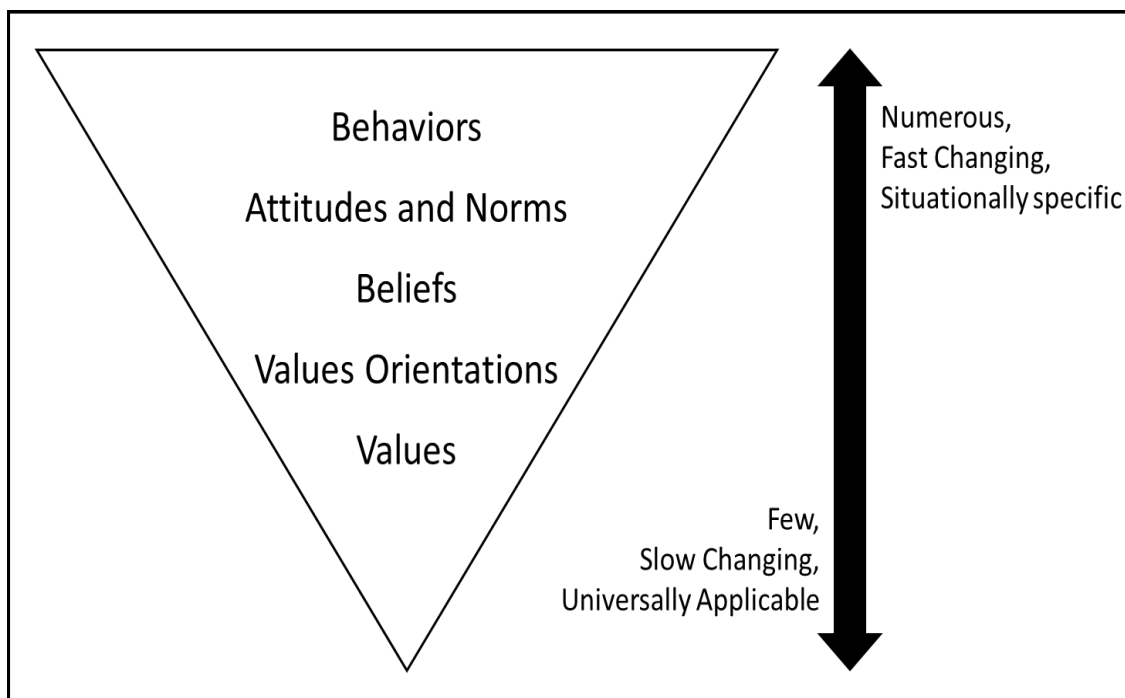


Figure 3 Cognitive hierarchy model as described by Fulton et al. (1996)

recreation, and belief in the general importance of the existence of wildlife. These two orientations help to predict connected beliefs. For example, someone that fishes is likely to believe that other extractive uses of wildlife are also appropriate, and that same person could appreciate wildlife in residential settings, which would indicate they might be more likely to believe in the value of the existence of wildlife more broadly. This model has been used by wildlife managers in Anchorage, Alaska to guide management decisions surrounding the management of moose and bears with methods in line with public values (Whittaker, Vaske, & Manfreda, 2006). The Martinez case study examines an event when public values impacted the wildlife management decision and lends insights into the ways in which public values can impact management.

Wildlife in Urban and Human Dominated Areas

As human populations and demand for natural resources grows, so too does the amount of land that is dominated by human activities, leaving less natural spaces for wildlife to occupy. Additionally, wildlife habitats are often fragmented by human activities and land uses. The results of this are that some species adapt to urban areas by habituating them, while other species live on the edge of human dominated areas and utilize them for resources, and still other species avoid urban spaces completely. Studying urban wildlife is important not only because more wildlife is becoming urban wildlife, but because urban environments are the primary place where many people are interacting with wildlife (Soulsbury & White, 2015). According to the cognitive hierarchy model (Figure 3), values and value orientations are formed at a young age. Research indicates that for people to care about wildlife, they must be exposed to it, and if wildlife are limited to natural environments, then only those urbanites affluent enough to visit natural areas will be able experience wildlife, which adds a dimension of socioeconomic status to the enjoyment of wildlife (Belaire, Westphal, & Minor, 2016). The presence and experience of urban wildlife can have impacts on perceptions of conservation outside of urban environments (Shwartz, Turbé, Simon, & Julliard, 2014). If people are disconnected from wildlife in cities, they will come to not care about wildlife elsewhere. As a part of my case study, I am exploring the ways in which urban beavers of Martinez has had impacts beyond the city itself. I am also examining the ways in which the close proximity of people in an urban environment can exacerbate concerns about urban wildlife, particularly with a species as potentially disruptive as beavers.

METHODS

This study drew from a case study approach to explore one case of a human-wildlife conflict in detail and uses it to derive insights to broader theories related to human-wildlife interactions. A case study approach is typically a non-sampling method that uses analytic generalizations to apply existing theory to real life events and is used to exemplify and give a better understanding of existing theories (Stake, 1995). Case study research typically involves a mixed methods approach, using triangulation within the data to corroborate results (Tellis, 1997). This project draws from three methods: semi-structured interviews with individuals connected to the case, a review of documents and public meetings related to the case, and participant observation of the continuing beaver activism that resulted because of the Martinez Beavers. I was forced to alter my methodology significantly as a result of the outbreak of COVID-19

Study Site Description and History

Martinez sits on the Northeastern edge of the San Francisco Bay Area, on The Carquinez Strait (Figure 4). The Carquin, Saclan, and Chupcan Tribes occupied the land where Martinez sits prior to Spanish colonization (East Bay Regional Parks District, 2019). Documentation of beavers around San Francisco Bay suggest that beavers would have been present in the area at this time (Lanman et al., 2013), however, extensive trapping by the Hudson Bay Company, among other trapping outfits, largely extirpated

beavers from the area through the first half of the 19th century in an effort to discourage settlement and territorial claims by the United States (Tappe, 1942).

In 1847 the first ferry service in the bay was established connecting Martinez to Benicia. When the 1849 California Gold rush began, Martinez gained prominence because of the ferry service and was designated as the county seat of Contra Costa County in 1851. Agricultural production became a main economic driver for Martinez along with the burgeoning

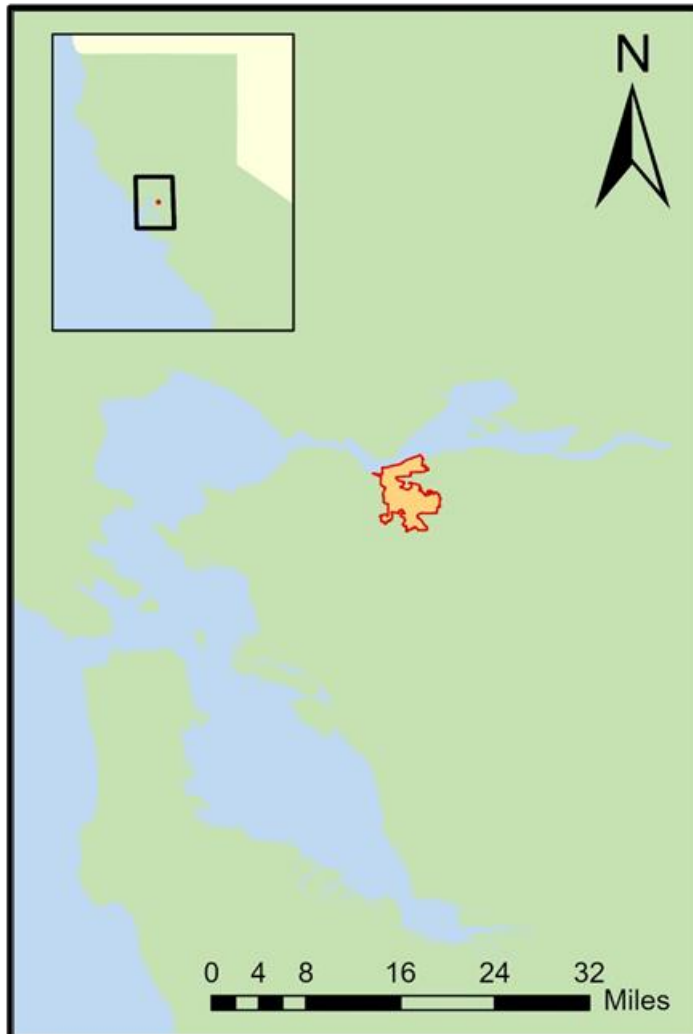


Figure 4 Map locating Martinez, California

shipping industry (Martinez Historical Society, n.d.). In 1869 these industries came together when Dr. John Strentzel, a prominent local horticulturalist, devised a means prolonging the freshness of fruit, allowing it to be shipped greater distances. As the area continued to develop, it did so in the absence of beavers, so it is likely that colonists never had to adapt to living with the rodents. In 1880 John Muir married Louisa Strentzel, the daughter of John Strentzel, and moved to Martinez, making it his adopted

hometown (Worster, 2008). The Golden Eagle oil refinery began operation to the East of Martinez in 1913. The following year John Muir died and was buried in Martinez. A second refinery, this one operated by Shell Oil, began operations a year later in 1915 (California Energy Commission Staff, n.d.). These refineries acted as a significant driver of economic stability in Martinez. As part of a reintroduction program spanning from 1923 to 1950, beavers were introduced to Contra Costa County (Lanman et al., 2013); these animals may have been the progenitors of the Martinez Beavers.

The population of Martinez had grown to nearly 10,000 people by 1960 and saw relatively rapid growth over the following three decades (Figure 5). Through this period, there were heated debates over whether to increase development to further spur growth, with the side against development largely prevailing. Adjacent municipalities embraced development and grew much more than Martinez. By 1990 the population had increased

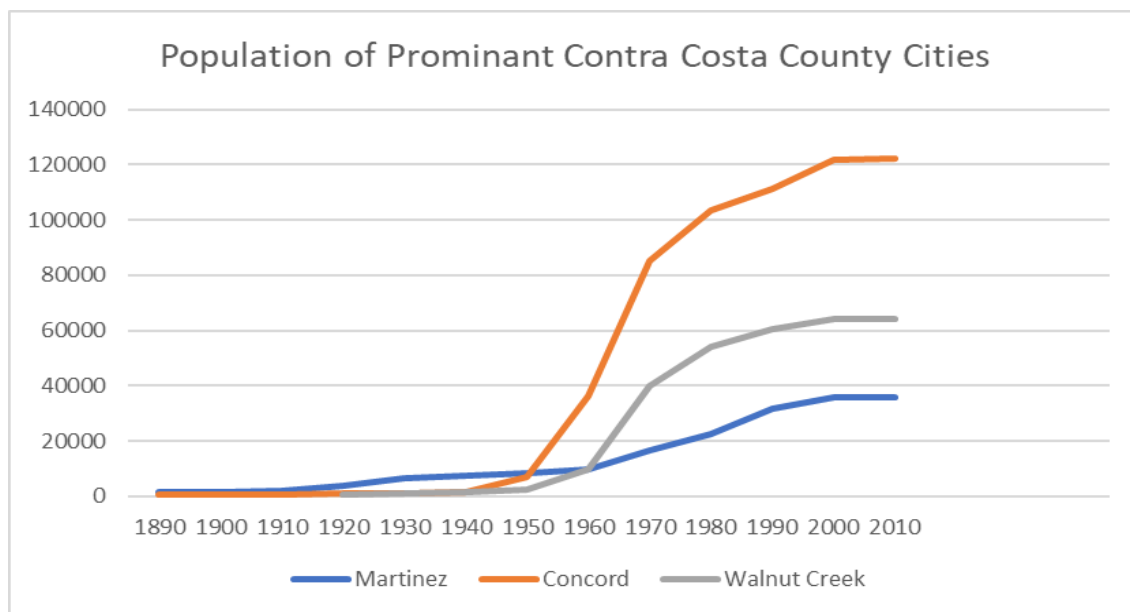


Figure 5 The change in population of Martinez, Concord, and Walnut Creek, three prominent cities in Contra Costa County. Data from U.S. Decennial Census

to more than 31,000, at which point growth slowed. In addition to local resistance to development, the regular flooding of the Alhambra Creek was another factor explaining why Martinez did not grow as much as adjacent towns. With a two-year rain event, the Alhambra creek would overflow, flooding both the downtown and other creek adjacent properties. In an effort to reduce flooding, the City, in conjunction with local businesses and agency partners, implemented a creek improvement project aimed at restoring a more natural environment to the creek and reducing flooding. The project was based off a similar enterprise undertaken in San Louis Obispo in the 1970s.

COVID Changes

The context of the COVID-19 pandemic required me to be creative about my research approach and develop ways to conduct social science research while protecting public health and safety. I had planned to conduct the in-person portion of my research while living in Martinez for six weeks which would have allowed me the opportunity to conduct in-person interview and participant observation, however I was unable to go to Martinez due to the outbreak of COVID-19. During this period, I also had planned to immerse myself in the local area including attending city council meetings, talking with locals, and attending the annual beaver festival. I was only able to contact people remotely, through phone, email, social media, or letter, and was unable to get in contact with many people that were in favor of beaver removal, and the beaver festival was canceled due to public safety concerns.

Semi-structured Interviews

Before conducting human subjects research, I received permission to do so from the Humboldt State Institutional Review Board (IRB): protocol number IRB 19-117.

I interviewed 23 people from two different groups: 16 with experience relating to the Martinez case and seven with experience relating to beaver management more broadly (Table 1). Five of my interviews were with people involved with the Martinez City Council’s decision-making process, either as City Council People or beaver subcommittee members, one of whom was interviewed twice. Seven interviews were with people embedded in the Martinez Community and thus able to speak to the community effects of beaver coexistence. Three interviews were with people that lived in Martinez during the beaver event but had not been long-term residents and thus were able to provide more of an outsider’s perspective, less influenced by local politics and history. Additionally, I conducted interviews with three beaver management experts, two agency staff, and two people influenced by the Martinez beaver management outside of Martinez. I have numbered each interview in each interview category and will refer to Table 1 Break down of semi-structured interviews by category and subcategory

Category	Number of interviews
Martinez experiences	16
Involved with city (IwC)	6
Community member (CM)	7
Short term resident (STR)	3
Broader Beaver experience	8
Impacted by Martinez (IbM)	3
Agency staff (AS)	2
Beaver experts (BE)	3
TOTAL	24

this number and category abbreviation and year, when citing interviews (e.g., One of the beaver subcommittee members interviewed would be cited as IwC-2, 2020). If multiple interviews are cited, then the year will only be included with the last one.

I reviewed documents relating to the Martinez case study to find my first interview participants and then used snowball sampling to find additional participants. Snowball sampling is an efficient method of finding interview participants by asking current participants to help identify or contact additional interviewees (Cohen & Arieli, 2011). I identified people with broader beaver experience through review of existing beaver related literature and documents and through snowball sampling of people in Martinez.

Potential interview participants were contacted either through email, phone call, message through social media, or letter; were given information about my project; and were invited to participate. Those who expressed interest in participating were emailed or mailed a consent form, giving an overview of the project and several options for how information from the interviews would be attributed and used (See Appendix A). Interviews were conducted remotely either over phone or Zoom virtual conference. If participants gave permission, I recorded the interviews for future transcription or analysis in addition to taking notes. Five participants declined to be recorded, so I took detailed notes during the interview. I reviewed the below documents and public meetings as well as existing beaver related literature to develop interview guides for use during interviews. My interview questions focused on individuals' experience with the beavers, involvement in the decision-making process, and opinions on outcomes (for full questions, see

Appendix B). The interview guide is a loose set of questions meant to provide direction to the interview while allowing flexibility in how the interview is ordered and conducted.

Document and Meeting Review

Documents and public meetings are primary sources from the time of the case study and so can provide a better understanding of what was actually going on at the time whereas interviews were conducted more than a decade after the events of the case study. The documents and public meetings also help to provide insight into perspectives that I was unable to capture in my interviews. The City Council's decision-making process produced two reports on potential management responses to the beavers (Table 2). The first, produced by council staff leading up to the November Council meeting, found no feasible alternative to lethal management and recommended that the beaver be trapped with a depredation permit. This report will be cited as Alhambra Creek Beaver Dam Report (ACBDR, 2007). The second, produced by the beaver subcommittee, recommended adaptations that would allow for coexistence with the beavers. This report will be cited as Report of the Beaver Subcommittee (RBS, 2008). These documents show

Table 2 Documents and meeting materials analyzed

Item Analyzed	Date	Creator	Length
Alhambra Creek Beaver Dam Report (ACBDR)	November 7, 2007	Martinez City Staff	9 pages
November Meeting (NM) Recording	November 7, 2007	City of Martinez	2 hours 55 minutes
Report of the Beaver Subcommittee (RBS)	April 16, 2008	Beaver Subcommittee	56 pages
April Meeting (AM) Recording	April 16, 2008	City of Martinez	2 hours 45 minutes

how the public involvement in discussion of alternative beaver management options revealed solutions that had not been considered previously and brought in new information to light around options that had previously been considered infeasible.

In addition to the reports, there were two City Council Meetings where the city's beaver management was a primary topic of discussion and comment, both of which were heavily attended by residents supporting coexistence with the beavers. The November meeting had 51 public commenters with 1 hour and 48 minutes of public comment and the April meeting had 23 public commenters with 59 minutes of public comment. Both meetings were recorded and made publicly available online, so I reviewed them, downloaded and transcribed them, first using Otter.ai then cleaning the generated transcript of errors. While I also draw on what was said by councilmembers and staff, public comments are my primary source of analysis of the meetings. I numbered each public comment chronologically during transcription, and when citing public comments in this thesis, I will include which meeting the comment was said at, either November meeting (NM) or April meeting (AM), the number of the commenter, and, if quoted directly, the time in the recording at which the comment was said (e.g., an exact quote from the 21st commenter at the November meeting would be cited as NM-21, 1:31:55).

Participant Observation

Participant observation is a method in which researchers embed themselves within the phenomenon or group being studied. From this position, researchers are able to get a more firsthand understanding of the research subject. While conducting my research I

was able to serve on the steering committee for the 2021 California Beaver Summit, which was chaired by Heidi Perryman, a beaver activist that became fascinated with beavers as a result of the events surrounding the Martinez Beavers. Through this position I was able to see the ways in which the activism started with the Martinez Beavers and is continuing to impact the discussion surrounding beaver management in California and beyond.

Thematic coding Analysis

Thematic coding is a qualitative data analysis tool that looks for emergent themes that become categories for analysis (Fereday & Muir-Cochrane, 2006) and is a means of abstracting the data from something specific to the case study to a more broadly applicable concept (Martin & Turner, 1986). Thematic coding of documents, public meetings, and interviews is my primary method of analysis. While conducting interviews and cleaning transcripts, I took note of common themes, ideas and motifs that were present in the documents, meetings, and interviews and used these commonalities to develop thematic codes that are intrinsic to the data. I also developed extrinsic codes that connect the Martinez case study to several bodies of relevant literature. I developed 63 codes which fell into five broad categories: place/time based, reasons to keep or remove beavers, lasting impacts, grassroots, and misc./extrinsic (See Appendix C).

I coded my data by printing an item to be coded, coding by hand with highlighters and written notes, then once the document was coded, I physically cut up the document and arranged it according to the codes assigned to each section. Each document was

assigned a document number that will be written on each cut section to be able to continue to discern which document the sections came from. Additionally, during coding I compiled quotes that were particularly interesting, representative, or explanatory for future use as embedded quotes.

ANALYSIS

My analysis is broken up into three primary sections: (1) Pre-beaver place-narratives of Martinez, which describes significant characteristics of Martinez that impacted the beaver management decision; (2) Challenging a management paradigm, which examines the process by which Martinez came to coexist with the beavers; and (3) Impacts of the Martinez beavers, which looks at the impacts that coexistence with beavers in Martinez has made on the city and beyond.

Pre-beaver Place-narratives of Martinez

Two narratives of the place of Martinez emerged from the interviews, public meetings, and documents I reviewed: Martinez as an ‘environmental oil refinery town’ and Martinez as a small town in economic distress.

An Environmental Refinery Town

“Martinez is known for John Muir, it’s also known for the refineries, and I think the beavers are much more positive than the refineries” (NM-25, 1:41:10)

Martinez’s historic associations with both John Muir and oil refineries have combined to instill an environmental ethos into the people of Martinez, which played a role in the community response to the beaver situation in the Alhambra Creek.

The Refineries

The refineries are a defining element of the sense of place of Martinez, both as an economic force within the town and as a part of the town's reputation. The refineries have employed many people in Martinez, which has brought money into the town and contributed to the growth of the area (IwC-1, 2020). In addition to the jobs the refineries created, the companies that ran them also contributed to Martinez by providing donations and grants. One interviewee described the importance of the refineries:

The year that John Muir died [1914] Shell Oil created the refinery here. I think like the mentality of the refinery culture—the town grew because of the refinery, so now we've had... years of that culture, and it brought in wealth. It brought in workers, it brought money, but also money that they donated back to the community. You know there's a big community center and they give awards to the community for certain things. They fund the schools and have grants that are specifically for Martinez schools (CM-5, 2020).

In total six interviewees discussed the refineries as a significant part of the identity of the town (CM-4, 2020; IwC-5, 2020; IwC-4, 2020; IwC-1, 2020; CM-5, 2020; CM-3, 2020), however, public commenters at the November City Council as well as several interviewees indicated that not everyone in Martinez appreciated the association with the refineries. All three of the commenters at the November meeting who discussed the refineries talked about them in the context of not wanting to be known for the refineries. As one said, "We don't want to be known as a refinery town that kills beavers, right?" (NM-9, 1:05:35) Interviews indicate that this discontent with the double environmental negative image of both being home to refineries and being a place that kills beavers. The imagery of being a refinery town spurred people to take action to protect the environment. As an interviewee explained,

There's an interesting, if you're paying attention, competition in this town, but the people, like the people who work at the refinery aren't against the people who are working on the environment. Like there's not a people to people fight, its more... idealistic. There's a lot of people that receive the money or work at Shell, will also be the ones that are doing, you know, the service on John Muir Earth Day (CM-5, 2020).

Another interviewee was an example of this dichotomy of ideals, as he worked for Shell for most of his working life, but was also heavily involved in environmental groups and activism in Martinez (IwC-5, 2020). The public comment opening this section indicates that the push for environmentalism in Martinez may, in part, come out of a desire not to be defined by the negative environmental stigma that comes with the refineries.

The Hometown of John Muir

Analysis of interviews and public meetings suggest that John Muir has had a significant impact on the sense of place of Martinez and contributed to both the environmental consciousness of those that live in Martinez and the decision to coexist with the beavers.

Both the institutions in— and people of Martinez take pride in being the adopted hometown of John Muir, as shown by the many things named after Muir. Seven interviewees mentioned various things in Martinez named after Muir, including the John Muir Elementary School, John Muir National Historic Site and associated Muir House, John Muir Land Trust, John Muir Association, and the John Muir Earth Day Birthday celebration. Additional research also revealed that Martinez also has a street and park named after Muir as well.

In addition to Muir being present on the landscape, he is also present in the minds of people in Martinez. One lifelong resident who I interviewed discussed going to the Muir House on field trips when growing up (IwC-4, 2020); and follow up with staff at the John Muir National Historic Site confirmed that the site still coordinates field trips with local elementary schools as well as offering internship and employment opportunities to high schoolers (Starling, T. Personal communication, 2019). Another interviewee who grew up in Martinez recounted experiences growing up near John Muir's grave: "I grew up next to John Muir's grave. Not that I danced on his grave. I played on it. It's the little tiny grave site family plot that's about a mile south of the John Muir home. Mm hmm. And so that was kind of how I figured out who John Muir was" (IwC-1, 2020). People in Martinez became familiar with Muir from a young age, with many coming to see him as a local heroic figure. A commenter at the November meeting put it, "John Muir is known around the world. I think living here in his hometown we have no idea just how famous he is" (NM-8, 1:04:00). The recent review of Muir's philosophy of land preservation and exclusion of Indians was seen by one interviewee as an attempt "to kill John Muir's legacy," which the commenter went on to defend (CM-3, 2020). This example indicates the importance of Muir's legacy and a resistance to reconsider it in some people in Martinez, further supporting his position as a local hero. Muir's place as a local hero is supported by the five public comments at the November meeting that referenced Muir as a significant figure in the town (NM-9, 22, 26, 30, 38).

Interviews and public comments indicate that the image of Muir as a local hero contributed to the environmental consciousness of people in Martinez and subsequently

the decision to coexist with the beavers. One interviewee credited Muir's legacy for the abundance of open spaces in Martinez:

I've heard that in Contra Costa County, that the number of acres of open space for our county have been preserved by East Bay Regional parks is on the higher end of more urban counties...So people are still trying to accumulate open space here. And that's, that started in Martinez; that kind of consciousness grew out of this town, but I think it was because John Muir lived here. Like he raised his kids here, he married a woman who grew up here (CM-5, 2020).

Six interviewees credited the city's connection to Muir with the decision to coexist with beavers, three of whom were beaver experts and advocates that were not from Martinez but were familiar with the case (BE-1, 2020; BE-2, 2020; BE-3, 2020). Perryman talked about how childhood exposure to Muir contributed to the events around the beavers: "The John Muir thing was not unrelated [to the Martinez beavers], because, you know, we all grew up in a town where we'd go to the John Muir house for field trips. It was definitely in the back of our minds." Councilmember DeLaney saw Muir's influence as a factor in the decision to coexist and Councilmember Ross discussed how he had used the city's status as Muir's hometown as a reason to coexist: "I was taking the attack that hey, you know, we're the hometown of John Muir. What does that say about us? There's other ways than killing the beavers, we're the hometown of John Muir. That's not really a good idea." Four Public comments at the November meeting appealed to Muir as a reason to coexist with the beavers. One commenter talked about the negative imagery of Muir's hometown killing beavers: "Surely the hometown of John Muir to come up with a better solution" (NM-8, 1:04:05), another drew on the spirit of Muir: "I think this [coexisting] shows creativity, that it shows the spirit of John Muir, and we can

do better as a city here. I think we ought to keep the beavers” (NM-21, 1:32:45), while a third drew on the idea that coexisting with the beavers would be acting in the legacy of John Muir (MN-31, 2020).

Muir’s legacy has become controversial as people have come to recognize some of his writings and commentary as racist and ignorant. Currently, for example, the Sierra Club, which was founded by Muir, is reckoning with his views on conservation and the ongoing role that Native Peoples have had in managing the North American Landscape. This is happening in recognition of the role of Indigenous Peoples in cultivating the apparent wilderness that Muir wished to preserve by driving Indigenous populations off the lands that they had occupied and tended for thousands of years. The Martinez case study shows the continued impact of Muir’s legacy by demonstrating how his ideas around conservation continue to shape views of what conservation is and how it should be practiced.

Continuing Environmental Ethos

Interviews suggest that many people in Martinez have historically held environmentalism as an important value and continue to do so today. Four interviewees mentioned past conflict in Martinez over questions of development and redevelopment (to be discussed in greater detail in a later section) as an example of the town’s environmental attitude, saying that there had been 50 years of conflict with those that fought development, doing so to preserve open and natural spaces (IwC-4, 2020; IwC-1, 2020; CM-5, 2020; STR-3, 2020). One of the commenters at the November meeting discussed restoring rather than developing marshlands near the mouth of the Alhambra

Creek (NM-42), indicating that these battles over development were still ongoing. The impression of Martinez as an environmentally conscious place was further supported in my interviews by people talking about their involvement with local environmental groups, such as the Friends of Alhambra Creek (IwC-5, 2020), the community engagement with the Environmental Studies Academy (CM-5, 2020; CM-2, 2020), a high school alternative focused on project based environmental work, as well as independent actions such as removing tires and other debris from the Alhambra Creek (CM-4, 2020; CM-3, 2020). While my interviewees were predisposed to being interested in nature based on their involvement with beavers, the abundance of environmental activism in the city goes beyond mere selection bias. As one interviewee said, “I think the Martinez community, and I’m sure it’s the same everywhere, but there are a lot of people who value open spaces, habitat, you know, nature I guess, so when the beavers moved in, there was strong community support” (IwC-2, 2020). Another interviewee talked about his interest in wildlife, saying, “I’m pro-wildlife. I would give up an elderly jogger any day to have mountain lions around here.... We’ve always had flocks of wild turkeys trotting through town... and I’ve got film of deer, nice big deer, running right through town” (CM-3, 2020). This joke about mountain lions and general interest in wildlife is representative of how many people in Martinez value the existence of wildlife, not just for its direct usefulness, but for its existence, which may have played a role in why so many in the city came to embrace the Martinez Beavers.

A Small Town in Economic Distress

Martinez residents described Martinez as having a small town feel with an engaged population, particularly when an issue attracted public attention, such as the Martinez Beavers. They further described the struggles to maintain that small town feel by resisting development, however this resistance to development, in conjunction with the flooding of the downtown, led to economic stagnation in the area. There had long been discussion of how to solve the economic stagnation of the downtown area, and some took the advent of the beavers as a potential solution for the economic distress the town had been experiencing.

A Small Town Feel

Analysis of interviews and public comments indicate that people in Martinez take pride in the small-town sense of place as well as connections to the city's history. Interviewees discussed the history of Martinez as a factor shaping the small-town sense of place. One longtime resident discussed the history of the town: "At one time Martinez was kind of the center of Contra Costa County, being [the] county seat. The bridges weren't here, the freeways weren't here. You had to go through Martinez to get on the ferry to go to the other side [of the Carquinez Strait]" (IwC-5, 2020). Another interviewee described a different part of the town's history: "The downtown area is pretty small and separate from the outskirts of Martinez. It's an old fishing village, so it's got a pier and used to have a very prominent marina life with fish and fishermen and canning" (STR-2, 2020). The history and age of the downtown contributed to the sense of place as described by another interviewee, describing the town as, "...A boutique kind of town in

the Bay Area, small and quaint, especially where the beavers were down in the old part of town there. It's really kind of unique... downtown older areas" (STR-1, 2020). A downtown business owner described the downtown as being very connected, saying, "It's a small town and the downtown merchants are all tight together... [Owning a downtown business] I've gotten to know the mayor and the city council.... It's a small-town atmosphere" (CM-3, 2020). The sense of place of downtown Martinez is relevant to the Martinez beavers because it is where the beavers settled.

Interviews suggest that the small-town sense of place in Martinez was maintained in part by transferring it between generations. A younger interviewee described her experience of the feel of the area, explaining "I think a lot of the elder community in Martinez grew up with this very small-town vibe, and now that it's grown a little bit, they're trying to instill that in the next generation, and it's worked. I think we just have a lot of pride in our town" (CM-2, 2020). Another interviewee discussed being a local scout leader and integrating the experiences and expertise of older community members into scout activities (CM-3, 2020), which further shows how the sense of place is passed from one generation to the next.

Small-Town Politics

In keeping with its small-town feel, interviewees indicated Martinez also had a small-town political dynamic. The reporter that covered the beavers described some of the small town political and socio-economic dynamics as follows:

There are these old families in Martinez and so much of the political invective in Martinez has to do with what side of the trestle [local railway bridge] you live on,

how many generations your family has been there, whether you're a true, you know, Martinez resident or not. It's very small-town politics (STR-3).

The intergenerational accumulation of power also impacted Martinez politics with those that gained power having a greater influence in local politics. As Councilmember DeLaney put it, "The bigger fish can have a louder voice in a small pond (IwC-6, 2020)," meaning that individual people and personalities can play a larger role in the discussion on the local scale. The discussion around the Martinez Beavers provided an excellent example of the way influential individuals could play a significant role in local politics. At both city council meetings, public commenters expressed feelings that the city staff and councilors were not working in the interests of those they were supposed to represent. At the November 7 meeting, seven commenters expressed feelings that the councilors were not adequately representing their interests. As one commenter put it, "The bridges that I see at risk are the ones that need to be built between the people and up here [points to city council and staff]. Those are the bridges at risk, not the ones downtown" (NM-40, 2:15:35). Other commenters expressed concern over campaign donors having an undue say in the outcome, such as the 46th commenter who said, "I'd like to know... that it's not true, Mr. Mayor, that you're now going to pay back your major campaign contributors, such as Busby, Turnbaugh, and the rest of them and vote in their favor instead of voting in favor of the people of Martinez" (NM-46, 2:25:30).

Similar themes came up in my interviews as well. As one interviewee put it:

I think quite a bit of downtown property is owned by just, you know, three or maybe two or three or four individuals and they have, I think, and undue influence on the City Council. The mayor is a real estate person and one of the city council members is in insurance and so they're interested in appeasing property owners

and promoting development and so I think those few property owners have an undue influence on the city council. They certainly have the ear of the mayor and the council members (CM-4, 2020).

This feeling that campaign contributors had an undue amount of influence over the city Council's decisions were also expressed by Councilmember Mark Ross, who talked about his experience of pressure from one of his campaign contributors, Earl Dunivan, and the pressure he exerted on those that rented properties he owned:

...he's the biggest property owner downtown and when I first started, [he] had contributed money to my campaign and gotten others to contribute... If you had his blessing, you could count on... maybe about a quarter of what you needed at a minimum.... I eventually told him... I don't want any money... because it was coming at a price. Before every council meeting, I'd be getting a phone call or knock on the door of my office.... I just learned to just not answer the phone and not be at my office before council meetings... Most of those people [city councilors] are like one hundred percent fealty; I was like, I'm eighty percent there with you.... They [downtown business owners] were mostly following Earl's lead because he owned the buildings they were in, and that had a lot to do with some of the backbone of the anti-beaver movement were businesses owners who happened to rent from this one guy.... he doesn't forget and he will let you know that he's going to seek revenge upon you (IwC-1, 2020).

Ross's candid discussion of the power dynamics in Martinez politics helps to explain the division lines of the conflict around the beavers. At the April 16, 2008 meeting another public commenter who was a regular speaker during public comment directly named Donovan as the primary force pushing for removal, saying, "Donovan's property is the key issue here. I think if you guys could ... make sure that Donovan's property is protected, I don't think we would have... anything negative against the beavers again" (AM-12). These comments indicate that specific property owners had a disproportionate role in pressuring the city to act against the beavers.

Business Troubles in a Small Town

The small-town feel that many people valued was not enough to attract people to Martinez. The primary draw to Martinez was related to its status as the county seat. As one interviewee explained, “Martinez is a county seat, they have quite a bit of business at noon, when the county workers go out to lunch. In the evenings, it used to tend to be sort of a ghost town, not much going on down there. And a lot of homeless, and not really a particularly inviting environment” (IwC-5, 2020). Another commenter talked about how Martinez had low traffic in the evenings and weekends: “It’s a busy bustling town during the day, but that shuts down at 5pm. There was actually a Jeopardy [question] about it, which is, ‘What is the only Starbucks in the United States that closes after 5 pm and on the weekends?’ And its Martinez California because there just wasn’t enough traffic” (STR-3, 2020).

The flooding of The Alhambra Creek, discussed in greater detail in a later section, was another factor that discouraged new people and businesses from settling in Martinez. The downtown would be flooded about every other year, which, in addition to the lower levels of development, lead to economic stagnation (IwC-1, 2020), particularly in comparison to the surrounding cities. As explained by one interviewee:

This [Martinez] was kind of the center of the Universe, a little micro-universe if you will, and we’re no longer that, we’re almost like a little-by water because Walnut Creek now has most of the cool restaurants and all the business activity. They’re putting up tall buildings in Concord... Concord is now the biggest city and Martinez still has about 35,000 and we’re limited by our geography and also by our decision not to expand (IwC-5, 2020).

Redevelopment was an oft debated option for revitalizing the downtown area of the city, but this option was very polarizing, as discussed by Councilmember Ross, saying, “The first question was always are you for or against redevelopment. If you’re against it, you had a community that would literally want you to be dead, and the feelings were the other way around” (IwC-1, 2020). The resistance to redevelopment was in part out of concern of losing the small-town identity that many people valued, as said by an interviewee:

There was a small-town identity that developed that the people here worked really hard to maintain against the suburban movement, which was in our neighboring towns, like Pleasant Hill, and Concord and Walnut Creek that became urban sprawl.... It had a very historical Main Street and people fought all the time to keep out big box stores from the main street (CM-5, 2020).

A lifelong resident portrayed the resistance to development as coming from the people and the push for development as coming from the city, saying, “Martinez had resisted a redevelopment agency for 50 years. We just didn’t want it and the city was always pushing and residents were always fighting” (IwC-4, 2020) The assertion that the city governance supported redevelopment was supported by another interviewee who talked about the city manager that was in charge during the events of the Martinez Beavers,

The city manager at the time was the highest paid public employee in the state... he was a person who had revitalized Walnut Creek. So basically, the city had brought him in at this very high price to turn Martinez into Walnut Creek. They wanted nicer, bigger chain businesses, they wanted more, they wanted to revitalize the downtown area (STR-3, 2020).

While redevelopment was the most divisive means discussed of attracting people to Martinez, it was not the only one. As Councilmember Ross explained:

You can find 10 meetings where we talk about Downtown improvement and marketability and we still do... I say the same thing: we just have to pick a direction and go with it. I don't care what direction it is historical, quaintness,

offbeat, retail, beavers, John Muir. Just pick a direction go with it. But what we still do to this day is, we have people say, this is what we should do. Another group that's equally perfect says, no, this is what we should do.... It's confusing, we put out all these different messages. We have an economic development director, we have Mainstreet Martinez, we have the chamber and now we have a fourth entity of the younger business owners that are on Main Street.... They all say, this is how we do it. And it's been an endemic problem, so the beaver promotion kind of falls within that (IwC-1, 2020).

It was into this quagmire of competing ideas of downtown rejuvenation and conflict over redevelopment that the beavers fell into, and, based on analysis of public comments at city council meetings, many saw their advent as yet another means of rejuvenation.

Beavers as a Solution

An analysis of the November and April City Council meetings suggests that many people in Martinez saw the beavers as a means of attracting people to Martinez. Across both meetings, 12 people talked about the beavers as something that would bring people to Martinez (NM-8, 9, 15, 22, 23, 29, 40; AM-16) many with ideas of how to capitalize on the beavers, ranging from building a beaver industry including beaver fur hats and beaver tooth bolo ties (NM-4, 6) to making the city more of a place for nature lovers to view beavers (NM-2, 0:48:30). Three comments directly addressed beavers as a branding opportunity that the city had been looking for:

Our town has been looking for an identity for the last several decades, one that fits our character and meets the needs of business people and residents alike. And Eureka, we found it—nature, history, and recreation (NM-28, 1:48:20).

There's an underlying subtext here... It's about redevelopment... Those of us to believe that we need a destination, a reason to come downtown, that's what we need, and that's exactly what the beavers are inviting. We're not going to build our way out of this with apartments or low cost housing, and that's basically what the issue here. You get rid of the beavers and go on like we're going. I don't believe that's a good idea (NM-21, 1:31:55).

The beavers have succeeded where the City Council... could not. They draw people downtown. What a magnificent gift we've been given. We could use our beavers to promote downtown activities. We could use them to advertise our city as the beaver capital of California. We could use these lovely creatures as an example of how we can cohabitate with nature. We could host the beaver festival promoting Beaver and nature related gifts, arts and crafts, videos, and lifestyle of the beavers and other wildlife, and yes even tee shirts depicting our furry friends... Capitalize on the beaver been here to make Martinez a destination, a concept this City Council claims to support (NM-13, 1:12:30).

Additionally, two commenters talked about how the beavers had already been drawing people to the downtown area during times people were not often there:

I'm Luigi from 99¢ store. I opened like two years and a half. This stored, first year, night time, I see no business Martinez. I think it's like ghost town, but after beavers come in, my store grows so much. I feel bad for some stores, no[t] come[ing] here, talking to keep beavers here... Nice ingenious man here [gestures to city engineer]; he can have some way to keep beavers over here in town, business can grow more (NM-32, 1:59:50).¹

The beavers are an asset to downtown... and have done more to encourage local tourism than many of the human organized activities in recent years. I took the fliers around about the creek and the Gazette stories to jury duty that I was called to recently. And it took over a week for jury selection and the people were bemoaning the fact they have to spend time in this dead town. I handed those people those fliers and they brought their kids on the weekend because they were so impressed (AM-13, 3:31:51).

These comments show the way that the economic stagnation of the downtown area of Martinez contributed to the decision to coexist with the Martinez Beavers.

Challenging a Management Paradigm

In a way that [coexisting with beavers] was also like paradigm shifting. Because you know at first, they're like, well we have to get rid of these creatures because they're ruining the trees along the creek and that's why. It's a very old way of looking at land management. And then the more research and the more like this, scientists came from all

¹ This comment is transcribed as it was spoken.

over the world to say, you don't have to do it that way. You know, we can, we can take care of the, our creeks in a way that allows for the biodiversity and manage the community's interaction in the safe way with the Creek. it's not just one or the other.
(CM-5, 2020)

Martinez faced many of the same challenges with their beavers as other places, yet instead of depredate, they decided to coexist, despite CDFG's tendency to use depredate as the main tool for beaver management. This was in-part because many people in Martinez had built connections with the beavers by spending time with them and consequently demanded a greater role in the decision-making process than was usual in wildlife management. Ultimately, this decision to coexist with—rather than depredate—the beavers acted as a challenge to the de facto management paradigm of lethal management that had been the norm in California for nearly a century.

Institutional Bias Towards Depredation

“There weren't many experts at hand or any sort of best practices manual for dealing with beavers” (IwC-6, 2020).

“I don't think that a lot of people were, like, quick to jump to removal because they thought removal because they thought that's what should be done, but I think they thought that that was all that could be done...I don't think that they thought that there was a coexistence option” (CM-2, 2020).

Interviewees said that no one in the city government had had any prior experiences with beaver management, so they relied on institutional guidance for how to deal with beavers. CDFG staff was a primary source of guidance city staff used while attempting to find a beaver management solution that would work for Martinez, which advised depredate as the management solution. The staff report prepared for the November meeting said that CDFG had given two management options: kill the beavers

or do nothing. Three people I interviewed discussed the perception that at the time depredation was the standard management practice. One interviewee talked about how other cities had dealt with beaver by constantly killing them (STR-3, 2020), and another talked about how beavers in remote areas of the county were regularly depredated (CM-4, 2020). These perspectives show how depredation as a management solution was a normal management response at the time and for the area.

The institutional guidance that city staff received indicated that coexistence was not a viable option as the beaver population would expand, causing more beaver related problems in the future and that the coexistence focused alternatives to depredation would not be effective (IwC-4, 2020; AM- M. Tappel). The city staff was aware of coexistence alternatives, such as the flow device the city eventually had installed, as made clear by the response to a question from a public commenter at the November City Council meeting:

...A burning question... I'm going to direct... to the people who work for the city of Martinez: What mindset were you using when you came up with some sort of ideas? Did you guys go on the internet? Did you look at some alternatives to actually—

Yes... we looked at all of these alternatives.

But you didn't present them to the public... It's a very basic question: why did you not present them to the public and only just a few things? None of the alternatives we've brought here today were even brought up... (NM-49, 2:28:50)

It seems that the primary reason why these alternatives were not presented was because the prevailing management strategy at the time was depredation, and the institutions consulted did not believe that these alternatives would be effective. In interviews with

beaver management specialists Skip Lisle and Mike Callahan, both discussed how many management agencies perceived coexistence mechanisms, such as flow devices, as ineffective, largely because managers such as themselves had only perfected such strategies in the late 1990s and early 2000s. Both also discussed how some managers had negative experience with such devices because those that installed them did so poorly, leading to failures, which in turn cause managers to see these strategies as ineffective (BE-1; BE-2, 2020). The advice that depredation was the only solution shows the way that momentum for particular management actions can build within an institution until that option appears to be the only viable option.

Through political maneuvering, city councilmembers were able to secure a special relocation permit from the California Fish and Game Commission. Despite the fact that relocation permits had not been issued in California for nearly 50 years, this option faced pushback from the public. People not only wanted the beaver to remain in Martinez so the public could continue to experience the beavers, but also out of concern that the beavers would not be able to be relocated safely (IwC-4, 2020). Beaver relocation was not something that was regularly done in California, as reflected by Mayor Schroder's use of political capital to influence the CDFG Commission to offer the special relocation option (NM- R. Schroder). As Councilmember Ross said, "They apparently didn't do that too often. They kind of resisted that, but that was the compromise of the moment, to take them up the Sassaume Marshes and give them a new suit, and a hundred bucks and release them" (IwC-1, 2020). During public comment at the November meeting, Perryman voiced concerns over the ability to safely move the beavers, raising the point that

relocation can be dangerous to the animals, which would be all the truer in California, where no one had experience doing so (NM-12). Had the CDFG had more experience with beaver relocations and been able to offer more support, then relocation may have been acceptable in Martinez.

Addressing Challenges Posed by Beavers

The Martinez Beavers posed the same challenges in the Alhambra Creek as beavers posed elsewhere: flooding, vegetation damage, and burrowing. In fact, the long history of flooding in Martinez made flooding a greater concern in this instance than in other cities. The engaged public in Martinez either countered these concerns as not applicable or provided solutions to the concerns.

Flooding

“From what I understand, there was flooding even before the beavers were in evidence” (NM-6, 2020).

The beavers settled in a section of the creek that had been restored as part of the creek restoration project and when they built a dam, some people became concerned about flooding. The long history of flooding in that place made both the city and the downtown business owners particularly wary of anything that could potentially increase the risk of flooding (Figure 6). City staff had also noted that the beaver dam had increased in height from 2006 to 2007 and were concerned that the beavers would continue to raise the dam, further increasing the risk of flooding (ACBDR, 2007). As the report stated,

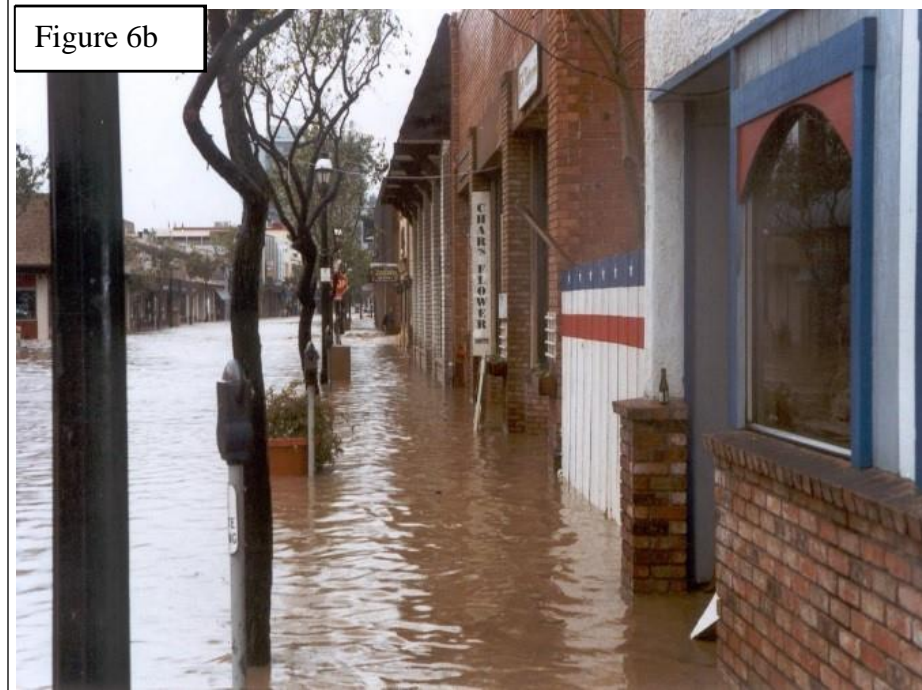
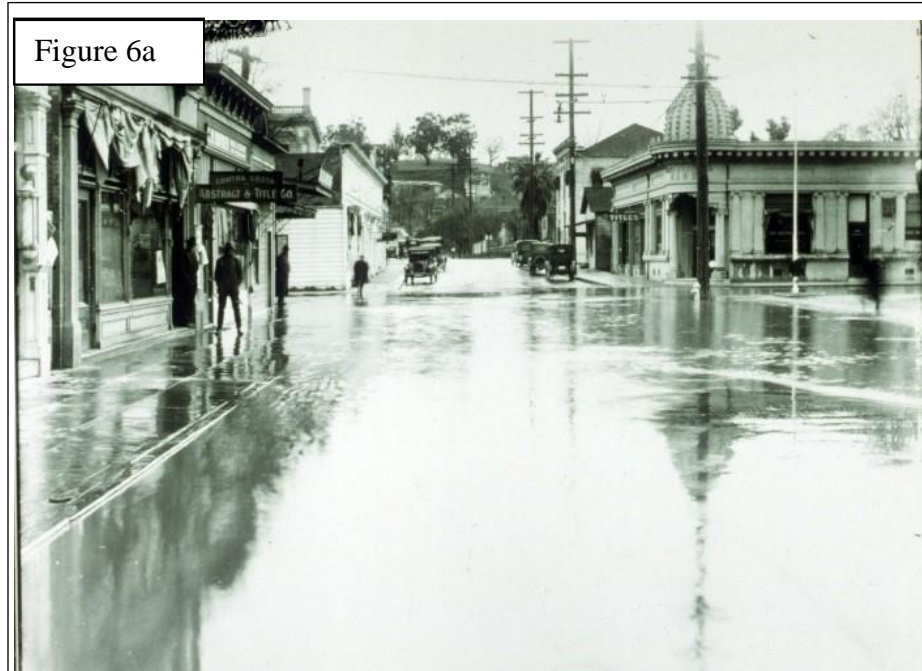


Figure 6 Photos of past floods in Martinez downtown. a. Flood during the 1920s, b Photo was taken during a 1997 flood. Both photos are from the Alhambra Watershed Management Plan: A User's Guide Prepared by the Alhambra Watershed Planning Group. Used with permission of the Contra Costa Resource Conservation District.

Unfortunately, damming Alhambra Creek significantly increases the very strong potential for flooding in the downtown area. This is not good news to residents, property owners and businesses who along with the City and several other governmental agencies have worked hard to mitigate many, many years of flooding... Removal of the dam is essential if the City of Martinez is to be prepared for winter rains. (ACBDR, 2007)

To assess the dangers of flooding, the city hired a consulting firm, Philip Williams and Associates, to conduct an assessment of the effects of the beaver dam. The generated report stated that the dam, as it was on October 1, 2007, would cause flooding with a five-year storm event, and should the dam be built higher, the flooding interval would be further reduced (ACBDR, 2007). Many people in the community took issue with the report generated by the firm, saying that the firm used a worst-case scenario that was unrealistic. One interviewee said that the report treated the beaver dam as a concrete weir, rather than a dam made of natural materials (IwC-4, 2020). At the November City Council meeting, one person called into question the validity of the report, and said, "I want to directly attack this hydrology report... All the computer stuff that you did is all based on the... highest twig on that dam and everything else flows from there, as if that's the way its going to be at all times. That's just bogus" (NM-21, 1:31:00). Three additional commenters discussed how the report failed to account for the likely event that the dam would be washed out during a food event. As another commenter said, "I know the force of that water when it comes down through there, it is literally like a freight train roaring through there... Nothing could stand in the way of that thing" (NM-18, 1:22:20).

Interviewees supported the idea that the dam was breached by high flows. The day after Skip Lisle had installed the flow device, high flows both dislodged the flow

device, prompting Lisle to reinforce the device the next day, and breached the dam (BE-1, 2020; IwC-1, 2020). At the April City Council Meeting, beaver subcommittee member Julian Frazer stated that the dam had washed out any time that there had been more than a half inch of rain over a 24-hour period (AM- J. Frazer, 2:09:30) and Mark Ross, in an interview, also discussed how the dam was blown out during about half of the high flows the creek experienced (IwC-1, 2020).

Concerns around flooding were major themes at both the November and April city council meetings and in my interviews. At the November city council meeting, both commenters who were advocating for beaver removal cited flooding as a reason to remove the beavers, with 11 commenters discussing flooding. One commenter who was pushing for neither coexistence nor removal wanted to discuss the trauma caused by past flood events.

We worked 10-15 hours a day for several weeks trying to help people that were flooded out. No matter what we did, we tried to help them and be there for them, but you can never erase the trauma of a devastation.... That creek can rise very fast and you need to consider all that and the people (NM-17, 1:20:50).

Eleven out of the 16 interviews with people with direct Martinez experience discussed flooding as a concern. Past experiences with flooding was a backdrop that appeared to permeate discussion and decision-making around the beaver issues.

Many of the speakers in favor of coexistence acknowledged the town's history of flooding and discussed ways of avoiding flooding issues. One option discussed was being prepared to remove the dam in short notice in the event that the dam was not washed out during high flows. One man talked about how a fireman claimed to be able to quickly

remove the dam: “I was talking with a fireman down at the dam today and... he said if there was a problem with the dam, he could be there in five minutes and blow that dam out with his water cannon, if you need to” (NM-11, 1:08:10). Another commenter talked about attaching cables at different heights on the dam to remove as much as would be needed to avert flooding. In addition to these last-minute solutions, six commenters discussed pond levelers as a way of reducing the risk of flooding by reducing the amount of water impounded by the dam and discouraging the beavers from building the dam higher.

Interviewees and public meeting comments suggests that flooding was an even greater concern in Martinez because of the city’s history with flooding, with people on both sides of the conflict acknowledging the impacts that flooding has had in the city. Given this background of flooding, it is all the more significant that the city decided to move towards coexistence with the beavers.

Burrowing

In addition to the flooding, the property owner adjacent to the beaver dam was concerned that beaver burrowing into the bank would destabilize his property. City staff found that beavers have the capacity to excavate large living areas up to 60 feet from the water’s edge, and because there were buildings and infrastructure within 60 feet of the dam site, the beaver burrowing posed a threat (ACBDR, 2007). The report generated by the beaver subcommittee indicated that there was no evidence of burrowing by beavers at the dam site and that any burrows being dug were likely done by other rodents, as indicated by the small hole diameters (RBS, 2008). In addition, Skip Lisle wrote a letter which was

included in the report indicating that he had not seen evidence of beaver burrowing while installing the flow device (RBS, 2008).

Vegetation Damage

While vegetation damage was not an issue that received much attention at either of the City Council meetings, staff reports and several of my interviewees mentioned the damage to vegetation planted as part of the creek restoration project as a concern around beaver coexistence. The city staff report generated for the November meeting mentions that reduced vegetation could lead to bank destabilization (ACBDR, 2007), however the beaver subcommittee report and comments at the November meeting contradict this idea, stating that beavers leave tree's root systems intact by cutting trees above the root line, which then encourages additional vegetative growth (RBS, 2008). Additionally, one interviewee mentioned concerns over the aesthetics of damaged vegetation in the downtown area: "Cutting trees down is... [a] community design issue because you have a downtown area and a plaza and other features that...people have some aesthetic expectations [of]. From a community design perspective and having this beaver come in and wipe it all out... might be startling to some people" (IwC-2, 2020). Both the concern that removed trees would lead to bank stabilization and the aesthetics of removed vegetation reflect concerns over appearances, showing once again how the beavers settling in a place that had recently been improved and places that should appear a certain way spurred concerns over beaver damages.

Costs of Coexistence

The costs of keeping the beavers were an additional factor that were mentioned by six interviewees and was a major topic discussed at the April City Council meeting (CM-1; STR-3; IwC-4; IwC-5; IwC-6; STR-2, 2020). At the April city council meeting, one commenter brought up that downtown property owners were still paying off the bond for the creek improvement and that implementing additional flood protection measures would add additional costs. He also commented that the city's spending was already over budget (AM-3). The cost of creek improvement project were part of the pragmatic argument for beaver removal, as explained in my interview with the newspaper reporter that covered the story, "The thing that makes the most sense is to kill the beavers because then you don't exacerbate the flooding problem in an already very problematic flooded area that you had spent millions of dollars trying to address" (STR-3, 2020). One of my interviewees elaborated on the flood control measures the beaver subcommittee had proposed, saying, "We came up with a proposal to do some fairly modest things in downtown to increase the flood protection for the property owners. It was gonna cost less than \$100,000" (IwC-5, 2020). This interviewee went on to explain that these improvements would be beneficial to the downtown, regardless of the presence of the beavers. Another interviewee explained the fears about the costs of coexisting with the beavers:

[The city implemented the creek improvement project and] now the beavers are going to cost the city of Martinez a half a million dollars. So there was a lot of negative attention in that respect. ... So yeah, it was just it was a financial cost... people were saying, you know, how in the world are we going to spend this kind

of money for this, there are so many other things that need to be, you know, paid attention to (CM-1, 2020).

These interviews and comments indicate that the concern of costs associated with the beavers were related to the recently improved place that the beavers settled in in Martinez. It did cost the city to coexist with the beavers, however the costs that were outlined in the April Meeting Report were not specific to the beavers and were recommended as beneficial to reduce flooding, regardless of the presence of the beavers.

Building Connection with The Beavers

Interviews suggest that people in Martinez built connections with the beavers by spending time in close proximity to them during observation and through the media coverage.

Spending time with and Photographing the Beavers

Interviews with locals familiar with the watershed indicate that beavers were an unusual sight in the Alhambra Creek (CM-4; IwC-5, 2020), so when the beavers appeared, their novelty attracted people. One interviewee discussed feeling surprised when they first heard about the beavers (IwC-5, 2020) while another expressed incredulity that there were actually beavers in the creek (IwC-4, 2020). Interviews suggest that people were enamored with the rodents when they first saw them. Two interviewees mentioned immediately wanting to take pictures of the beavers upon seeing them (IwC-4, 2020; CM-4, 2020) while another talked about a strong feeling of discovery: “I felt like I was a three- or four-year-old child discovering something for the first time. I just loved it” (CM-7, 2020).

Both interviews and public comments suggest that many people in Martinez were attracted to beavers for more than the novelty factor and regularly spent time at the dam site. One interviewee who was a child when the beaver arrived recalled visiting the beavers: “I do remember visiting the beavers a lot with my mom.... And it just being like, really wholesome and good... We would drive down and look at them, just look at them swimming around. And like, you know, we would see that there would be like, regulars that would be there” (CM-6, 2020). Two other interviewees discussed incorporating morning beaver viewings into their routines, visiting the dam site and watching the beavers in the mornings (IwC-4; CM-1, 2020). One of these interviewees also mentioned spending time at the dam site to protect the beavers, ensuring that people were not feeding the beavers stuff that beavers shouldn’t eat (CM-7, 2020). At the November meeting, five commenters discussed regularly viewing the beavers, with several talking about how others would often be there viewing the beavers as well (NM-20, 24, 28, 33, 40). This time observing the beavers in close proximity contributed to the connections that people felt with the beavers.

People also came to appreciate the beavers for the habitat that they created for other species. Commenters at the November meeting, interviewees, and in the Beaver Subcommittee’s report. At least three people at the November meeting spoke of appreciating the increased abundance of wildlife at the beaver ponds (NM-13, 28). One commentor said, “They’ve contributed a lot of wildlife. We’ve got the [unintelligible] duck, river otter, muskrat, egret, heron, turtles. That’s a lot of wildlife that were never here before” (NM-20, 1:28:15). Interviewees and the subcommittee’s report discussed a

similar array of wildlife at the pond as the above comment a similar array of wildlife at the pond (BSR, 2008; IwC-4; CM-4, 2020).

People in Martinez further created connections with the beavers by generating their own narratives around the beavers. As one interviewee said,

People felt their own sense of responsibility for the beavers, like they explained what they saw based on their own set of reasons and explanations... The fact that everyone felt personal ownership of the beavers is what made them live. Everyone felt... personally engaged. They came up with a name for the beavers when they were watching them (IwC-4).

This sense of responsibility for the beavers was evident in the comments of one community member at the November meeting who had named the beavers Bucky and Betty and discussed the need for the community to take responsibility for the beavers (NM-27). Other commenters talked about how they had learned about beaver habits by watching the beavers (NM-20), which also supports the supposition that people would create their own stories about the beavers through observations.

Media expanding interest in Beavers

Interviews suggest that media exposure, both traditional forms such as print and television news and new forms such as YouTube and social media played a role in the connection that people built with the beavers. Four interviewees discussed how they or others first learned about the beavers because of the media coverage they received. The reporter covering the story for the local paper described the story as initially a charming, local public interest story that grew as city officials began discussing depredation, then snowballed as other news outlets around the Bay Area took up the story (STR-3, 2020).

Skip Lisle described the attention the media paid to his work as highly unusual: “The biggest thing that set that [Martinez] apart is the press. I mean, every news outlet in San Francisco was there... I was just breaching a dam with a with a hand tool, a cultivator, and there's helicopters flying around and these vans from all the TV stations, it was so crazy” (BE-1, 2020). In addition to the traditional media outlets that paid attention to the beavers, the Martinez Beaver also became sensations on YouTube when Perryman posted videos to the site. As she explained, “I filmed the first beaver and I put the video on YouTube... I used to get awards from YouTube, saying I had the most watched animal video of the day... And so, people in town started watching these videos because they wanted to see the beavers and I could see them more often in the morning than they would see them at night” (IwC-4, 2020). Both the news stories and internet videos helped to draw attention to the Martinez Beavers and bolster their position as local celebrities.

Public Role in Decision Making

The public was involved in the decision-making process through grassroots organizing and through institutional channels.

Grassroots Engagement

Perhaps the most visible grassroots engagement around the beaver was the candlelight vigil that was held in support of the beavers before the November meeting. Four interviewees discussed the vigil as a significant event (IwC-2, STR-3, IwC-4, StR-2, 2020)). One interviewee discussed the vigil as a significant way that the public put pressure on the city to do something different, saying, “They had a candlelight vigil out there and there was a lot of people holding up candles, you know, on the bridge that was

just by the beaver dam and the TV cameras were out there... I mean it was a huge political issue for the city” (IwC-2, 2020). Two interviewees estimated that 100 people showed up to the vigil, saying “There was a vigil held at the beaver bam and, like, 100 people showed up with candles and did a candlelight vigil for the beavers (IwC-4, 2020)” and “At least 100 people showed up for that vigil (STR-2, 2020). Additionally, one commenter at the November meeting mentioned the vigil as something that had brought attention to the beavers (NM-29). The vigil and attendance at the November meeting were organized by someone that had gained organizing experience through involvement with the Survivors Network of those Abused by Priests. “He knew a lot about engaging the community and talking to the press and getting people involved, so he’s the one that organized the vigil and he’s the one that got a lot of people to that meeting (IwC-3, 2020).

Beyond the vigil, grassroots organized events and activities helped to make more people aware of the discussion around the beavers. One interviewee discussed first learning about the beavers through a save-the-beavers protest (CM-4, 2020), while another mentioned learning of the beavers because of beaver activists had been informing people about and protecting the beavers during an outdoors New Year’s celebration that took place near the beaver dam site (CM-7, 2020).

The grassroots organizations around the beavers began to gather into a group that would eventually become Worth A Dam (WAD), the beaver advocacy group that is based out of Martinez and will be talked about in greater detail in later section. WAD organized those passionate about coexisting with the beavers into a group that could then make use

of skills within the group to advocate for the beavers more effectively. These skills involved the political acumen of an involved city councilmember (IwC-1, 2020), past experience with the media and writing press releases (CM-1, 2020), the artistic and photographic skills of a local artist and a burgeoning photographer (IwC-3, IwC-7, 2020), and prior experience working and engaging with children along with research skills from a child psychologist (IwC-3; CM-1, 2020). The organizing by WAD culminated in the beaver festival, which became an annual event celebrating the beavers, and will be discussed in further detail in a later section.

Institutional Engagement

The public in Martinez was able to make its voice heard and influence the decision-making process of what should be done about the beavers by engaging through institutional channels. As one interviewee put it, “The city council allowed for public opinion to determine the pace of the decision making” (CM-5, 2020). The primary ways this was done was through the city council meetings and the beavers subcommittee.

Public Meetings

The two public meetings quoted throughout this document were the most substantial ways that the general public in Martinez made their voices heard during the decision-making process. The unusual public turnout for these meetings was evidenced by the city council’s decision to move the meeting from the city council chambers to the auditorium at the high school, in anticipation of high public turnout. Several interviewees talked about how hundreds of people turned out for the meeting, saying, “The city council meeting to discuss the topic was mobbed by hundreds of beaver lovers that didn't want

the city to destroy the beavers (CM-4, 2020),” while another interviewee said “This meeting was held in a high school auditorium, theater and the place was packed (IwC-1, 2020). The video recording of the meeting further corroborates the large turnout for the meeting. Nine interviewees in total discussed the public meetings as significant places of public engagement (IwC-4, IwC-2, CM-5, CM-1, STR-2, CM-2, IwC-1, IwC-5, CM-7, 2020). One interviewee described the meeting as such:

The first city manager was the one who said, Okay, let's just kill them. You got the depredation permit from fishing game. Then we had that three hour meeting at the high school, where people just said, "Oh, no, you're not." Our city council is pretty good about listening to the public when they show up and they showed up” (CM-1).

As seen in quotations throughout previous sections, the meetings were places where the public could communicate their opinions on options considered as well as to provide other potential solutions. The public meetings also served as a place at which supporters of the beavers were able to connect with each other, which helped to further grassroots organizing. As explained by an interviewee, “Attending public meetings was crucial, then I started to have a dialogue with Heidi Perryman, because she seemed to be trying to put something together. And that something would eventually turn into Worth a Dam” (CM-1, 2020).

At the April meeting, the beaver subcommittee was able to present on the reports about the possibilities it had discovered through its process, presenting information in favor of removal and coexistence. This process allowed people from both sides to at least feel like their positions had been considered.

One thing asked for at the November meeting was for further public involvement in the decision-making process: “I think you should consider having a study group with participation of a lot of people here... and I think that should be done before you do any move about getting rid of the beavers” (NM-25, 1:41:50). The council agreed to this sort of involvement, resulting in the creation of the beaver subcommittee.

Beaver Subcommittee

The Beaver Subcommittee was composed of city officials, interested community members, and local experts and provided an opportunity for the committee members and any interested members of the public to learn more about beavers and further explore options. One committee member described the role of the committee as such:

“Our job was to consider several areas, including flooding and populations and water quality and cost, and liability. Those were the issues that the city was concerned with...so we were supposed to consider those and talk about those and address those” (IwC-4, 2020). Another subcommittee member described a lot of the role of the committee as learning about beavers, saying:

One of the first things that the committee did was they assessed their knowledge base on the issue, which is you know, dealing with beaver so and there was various degrees of expertise on the committee. So one of the objectives early on was to educate everyone on beavers and how they live and what drives them to do what they do and that sort of thing. So we brought in speakers at these meetings to educate the committee members. So the committee members could do their work on the committee with the knowledge base needed (IwC-2, 2020).

An interviewee that wasn't on the committee described the process as “The task force met, the problem was outlined, the cost of possible mitigations were outlined, and a plan was developed as a result. And then that plan was put forward at a larger meeting” (CM-

1, 2020). The subcommittee was an authorized committee, so all the proceedings were open to the public, as described by on interviewee:

The subcommittee was an authorized committee of the Council, so they were public meetings, and they were subject to the Brown Act and everything, so they were advertised, noticed, and very well attended. So, we had, I believe that and there were articles in the paper all the time, So, you know, everybody kind of knew about it, and knew about the subcommittee, and those who want to participate, certainly participated (IwC-2, 2020).

Two other interviewees discussed the ways that the subcommittee had engaged the public in similar ways (IwC-4, 2020), and a commenter at the April meeting indicated that members of the public had remained engaged through the subcommittee process, saying, “All that you have been presented to read in all those technical reports, and boy are those reports a little boring, ‘cause I read them, but they’re informative and you’ve got to do it” (AM-5, 3:26:40). The beaver subcommittee not only provided an opportunity for members of the public to sit on an advisory committee, but also for the public to learn alongside and engage with the advisory committee.

Setting an Alternative Example for Future Generations

At the public meetings, multiple people talked about the example that would be set and the lessons put forth by extirpating the beavers. As one commenter said, “The message we’re giving to the children, and from the people and city of Martinez is that we just want to remove something that is not wanted, and I think that is sad” (NM-46, 2:25:00). While another said, “I think it’s a really lousy lesson to teach our children, that if you got a problem, you don’t work with it, you don’t solve it, you just get rid of it (NM-33, 2:02:15),” and yet a third said, “When we decide not to live in harmony and our

first choice is to get rid of the problem, I think we're teaching the whole community that if you don't like it, just to have it removed, and I think that's a bad lesson for our children and the community" (NM-16, 1:19:25). All of these comments imply that the predominant lethal management approach represents a method of problem solving that uses drastic options to remove the problem, rather than treating the problem as a puzzle to be solved. These different approaches to problem solving reflect different relationships with the natural world, with the former representing the idea that nature is something external and separate from human civilization that should be removed when inconvenient whereas the latter represents an approach that treats humanity as a part of the natural world that must learn to coexist with the other parts. These comments reflect the desire for an approach to problem solving that looks for solutions that are amenable to all involved in the potential conflict, even the wildlife that is incapable of being aware that their actions are causing conflict. This alternative approach to problem solving serves as a significant challenge to the trapping-focused management paradigm that had held primacy at the time of the events, thus placing Martinez's coexistence approach a challenge to the dominant management paradigm.

Youth Engagement

All three of the above comments also reference children and youth as a primary audience for whom the city is setting an example through their management decisions. This attention to the youth came to be a cornerstone of support for the Martinez Beavers, as city councilmembers came to be concerned about of the public backlash of killing a charismatic animal to which many children had become attached. Activists also discussed

ways in which children engaged with the beavers through both arts, discussed further in latter sections, and education.

Three interviewees directly discussed the role of children in the political decision making. An interviewed beaver expert said, “It’s kind of easy to see why it’s easy for folks to get behind it [beavers]. Being very cute and you have kids involved and your like, Oh my god... To Heidi’s credit, she definitely engaged the kids fully, making it harder to ignore the beavers (BE-3, 2020). Two other interviewees also discussed children exerting political pressure for coexistence with the beavers. As those involved in organizing support described having the epiphany to involve kids during one of the city council meetings, “It all kind of clicked up here and I said I know, I’m gonna get the kids involved. How is the town going to turn the kids down? (CM-7, 2020)” An interviewed city council member also discussed the role that children played in the decision-making process:

You’re gonna kill the beaver, then you’re gonna have crying kids. I mean the first thing I said was your gonna turn every kid in town and you’re gonna have them crying, which is a political response, not a humanitarian one. To your political colleagues it kind of like, ‘you really want to have all the kids crying in town, huh?’ So, I think everybody played their role (IwC-1, 2020).

In discussion of the political forces that made an impact in the decision to coexist, the same activist previously quoted said,

It [pressure for beaver coexistence] also made the city councilmembers and the leadership of Martinez realize you can’t push the little guys around. And I’m talking about kids here who don’t even have a vote. This was kid power... I think if we didn’t have families and school system so involved in this, I don’t think we would have gotten as far as we got (CM-7, 2020)

Collectively, these responses allude to the important role that the youth played in pressuring the political apparatuses to coexist.

Analysis of interviews and meetings indicate that arts and crafts, discussed in greater detail later, along with education were significant means by which activists involved the youth. Five of my interviews, from a range of background as youth, educators, and community members discussed how children engaged beavers through education. A community member discussed how children were involved, stating “That [the beaver deceiver] was a big project. We talked to kids about that. We had pictures of it and showed them how it worked. You know, so, I mean these children got a lot of education as far as even through their classroom teachers coming down and doing field trips down there (CM-7, 2020). Interviewees with those associated with the schools similarly explained how children were exposed to beavers through schools; as the superintendent said, “I know a lot of our classes did a lot of things, wrote letters to the editor about saving the beavers.... I do believe they took some field trips... I know they did posters and things like that about the beavers” (STR-1, 2020). One interviewee who would have been in elementary school during these events recalled,

I remember someone coming to my school. I was in third grade... I don't remember the details..., but I'm pretty sure... there was something about the beavers, so this is when I learned about the beavers in town, and that they were planning on like, exterminating them.... My mom tells me I was very upset about this and she says that she suggested to write a letter to the council people because I was going off about this (CM-6, 2020).

Additionally, older youths were interested in engaging and assisting with the Martinez Beavers, as evidenced by the final commenter at the November city council meeting who was a high school student who said,

I go here and I was thinking, if we do keep the beavers, as I'd love... I went to coast cleanups, and I mean we could do a coast cleanup down there. Keep them clean, keep the whole area clean. Because there's plenty of kids right here at Alhambra High willing to do it and I'm in junior high willing to do it NM-51, 2:32:15).

This emphasizes the way that students had taken an interest in the Martinez beavers and advocated for them.

In addition to the regular classrooms, the Environmental Studies Academy (ESA), a project based high school alternative education program, embraced the beavers. A former ESA student who attended during the events of the Martinez beavers discussed their involvement with the beavers as such:

There's a guy named Igor, who was pretty involved with ESA. And I believe that he ended up on the like, Worth the Dam beaver committee. And so when that [the beavers discussion] happened, he brought it to the school and you know, with the little tunnel bypass thing that they did, he brought those ideas to us and kind of figured out how we could do involvement. We ended up teaching a small class for elementary school students on the beavers and why they were good for the environment. And we did this little tile project that's actually down next to the little bridge where the beavers are (CM-2, 2020).

In addition to the above-mentioned projects, the ESA students presented at the November council meeting in support of the beavers, which is a focus in the interview I conducted with the primary educator of the ESA. She discussed the ways in which the students were civically engaged:

The city meeting where they had it at the high school... was a change for our students to take their... growing passion and excitement they had for real life

learning and articulate it. My teacher was like, 'okay, here's a lesson on government. Here's an opportunity for public speaking... They got to make a statement of what's important to them in a way that was very public, which then ignites further commitment (CM-5, 2020).

This shows how the engagement with the public by students was educational in and of itself. She went on to explain how she saw her students impacted by their work around the beavers:

It [seeing the beavers] was something to always check in on you know, like, did we do it? You know, did we get to keep the beavers You know, because there was all this, like, they're gonna go take them out of the creek and they're gonna take them somewhere else. It was like a very clear marker of did we accomplish our political action or did we not? And did doing what we did matter? That's a really powerful thing for young people to have as a checkpoint for does my life matter somewhere (CM-5, 2020).

Showing that people can make an impact in the world and change how things are done is perhaps the most significant ways that the Martinez Beavers made an impact, and this impact is all the more important when the group learning these lessons are young and still forming their impressions of how the world works.

Impacts of the Martinez Beavers

Local Impacts

I would say that it's [the events around the Martinez Beavers] definitely part of the way in Martinez people mark their history. So like, you might meet someone who says, Oh, I was pregnant with my daughter at that meeting... So it's definitely part of people's life. Or you meet someone who's a graduate who says, Oh, yeah, when I was in third grade, I took signatures at the deli to save the beavers. This is really part of people's experience. And they remember it... It definitely was part of people's experience (IwC-4, 2020).

Since the events of the Martinez Beavers, beavers have come to be a part of the place-narrative of Martinez. This has largely come to happen due to the community

bonding experienced by those that participated, the annual beaver festival, the continuing presence of beaver related art in the city, and the notoriety Martinez gained for beavers in the Bay area as a result of the beavers.

Building Community Through Beavers

Analysis of the public meetings indicate that those involved with the movement around the Martinez Beavers experienced a sense of community as a result of both spending time around the beavers and the movement itself. Several interviews suggest that this sense of community has continued past the events of the Martinez Beavers and through to the present. The impact that the Martinez Beavers made on the social landscape of the city helps to explain why the beavers have grown into a part of the town's image.

The sense of community that the beavers helped to instill in the people of Martinez was a major point of discussion at the public meetings. Some public commenters discussed how they felt a greater sense of community through spending time with the beavers. As one commenter said,

There are five of you sitting here tonight, voted by the people of Martinez to represent them, and not just a few who appear to own the town, but the homeless I see near the park at the second bridge watching these animals to their construction, that's got to be pretty therapeutic. The alcoholics I've given a few dollars to have a chat with them until about the beavers, because they have also come to visit. The children who are not yet voters but come with their parents to visit the creek and learn about the wildlife family, the unity it has, and how they share the creek so other creatures can live in harmony with them (AM-5, 3:26:00).

This comment discusses the ways in which the beavers allowed different backgrounds to come together through a shared experience of the beavers. Another commenter similarly

discussed how spending time with the beavers helped bring her into community with others:

Even before the death warrant on the beavers was issued, people were gathering at that bridge. I met people that I've lived in town with for years and never met before and never was able to talk to before and this nature, this beautiful part of nature that the beavers created, created little community within the community and brought people out and brought people together" (NM-33, 2:02:00).

Both of these comments discuss connections that were building before the beavers were threatened with depredation, but the seven other commenters that discussed feelings of community spoke about it developing through the effort to convince the city to coexist with the beavers. Seven commenters at the November meeting discussed feelings of community and engagement in relation to the beavers. Four commenters directly talked about the beavers helping to reinforce the sense of community (NM-34, NM-38). One commentor said, "It's not often that an issue comes up that can unite the community the way you have with your original proposal to depredate the beavers (NM-32, 1:34:00)," and another noted the beavers "have brought us all together down here." (NM-18, 1:23:40). These quotes emphasize that the beavers were bringing people together, particularly at the meeting. Three other commenters discussed how they felt the growth of a sense of community that they had previously felt was lacking. One commenter attributed this to getting enough people to agree on something:

I... hadn't felt a sense of community here and I guess that was something I felt was missing... I've felt this sense of community that was lacking and that all has to do around these wonderful little creatures that are living in our city. If it takes those little creatures to get us all together and for the most part agree on something and make us feel like a big family, that's something pretty special (NM-43, 2:21:00).

These comments indicate that the beavers had a significant impact on the sense of community that many in Martinez felt.

Six of my interviewees discussed how events surrounding the Martinez beavers had helped to build new relationships with people that they otherwise would have been less likely to have come into contact with. (CM-7, CM-1, CM-4, CM-5, IwC-2, IwC-3, STR-2). The social relationships that interviewees discussed growing out of the beaver events ranged from expanding their professional networks to building close friendships that remain an important part of their lives. All these comments indicate that the beavers had a significant impact on the sense of community that many in Martinez felt.

Beaver Festival

The beaver festival began as a way of bringing further attention to the beavers and served as an opportunity to educate the public about beavers. It has since become an annual event that, while still focused on beavers, explores the various effects that beavers have as ecosystem engineers and build funding for further beaver activism. The festival has been held 12 times, with the 13th cancelled due to COVID-19. Twelve interviewees discussed the Beaver Festival. That it is referenced by so many people, including people only tangentially related to Martinez, suggests that the Beaver Festival is one of the things that Martinez is known for, both by its residents and by others. The festival has become a means of keeping the beavers in the public mind, educating the public about beavers and ecology more broadly, and, recently, a means of funding further beaver activism.

Two interviewees discussed how the beaver festival began out of an effort to further grow support for the beavers after the city council made the decision not to do anything about the beavers at the moment rather than making the explicit decision that beavers would be allowed to remain, as explained by one interviewee involved in organizing the festival,

The way the beaver festival came to be, was that because the city was not making a decision on the beavers, after the April meeting, because they delayed the decision, we decided it'll be harder for them to make the wrong decision after we threw a party for them. So that's how the beaver festival came to be. It was the stop gap (IwC-4, 2020).

Another person who helped to organize the early festivals emphasized the way that the festival was supposed to be a nonconfrontational space where people could celebrate the beavers, saying,

We talked a little bit about how we could take it beyond just the press releases and on-air interviews, and that's when we decided that doing something like a beaver festival would be kind of fun way to help educate the community that wasn't quite on board... It [the festival] took it beyond just that this one moment in time and allowed everybody to celebrate, in addition to advocating, So it was a happy time and not necessarily one of those push pull kind of scenarios. (CM-1, 2020).

A beaver expert outside of Martinez commended the festival for keeping the beavers in the mind of the public, saying, “By starting a beaver festival, you know, it's like, oh, we're not gonna let you forget the Beaver. We're gonna actually remind you every single year that we have beaver here and having beaver tours” (BE-3, 2020). The festival has been especially good at keeping beavers in people’s minds, especially after the beavers had moved on from the downtown area.

When it first began, the festival was a small event. As an organizer said, “we held the first beaver festival in 2008 and it was a tiny little thing about 300 people came and about 10 Wildlife groups tabled” (IwC-3, 2020). But it has since grown and come to include more than 30 organizations, ranging from local wildlife advocacy and nature conservation groups such as the Friends of the Alhambra Creek, to regional groups such as The Bay Nature Institute, all the way to national agencies such as the National Oceanic and Atmospheric Administration’s (NOAA) National Marine Fisheries Service. Two interviewees talked about the environmental focus of the organizations that participate at the events, saying, “It’s now gotten an awful lot of other ecologically minded people together. Every booth that set up at the beaver festival has to do with ecology (CM-7, 2020),” and “It's basically like a mini-Earth Day celebration where different organizations come out and celebrate nature and there's all kinds of Beaver activities” (STR-2, 2020). One interviewee suggested that many advocacy and educational groups embraced the beaver festival because they could see that species that they were interested in benefited from beavers. As an organizer said, “There were so many wildlife groups, whose own species they were interested in, were helped by beavers, like the salmon people, or the bird people or the bat people, they all got interested in the fact that beavers are researched as having such a benefit to the species” (IwC-3). As the festival grew, the organizers learned how to better put on the event from those that tabled there, increasing their fundraising ability and improving the quality of the event with better sound and more bands (IwC-3, 2020),

Beyond the ecological education aspect of the festival, it is also a place in which people, and specifically children, can engage creatively. The festival incorporated art projects for kids including one year having children paint “a big mural that hangs on the fence every year at the festival” (CM-7, 2020). During the 2009, the festival included The Escobar Bridge tile project which involved children painting tiles with beaver and other environmental themes. This artistic space allowed children to engage with the beavers in a more personal and creative means, but it was not only children that got creative. One community member would do an annual project for the festival, ranging from baking “beaver bread”, to making “a big inflatable beaver” to building rideable “beaver-mobiles” for children (CM-4, 2020) (Figure 7). In addition to being an educational and creative space, it has also come to be a fundraising opportunity for WAD, though it took five years of putting on the festival before it began making rather than costing money. Early on, the festival’s primary means of making money was through sales of t-shirts and through donations, but organizers have since begun doing a silent auction with donations from local and regional establishments, ranging from meals at local restaurants to tickets to the Oakland Zoo to Six-Flags Amusement Park. Learning how to apply for grants meant that WAD could put on the festival without having to use as much of their own funding, which aided in the event becoming a way to make rather than spend money.

The festival has come to be a part of Martinez. As one person said, “It’s a fun event. You know, kids that I’ve seen growing up in a neighborhood have been going to that festival since they were toddlers and now, they’re teenagers” (CM-4, 2020). The 2020 festival was cancelled due to COVID-19, but organizers are eager to once again put



Figure 7 Beaver centric projects created for the Beaver Festival. Photos provided by Bob Rust and used with permission.

the festival on when it is once again safe to do so, and interviews indicate that many in Martinez are as well, as evidenced by an interviewee saying, “It was nice to see that people were attached to the beaver festival, because when we didn't have one, we saw a lot of little messages on Facebook like, ‘Oh, this should be the beaver festival weekend’ that stuff. It's nice to see that it has a meaning for people” (IwC-3, 2020).

Public Art

The public beaver-centric art that has cropped up and continues to appear in Martinez more than a decade after the events are perhaps the most visible way that the Martinez beavers have impacted the City. Ten interviewees mentioned two forms of art projects still on the Martinez landscape: the beaver tile project on the Escobar Bridge (CM-2, CM-5, CM-7, BE-3, STR-2, 2020) and the various beaver murals that have appeared on buildings around Martinez (CM-3, CM-1, IwC-3, BE-3, IwC-2, IwC-6, 2020). As an interviewed beaver expert said, “They have tiles that are painted with beaver that are on the bridge and they’ve got a mural (BE-3, 2020).

At the 2009 Beaver Festival, 81 tiles were painted by the public, including many children, and then were later affixed to the Escobar bridge (Figure 8), which overlooks where the beaver’s dam site was. The project came to be through the coordination of WAD, the city, and the ESA. An ESA student involved with the project recalled, “I don’t remember if it was like an Earth Day celebration or an after-school program, but we allowed the community to draw a little beaver tile about what they thought beavers looked like. And then it ended up being installed right where the beaver dam is



Figure 8 Tile project created at the 2009 Beaver Festival and adhered to the Escobar bridge near the dam site.

downtown (CM-2, 2020). An educator with the ESA recalled the project in a way that made it sound impactful to participants:

We did a tile project where we got elementary school kids and we taught them lessons about the importance of beavers in a creek system and then they did a tile project where the kids painted these things.... It was one of those things that we had enough adult interest in the community that wasn't their main teacher that it drove the kid's interest (CM-5, 2020).

This indicates that participating in the art project helped people to feel engaged around the Martinez Beavers. Another interviewee mentioned the value of the tile project in terms of publicizing the beaver issue because they “had to get permission from the City of Martinez, so every step was always getting permission to do this publicly, so it was always in the public eye (CM-7, 2020).

Interviewees discussed three different murals present on the landscape of Martinez that have appeared since the events around the Martinez beavers occurred. As one interviewee said, “We have the murals. I mean there's a mural on the side of a gas station on Fairy Street... then there's another mural down by the train station with beavers on it. You know they're the town mascot I guess (IWC-2, 2020)” and another excitedly explained, “There was a new mural in Martinez that showed up, a beaver mural, on Monday, a beaver in space” (IWC-3, 2020). The owner of one of the buildings with a mural on it (Figure 9) explained that a prominent Bay Area graffiti artist had wanted to have a piece in the area he lived and felt that the beaver represented Martinez (CM-3, 2020). The building owner explained that the mural has become quite popular with many people around the area taking notice of it:



Figure 9 Beaver mural on the side of a downtown building

It's gone kind of viral and turned into a postcard, the school's take their kids pictures in front of it down here... People take pictures of it all day every day... I said a guy can paint it, it turns out amazing and it's a landmark. You know it's been on Instagram and on the news and everything else. People come from around the area to see it (CM-3, 2020).

The Mural described above shows both the desire of people in Martinez to have beavers around the city, as suggested by the local artist's desire to paint it and the building owner agreeing to it. The public's response to the beaver mural, such as taking pictures of it and media coverage of the mural indicates that beavers remain in the zeitgeist of the town of Martinez.

Known for beavers

Over the events around the Martinez Beavers, several people in town have come to be associated with beavers, and beyond that, the City of Martinez has become associated with beavers. Heidi Perryman is perhaps the person most closely associated

with beavers in Martinez as evidenced not only through her continued activism for beavers with WAD, but in that she was mentioned as someone to talk to about the Martinez Beavers by 14 interviewees. However, Perryman is not the only person in the town to be associated with beavers; three other interviewees discussed being tied to beavers as a result of the events around the Martinez Beavers (IwC-2, IwC-1, CM-4, 2020). Councilmember Ross in particular saw beaver as a part of his political legacy, saying, “My legacy, I’ve been told is... the guy that saved the beavers in the political realms” (IwC-1, 2020). In addition to people in Martinez being associated with beavers, interviews suggest that the city too was associated with beavers, at least in the Bay Area region. As one interviewee said,

When I meet people sometimes who don’t know me that well, but they hear I’m from Martinez, and are like oh yeah, with the beavers? I say that’s right. So, there’s I wouldn’t say national recognition, but high degree of recognition around the area. I don’t know how far it extends, but that the beavers are tied to Martinez. The image and association of beavers in Martinez is very strong (IwC-2, 2020).

Other interviewees also discussed Martinez being associated with beavers, saying, “To this day I’ll go to regional San Francisco Bay Area Meetings and people will ask hey, how are the beavers? It’s our 15 minutes of fame (IwC-2, 2020),” Three additional interviewees also discussed Martinez associated with beavers in similar ways (IwC-4, CM-1, 2020). The way that people outside of Martinez ask Martinez residents about the beavers indicates that the town has a strong association with beavers, even to those outside of the city. Several interviewees discussed the ways in which businesses have capitalized on the association with beavers such as by selling beaver merchandise imagery in their stores (CM-6, CM-1, CM-7, IwC-4, 2020) and how other groups have

taken on beaver imagery, such as a local running group calling themselves the Martinez Beavers and a local polar plunge group that had someone in a beaver costume participate (CM-1, 2020).

Impacts Beyond Martinez

The events around the Martinez Beavers took place during the early stages of an ongoing shift in the way beaver are managed. This shift is in a direction that increasingly embraces coexistence and the evidence suggests that events in Martinez may have been a contributing factor towards this movement (Figure 10). Analysis suggests that the

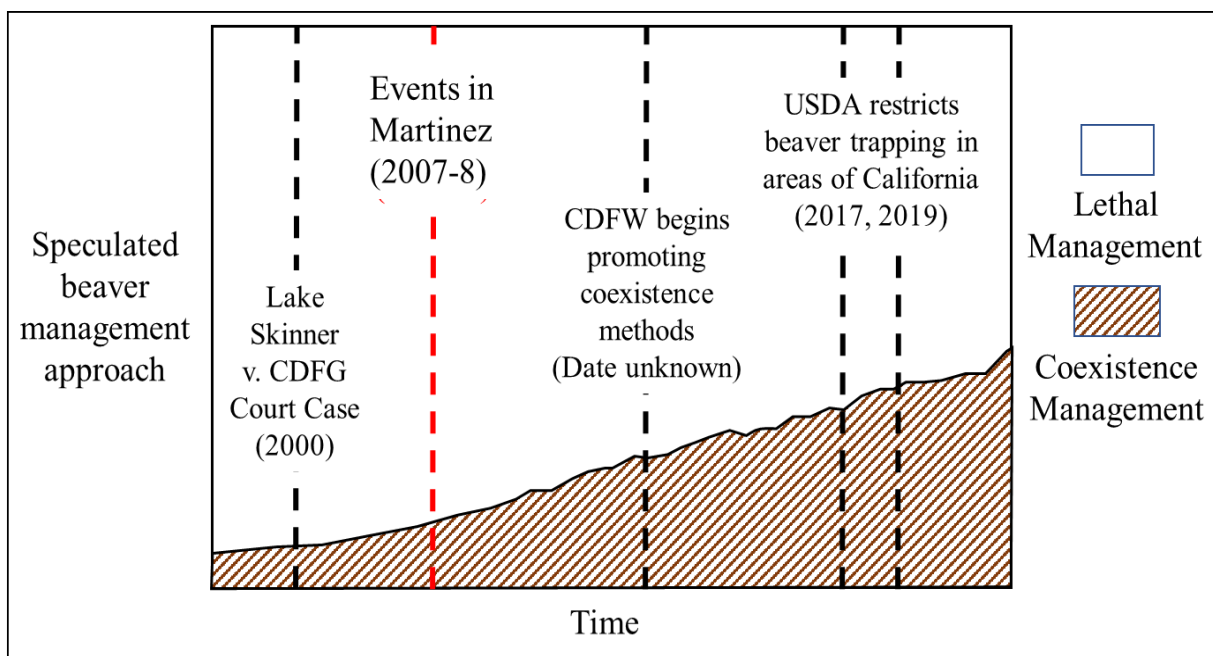


Figure 10 Conceptualization of the positioning of the Martinez events in the timeline of recent beaver management events in California, starting with the Lake Skinner court case which established that issuance of depredation permits is a ministerial action, and thus exempt from California Environmental Quality Act (CEQA) evaluation, the Martinez events, CDFW beginning to promote coexistence strategies, and the recent acts by the United States Department of Agriculture's Wildlife Service to restrict trapping in areas of California until greater environmental review has been conducted. Data for the actual number of beavers trapped annually was not kept, so proportion of coexistence and lethal management is speculated. Figure is not to scale and is for conceptual purposes only.

Martinez events made their impact as a result of the media attention that the events received, discussed previously, and the continued activism of those involved. Some individuals continue to impact beaver management by sharing the story of Martinez and spreading the word of coexistence to other groups they are involved with. One interviewee said,

Several of us... made other presentations to...spread the learning to other areas in the county. I know I made several presentations to the Contra Costa watershed forum and to other groups that were interested. And Igor did too and others. So, we tried to kind of, you know, spread the word and, and share the knowledge (IwC-2, 2020).

These individual efforts have likely spread awareness locally, but the largest impact has been made through the coordinated effort of WAD and the organization's founder, Heidi Perryman.

Worth a Dam

“She's on the internet everyday blogging about beavers, you know, she finds something to say like every day. I'm just always amazed how much she's put into it (CM-4, 2020)”

Two interviewees discussed how WAD grew out of some of the people most involved in advocating for the Martinez beavers. One of the founders explained over two interviews, “Worth A Dam got started when I was on the subcommittee and it sort of became clear that we were going to need somebody to stay involved with the beavers after the subcommittee was gone to stay advocating (IwC-3, 2020),” and, “It seemed it was going to be important for there to continue to be some pressure and some advocates for the beavers, so I got together with people who were involved” (IwC-4, 2020). Another founding member talked about how she got involved with WAD:

I started to have a dialogue with Heidi Perryman, because she seemed to be trying to put something together. And that's something would eventually turn into Worth a Dam and I became the voice of the movement as VP of Communications.... Initially, it was just a small grassroots effort of three women, we would meet at Heidi's house and we would talk about what we could do in terms of community engagement. Heidi was very good at searching out experts and finding ways to craft messaging that provided an alternative way for cities to coexist. My function then was to take those ideas and communicate them (CM-1, 2020).

These quotes show how WAD grew out of the activism that began because of the Martinez beavers. The founder discussed how the name of the organization was meant to express the struggle that activists had experienced in Martinez, saying,

I tried to think about names for worth a dam. And I kind of thought about like friends of the beavers and stuff like that and just seemed all too friendly, too polite for the amount of struggle we had faced, so I was really happy I thought of Worth A Dam in the middle of the night, And I was like, that's perfect... because it's a little feisty and it kind of says exactly what we wanted it to say, get over yourself, deal with this dam and people love it (IwC-3, 2020).

The organization tracked the beavers and kept the public aware of what was happening with the Martinez Beavers through their website, however once the beavers moved on from the downtown area, WAD transitioned into different forms of advocacy. As an involved person said,

Once there wasn't any ongoing activity [at the downtown dam site], the need for ongoing activism moved from the real world to virtual. And that's where Heidi pretty much has taken the reins and has just dedicated a lot of her life to maintaining this tremendous database of information (CM-1, 2020).

The post-beaver advocacy had two broad focuses: Provide information and advice, including lessons learned from Martinez to those wishing to coexist with beavers and working to make beaver depredation a tool of last resort for those experiencing difficulties with beavers.

Information Hub and model

The WAD website, martinezbeavers.org, documents and shares the events around the Martinez Beavers and serves as an information center for anyone interested in learning about coexistence with beavers. Additionally, the website has a library with links to many research papers related to beavers, links to beaver educational materials, a directory of beaver related organizations and a blog that is updated most days that shares the latest news, research, and events about beavers. These are valuable resources to those who are looking to coexist with beavers.

People with WAD have given advice to those that seek it, individuals and, more recently, organizations. As the organization's founder explains:

I've done trainings in other places... They wanted advice on beavers... I've done talks for the Watershed board in San Francisco. Typically I do about three to five talks a year... I'm doing a talk on Tuesday for the Alhambra watershed group and I'm doing a talk the following month for Lindsay wildlife museum... I've been there for the Salmonid Conference.

These talks were largely to wildlife and land management groups and largely served an educational purpose, but more recently, the group has become involved in actual management discussions. The founder described how WAD has been in communication with CDFW personnel after a recent consultation in Oakley:

Recently in Oakley... they had some beavers in a watershed that had built a dam and flood control got worried and got a permit to depredate and they killed the beavers...I got an email two weeks ago from a science officer from Fish and wildlife in California. And she wanted to talk about the watersheds in Oakley, and she was writing proposals for stream alteration and she wanted to talk about the beavers and Martinez and what we did (IwC-3, 2020).

This educational and management focused work spreads the message that successful coexistence with beavers is possible, which is valuable to the cause of coexistence, according to an interviewed beaver management expert:

Martinez is a shining example of people living in close proximity with beavers and it working out --so I think that's it is valuable. And what goes hand in hand with that is how active the Worth A Dam organization with Heidi has been publicizing it and serving as a model and also a resource for people...Through the years, there have been many other examples of people who were inspired by the Martinez story (BE-2, 2020).

I conducted two interviews with people that wished to coexist with beavers and found WAD to be a useful organization. The First was with a co-founder of the Sierra Wildlife Coalition, a wildlife conservation organization based out of Lake Tahoe that began because of a beaver depredation in the area. The co-founder explained the role that WAD played early in their group's history:

We just went online and found Martinez beavers and started. Even back then, Heidi had been going for two or three years at that point and She had a whole bunch of good article links...We started with that and then... several of them [people associated with WAD] have become good friends. It's Heidi, Laurie and Ron Bruno have been a big help. Laurie and Ron came up to our first meeting and... brought a nice check from Martinez Beavers. The donation helped us start.... [Worth A Dam] was information central (IbM-1, 2020).

After these events, the group went on to do advocacy for beavers, coyote, and other wildlife in the region, including tabling at various environmental events, drawing inspiration from WAD in the form of youth outreach ideas, such as paper cutout beaver tails Another a beaver advocate based out of Mountain House, California, said that learning about the Martinez case from the internet and following up with Heidi Perryman over email helped inspire their efforts to advocate for a coexistence model (IbM-2, 2020).

In both of these examples, WAD was easily found online and served as a useful resource in both providing information and connecting people with beaver problems with the experts that are able to provide solutions to the beaver difficulties.

Continued Activism

WAD does various activism beyond education and outreach. They have been involved in various projects including research into the historic range of beavers in California, review of depredation permits issued across the state, and most recently, playing a driving role in organizing the 2021 California Beaver Summit.

Research

WAD has been involved in research into the historic range of beavers in California that resulted in 2 published papers, on which Heidi Perryman is a co-author (C. W. Lanman et al., 2013; R. B. Lanman et al., 2012). The papers use several methods, including carbon dating of ancient dams, to establish that beavers had been present in areas that they had previously thought not to be native to. Perryman explained that her role in the paper was in-part to connect the right people to make the research happen (IwC-3, 2020). This research has been important in establishing and bringing attention to CDFW that beavers are native to a much broader range in California than had been previously understood.

Depredation Permits

Anyone with a beaver problem in California can apply for a depredation permit to kill or have the beaver(s) killed. WAD works to review these permits then uses the data to try to reduce further depredations. Two interviewees discussed how WAD used these

data to attempt to change the management actions of CDFW by presenting them with statistical analysis of depredation permits and spreading awareness of where beavers were being depredated. As Perryman explains:

[We] found was that one county was killing seven times more beavers than anywhere any other county in the state... and they [CDFW] actually were pretty attentive to that piece of information. One of the things that was going on in that county was that people were giving out unlimited permits, which they're pretty much not doing anymore... I contacted the Fishing Game in that area. And they said, we can't issue unlimited permits anymore because that woman came and did that research (IwC-3, 2020).

Another interviewee also spoke about Perryman's work with the depredation permits:

“Heidi has been hammering on them for six or seven years. I mean, they used to... hand out beaver kill permits for unlimited numbers. And she finally got them to at least specify a number. That's as good as you get. It was a huge victory” (IbM-1, 2020).

I worked with Heidi to review and map the depredation data to see the impact that WAD's impact has been on the depredations (Perryman, H. Personal communication, 2020) (Figure 11). The analysis revealed an unevenness in beaver depredations throughout the state with counties in CDFW Region 2 participating in significantly more depredations than counties in other management regions (Figure 11).

The data for 2018 did not have as much information as the other years, so I did not include it in my analysis. I found that over six years studied, CDFW issued a total of 934 beaver depredation permits. Of these permits, 225 allowed for an unlimited take of beaver and the remaining 701 allowed for 12,331 beavers to be depredated. As the

department issued fewer unlimited permits, it simultaneously started using more permits allowing 99 beavers to be taken. The net result of this was likely that the number of beavers being trapped was not significantly impacted by the decision not to issue as many unlimited takes (Figure 12). This indicates that it is important not only to change the base policy, but to instill an understanding of why a policy is changing, otherwise people will find workarounds to return to familiar practices.

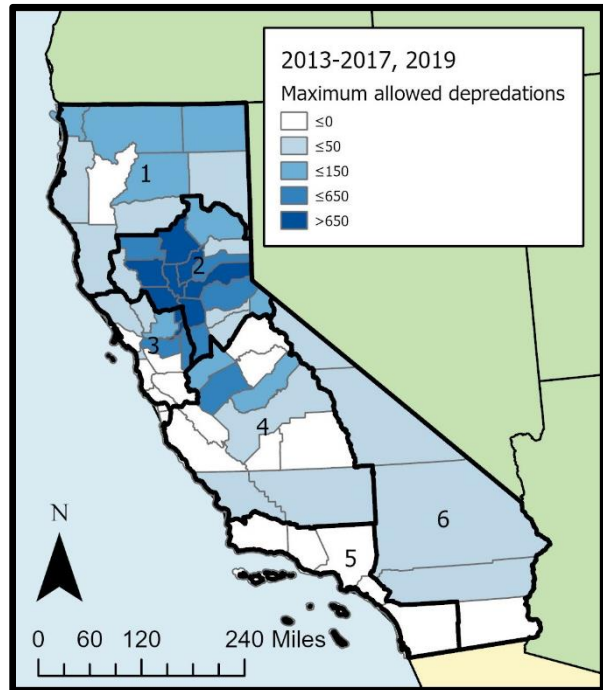


Figure 112 The distribution of the 12,331 beaver deprecations allowed for 2013-17 and 2019 by county and CDFW management regions

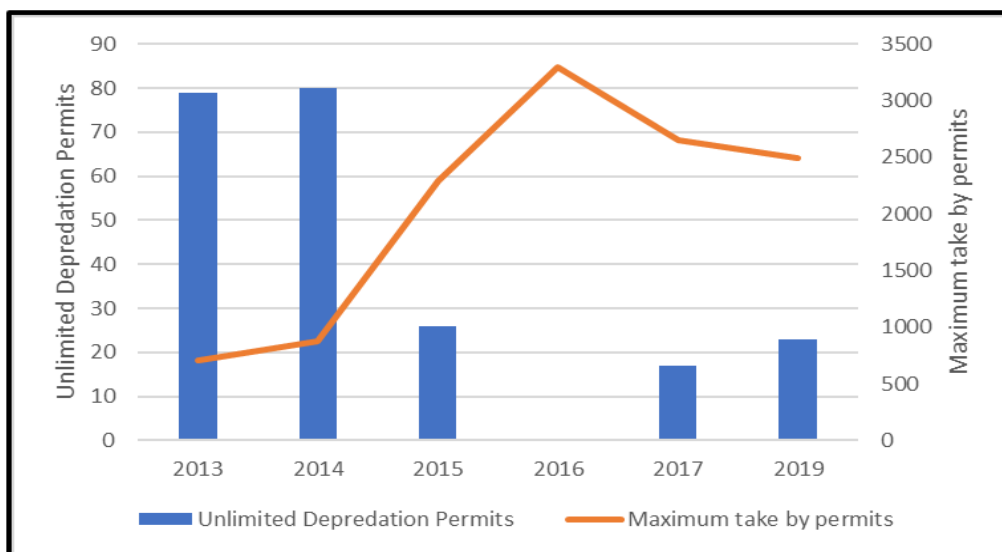


Figure 11 The maximum allowable beaver take by permit and total number of deprecations permits with an unlimited allowable take annually issued.

2021 California Beaver Summit

The 2021 California Beaver Summit was a virtual event that gathered 18 beaver experts to speak about beavers and what they could do to beneficially impact California. The conference focused on the ecological role beavers play as well as the way ecosystem services provided by beavers could be particularly beneficial in California, which has growing concerns about wildfires and endangered salmonids. WAD and its founder were a driving force behind turning the Summit into a reality. Perryman was aware of the New Mexico Beaver summit that was held in 2020 and thought that California should have a similar event.

Within several days, Perryman had reached out to many of the beaver believers in California and the summit was underway. Perryman found that Dr. Jeff Baldwin of Sonoma State University would be interested in hosting and, after some consideration, his department agreed to host the event. A steering committee was formed with Baldwin and Perryman as Conference Co-chairs. Over the following six months, the steering committee met monthly to define the event's goals, find speakers, and advertise the event. The Summit had 1000 individuals register, the maximum amount possible, more than 100 of whom were associated with CDFW. Throughout this process, Perryman and by extension WAD ensured that the event moved forward.

The events in Martinez have had many impacts, both locally and beyond. As Councilmember Ross said at the April meeting, "We'll send out a ripple in the pond, across the world, that Martinez is a place that cares" (AM- M. Ross, 4:20:35). That ripple has spread out from Martinez and made an impact in the world of beaver management.

DISCUSSION

A close review of the case of Martinez can provide numerous insights for the literature related to place and wildlife management. In addition, the case can provide clear lessons for efforts to increase beavers on the landscape when concerns around beavers arise.

Place

Places represent spaces with meanings that are ascribed to them by the people that experience them. The interactions of different meanings held by different groups also make places areas of contestation between ideas, where groups with different amounts of power wage ideological battles over what places mean, as described by Rose (1993) and Blomley, (2006). This battle often takes the form of deciding what does and does not belong in a specific place, be it behaviors, such as loitering or smoking, or individuals, such as homeless people. The Martinez case study provides for an exploration of these concepts because it gets at the question of who has the power to influence whether wildlife is acceptable in human dominated areas. Downtown business and property owners? People who live and work in the downtown area? The public as a whole? The Martinez events indicate that the power rests in the hands of the people but can only be effectively used through the mechanisms of governance.

There was a large discussion around whether beavers did or did not belong in the human dominated downtown area, which is an example of how place could be

constructed based around exclusion, as discussed by Cresswell (1996, 2014). As ecosystem engineers, beavers have a large capacity to alter their environments, so allowing beavers in the downtown area meant that humans would be giving up some control over the physical landscape of that place. Individuals with a greater financial interest in the downtown area, because of property or business ownership, tended to be more reluctant to give up this element of control than those who did not have as great a financial interest. Much of the conflict was about which group was able to define the place of the downtown area and whether it should be an area where financial interests are put first or an area where wildlife can be enjoyed by the general public, which gets into the role that power dynamics can play around the construction of place, which has been discussed in relation to place by several prominent geographers.

The struggle that people experienced around the Martinez Beavers along with the sense of community that individuals experienced while urging for coexistence were key aspects that helped to establish the beavers as a part of Martinez's sense of place. This supports the idea that sense of place developed in part from people's lived experiences in places, as discussed by Stedman (2003). The beaver murals and art of Martinez allude to the connection between the physical landscape and the sense of place and the positive feedback loops of these two elements in human dominated landscapes. The city has some recognition for beavers, so some people in Martinez decided to put in a beaver mural. This beaver mural then further reinforces that the place has a connection to beavers, thus causing more murals and a greater association between the place and beavers as a result. The Annual Martinez Beaver Festival similarly arose because of the place's connection

with beavers and then has served as a factor that reinforces the place's association with beavers. This demonstrates how narratives and associations with places can be self-reinforcing and shows the way that place meanings can be perpetuated through time and to future generations. The beaver artwork and festivals that persist in Martinez reinforce the town's association with beavers, even after the original Martinez Beavers moved on.

Wildlife

The wildlife management decision around the Martinez Beavers represented a management approach based on the public trust doctrine in an urban environment. Because of the urban environment that the beavers settled in and the area's history of flooding, city officials were concerned about the beavers. The officials sought experience from management experts who recommended a course of action that was publicly unpopular. This instigated a process of discovery that resulted in a solution that permitted the beavers to remain in the area and allowed people to continue to enjoy them.

The conflict around the Martinez Beavers demonstrates how what are sometimes referred to as "human-wildlife conflicts" are actually conflicts between people about wildlife (Redpath et al., 2015; Young et al., 2010) and are often the results of events that are only perceived to be conflicts because of lack of information or misinformation (Dickman, 2010). The Martinez events underscore the role that perceived risk of damage from wildlife can play in management decisions. At the time when the depredation permit was issued for the beavers in the downtown area, the beavers had built a dam and gnawed down some of the vegetation along the stream, but they had not caused damages to any of

the adjacent properties. It was fear of potential damages that spurred those who wanted the beavers to be removed to seek depredation. Some of the concerns were around vegetation damage and burrowing while others were concerned about the potential for increased flooding. Each of these was an area of contestation between those that wanted the beavers removed and those that wanted the beavers to remain, with the conflict being between people about the validity of the concerns and efficacy of damage mitigation techniques. The Martinez events show the importance of providing technical solutions to deal with potential impacts from wildlife, which Redpath et al. (2015) discussed as an important part of avoiding conflicts. Those seeking coexistence argued that the fears were based around misinformation rather than facts. They brought forth evidence which showed that instead of degrading vegetation, beavers often increase vegetation over an extended period of time; that the burrowing present at the dam site had not been done by beavers; and that there were viable methods of coexistence to address concerns of flooding.

The interactions that people had with the beavers through time observing them highlights the alternative types of interactions people can have with wildlife other than conflicts, as described by Bhatia et al. (2020). In Martinez, these non-conflict-oriented interactions have culminated in an annual festival for an animal that is considered a nuisance elsewhere. This shows that when interactions are viewed outside of the conflict/acceptance lens, something more than just acceptance is possible: celebration.

The Martinez case further demonstrates the role that such interactions can play in management decisions. Prior human dimensions research found that firsthand

experiences of beavers, either positive or negative, was one of the most significant factors in determining the acceptance of beaver (Enck, Connelly, & Brown, 1996). This helps to explain why people in Martinez decided to coexist with the beavers: many people in Martinez had more than a year to see and interact with beavers in a context unrelated to conflicts before the concerns were voiced publicly. This meant that many people interacted with the beavers positively before a management decision was made. This period of time was likely very important in the decision not to have the beavers depredated. In this way, the Martinez case supports Enck et al.'s (1996) assertion that direct positive experiences with beavers is an important factor in coexistence.

Those arguing in favor of coexistence with beavers in Martinez advocated for an alternative view about how wildlife should be managed in relation to people. The wildlife values orientation framework described by Fulton et al. (1996), which describes beliefs as being grouped into different values orientations, such as use and appreciation groupings, which act independently of each other, can help to interpret the values and beliefs that were important in the Martinez case. When looking at the discussion through this framework, a strong positive appreciation values orientation can be seen in many of the comments people gave when they talked about enjoying that the beavers were nearby. People at the public meetings and interviews also talked about watching and spending time near the beavers, which highlighted uses people got from beavers that were alive, that people would no longer be able to experience if the beavers were killed. In this way, the use orientation balanced the peace of mind that adjacent property owners would get from the depredation of beavers against the enjoyment that the general public received.

The Martinez case can aid in illuminating how these values orientations impact management decisions because of how the management action is framed, either as in line with or against widely held public values.

Martinez demonstrates some of the shortcomings of the wildlife acceptance capacity (WAC) framework described by Purdy & Decker (1988). Their framework treats WAC as more of a static measurement of public opinion, rather than as an ever-changing weathervane. Instead of treating the initial conflict as a sign that the population of the nuisance species has grown too large, it should be a sign that additional management attention is needed. The Martinez case shows that this additional management attention can take the form of coexistence strategies. The Martinez case demonstrates that public opinion can be influenced by interactions and the availability of information. More recent WAC work focused on beavers has acknowledged these failings and has focused on what can be done to affect WAC through outreach, education (Siemer et al., 2013), and even by financially incentivizing acceptance (Morzillo & Needham, 2015). The benefits that the WAC framework is supposed to provide have become less useful as the public has taken a more active role in the discussion of appropriate wildlife management approach (Eeden et al., 2017). The Beaver Subcommittee in Martinez serves as an example of the ways that the public is increasingly participating in wildlife management discussions.

The Martinez case highlights the important role that urban wildlife can play in conservation. Because of their prominent location in downtown Martinez, people, including many youths, were able to connect with the beavers in a way that spurred people to protest when they became threatened by the city. This meant that the city was

not able to quietly remove the beavers and forced the city into a conversation about what the appropriate management action would be. Once the public interest story of the beavers began to spread, the proximity of Martinez to the population centers of the Bay Area transmitted the story to an even broader audience, further spreading the message of beaver coexistence. Soulsbury & White (2015) discuss the benefits that urban wildlife can have, pointing to the cultural and ecosystem benefits urban wildlife can provide, but they fail to examine the benefits that a species of wildlife may experience by having urban representatives. Exposure to wildlife in urban environments can spur individuals to care about the conservation of that species more broadly, as demonstrated by the Martinez Beavers.

Lessons from Martinez

The first lesson from the Martinez Beavers is that it is often possible to coexist with beavers, even in urban environments, as demonstrated by the nine years that the beavers remained in downtown Martinez. Beaver experts Skip Lisle and Mike Callahan disagree on whether lethal management is ever necessary, but both agreed that problems could often be resolved non-lethally with the appropriately trained expert. One beaver manager said that he is almost always able to solve the problem non-lethally and another said that 3 out of 4 times he could solve the problem (BE-1, 2020; BE-2, 2020). These responses show that Martinez need not be unusual in its ability to coexist with beavers and that coexistence techniques can be broadly effective. Martinez also shows that getting to coexistence can be a lengthy process. Reaching coexistence in Martinez

required public engagement and an appropriately inquisitive response from the government in the form of the beaver subcommittee. The subcommittee acted as a space where people on all sides of the issue could bring forward information and compare it with the information presented by others, resulting in a fuller consideration of potential management strategies. This in-depth process of engagement and discovery may not be necessary everywhere to get to the point of coexistence, and the more common coexistence with beavers becomes, the less likely it will be that such a process will be needed.

The second lesson from Martinez is that beavers, as wildlife, will exhibit agency in ways that can contradict with human desires. In Martinez this happened both when the dams were initially constructed and when the beavers eventually vacated the area nine years later. The beavers that some people in Martinez fought so hard for remained in the area for less than a decade before dying and/or moving to other areas. One person at the April meeting made a comment that, looking back, feels somewhat prophetic:

There is a question, 'do we keep the beavers, or remove the beavers?' You can't really keep the beavers unless you trapped them and cage them. I think maybe there's something like letting the beavers do what they do, but keeping the beavers is not really an option. So even if there's money spent to improve the creek to allow the beavers to stay there, there's nothing that is going to guarantee that the beavers will stay there. Everyone's enjoyed the beavers, I've of course enjoyed the beavers, but I think we should stop saying keep the beavers 'cause that's the one thing we just cannot do (AM-21, 4:13:15).

This emphasizes that the town was allowing wild animals with their own behaviors to live in the downtown area and as wild animals, beavers are naturally migratory and will often move to new areas after being in an area for a period of time. The Martinez case

shows that when faced with beavers, a manager should take the minimum action to mitigate potential damage and not invest extensively in an animal that may not remain.

The next lesson from Martinez relates to the role an active, engaged community can play in shaping human-wildlife decisions. Without the people of Martinez being engaged in the place where they resided, the city would have been able to quietly depredate the beavers before there was ever any commotion made about it, but instead, the beavers were able to live in the environment as long as they chose to. In this way activists in Martinez were able to make the change in management decisions that they wanted. It takes an involved public that pays attention to what government does to ensure that the governing body is acting in lines with the interest of those it is said to represent. Importantly, it was through the continued engagement in the form of the beaver subcommittee's discovery process that the Martinez events made their mark, through a thorough examination of available options. Through the subcommittee, the public was reassured that they had a role in in management, including what information the governing body considered during the decision-making process. Further, the activists in Martinez engaged young people in an effort to exert public pressure from broader base of support, including the young people that are not often involved in management decisions. It was because of activism from engaged people that the city of Martinez was able to set an example for coexistence that challenged the previous way of thinking that had dominated beaver management in California. The activism in Martinez was effective for the following reasons:

- The grassroots organization engaged a broad swath of the community, including young people.
- Activists researched beavers and used scientific evidence to support their position for coexistence
- Activists engaged in the management process as stakeholders

The final and perhaps most important lesson from the Martinez Beavers is that decision makers need not always accept conventional management approaches and can be skeptical, exploring alternative options. When Martinez City staff consulted with DCFG, they were told that they could depredate the beavers or do nothing; when staff asked the Sacramento Area Flood Control Agency about coexistence strategies, they were told they did not work. It wasn't until considering a wide array of options and consulting with beaver management specialists that the city was able to come to the decision to coexist with beavers. The nine years that the beavers remained in the downtown reach of the Alhambra creek demonstrates that the conventional wisdom that the city initially received was wrong and that there are beaver coexistence strategies that can allow coexistence without damage or flooding. Since the events of the Martinez Beavers, CDFW has shifted their stance on beaver management and now prominently provides information about coexistence strategies. Such shifts can only come to happen when people, like those in Martinez, question conventional advice, explore alternative options and demonstrate the validity of alternative approaches.

CONCLUSIONS

For thousands of years before the arrival of European colonists, beavers shaped the landscapes of North America. Their dams regulated the flows of water, sediments, and nutrients through the veins of the land, which are streams and rivers. Native Americans recognized the importance of beavers as ecosystem engineers within their traditional ecological knowledge (TEK) (Goldfarb, 2018). Many tribes in arid western lands refused to participate in the beaver fur trade out of recognition of the ecological importance of the animals (Goldfarb, 2018), but this did not deter western trappers from bringing beavers to the brink of extirpation. However, advancements in historic ecology and an increased appreciation of TEK in recent decades have caused an increasingly large number of people to recognize the ecological role that beavers play (Brick & Woodruff, 2019).

After centuries of trapping, activists, scientists, and now land managers are increasingly recognizing the significance of these ecosystem engineers. In California, Native tribes, sometimes in partnerships with other land managers and restoration practitioners, have been at the forefront of the effort to return beavers to the landscape. The Yurok Tribe of Northern California has been using artificial beaver dams, beaver dam analogues (BDAs), as both a restoration tool and a means of creating ideal habitat for beavers to return to the landscape. The Tule River Tribe in south-central California has been using tribal sovereignty as a workaround to relocate beavers in California, an

action that has been prohibited by CDFG for more than half a century (Various, Personal Communications, 2019, 2020).

As these efforts to return beavers to the landscape see increased success, it also increases the potential for conflict. The Martinez events mark a moment of change in which conflict with beavers evolved into coexistence because members of the community got to know a family of beavers quite intimately and decided to explore alternative management approaches and examine other potential outcomes. This case study can thus provide insights on how to minimize future conflicts that may arise as beaver reclaim their niche in the ecosystem. Parallel to the grassroots beaver movement that Martinez was a part of, the mindset at CDFW, NOAA, and other agencies has begun to shift towards coexistence mindsets as well. Further research could focus on how state and federal agencies view beavers and beaver management and how those attitudes have shifted over time.

The Martinez case study emphasizes how managing beavers is as much about managing people's perceptions as it is managing the actual wildlife. As one beaver subcommittee member said in an interview,

Even though there are no beavers there, there's no dams there, it's still in people's minds. It's the ghost beavers...Solving the actual problems that beavers caused took Martinez about four hours; solving the problems that people imagined they would or could cause— we could still be working on it (IwC-4, 2020).

If coexistence is to be possible as the beaver populations continue to expand, both in number and occupied range, beaver believers must learn how to exorcize the problematic ghost beavers from people's minds.

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APPENDIX A: INTERVIEW CONSENT FORM

CONSENT FORM: Interview Relating to Beaver Management in Martinez, CA**Project Title:**

On the management of urban beavers in Martinez, CA

Purpose of the project:

The primary purpose of this investigation is to understand how public opinion affected the beaver management decisions in Martinez, CA in 2007 and 2008. This information will be used to help inform what management decisions are appropriate when beavers appear in public areas. A goal of this project is to show the importance of public input in environmental decisions.

What will you be asked to do:

If you agree to participate in this project, you will be interviewed in-person in a private or semi-private location and will be recorded with your consent and later transcribed for analysis. Questions will start by assessing your position within the community, which will be used to understand how different parts of the Martinez community responded when beavers appeared. Questions will then focus on your involvement in the eventual management decision. Finally, questions will look at how the management decision to allow the beavers to remain has impacted you. Interviews will likely last between 30 and 90 minutes depending on participant engagement.

Risks and benefits: We do not anticipate any risks to you participating in this study and there are no direct benefits to you for your participation, however I hope that telling your experience will be rewarding.

Compensation:

As a participant there will be no direct benefit to you for taking part in this study.

Confidentiality, use of Information, and records:

Research records will be kept in a locked file cabinet or password protected server; only the researchers will have access to the records. Your answers could be used in a final publication and if so, you choose to have you answers appear in the following way (please indicate below)

- I may be quoted directly and cited by name.
 - I may be quoted directly, but not cited by name. (Cited as; “Martinez teacher”, “local activist”, etc.)
 - I may be quoted directly, but not cited by name. (NOT cited in any way)
 - I do not wish to be quoted directly, nor have my name cited.
 - Other: _____
-

With your consent, Data, including direct quotes from interviews, will be retained for possible use in research reports, publications, or presentations in the future. Records will be retained after the completion of the project for future use with consent. If you wish to be informed of future use of your answers on other projects, please indicate below:

- Data collected may be used for future projects
 - I would like to see the completed future project that may use my data
- Contact information: _____
- Data collected may NOT be used for future projects

Taking part in this interview is voluntary:

You may skip any questions that you do not want to answer. If you decide to take part, you are free to withdraw at any time.

If you have questions, please contact:

Zane Eddy (Primary Investigator) at zeddy@humboldt.edu or call at 541-231-4797 or Laurie Richmond (Faculty Advisor) at laurie.richmond@humboldt.edu or call at 707-826-

If you have any concerns with this study or questions about your rights as a participant, contact the Institutional Review Board for the Protection of Human Subjects at

3202

Statement of Consent:

I understand that the Investigator will answer any questions I may have concerning the investigation or the procedures at any time. I also understand that my participation in any study is entirely voluntary and that I may decline to enter this study or may

withdraw from it at any time without jeopardy. I understand that the investigator may terminate my participation in the study at any time. I have read the above information, and have received answers to any questions I asked. I consent to take part in the study.

Your Signature _____ Date _____

Your Name (printed) _____

In addition to agreeing to participate, I also consent to having the interview audio recorded.

Your Signature _____ Date _____

The researcher will keep this consent form for the duration of the IRB approval.

APPENDIX B: INTERVIEW QUESTIONS

Martinez:

- **General background: Can you tell me a bit about Martinez and your connection to the city?**
 - How long have you lived in the area?
 - How close to the beaver dam did you live??
 - Did you own or rent at the time?
 - Did you have kids?
 - Did you keep up with politics at the time and if so, what was your affiliation?
- **Beaver arrival: Can you tell me about the beavers before there was talk of removing them?**
 - Was the arrival of beavers in Martinez your first interaction with beavers?
 - When and how did you first hear about the beavers?
 - Did the presence of beavers in the city change your behavior?
 - Did they affect the extent to which you spent time in natural settings or the extent to which you viewed non-beaver wildlife?
- **Decision making: How and when did the conflict between city management and the beavers begin?**
 - What was your involvement with the beaver management decision in Martinez?
 - Did you feel like your voice was heard?
 - If involvement was voluntary, what was your motivation to get involved?
 - What was your opinion on the relocation option made available to the city? Why?
 - How did you feel about the public's level of participation in the management decision?
 - Were some people or groups more vocal or influential in the decision making process?
 - Were there specific lines that divided opinion on what should be done with the beavers?
 - How did the availability of knowledge play into the management decision?
 - Did you feel there was enough information available to make an informed management decision?
 - How did the availability of information change?
 - How could the decision making process be improved?
 - Did your opinions on the beavers change through the decision-making process?
- **Results**
 - Has involvement with the beaver decision affected your level of engagement with others in Martinez? How?
 - Did you make friends or other lasting relationships?

- Did the decision making process in Martinez have lasting social impacts, either positive or negative.
- Do you view the decision-making process in Martinez as a success?
 - What went well? What didn't?
 - Were you content with the final decision? Why or why not?
- During the city council meetings there was a lot of talk of how to maximize the benefits of beavers. Was the city/community successful at capitalizing on the beavers?
 - What was done well and what could improve?
- Have you noticed changes as a result of the beavers being in the City?

Agency Staff:

- What is your agency's role in the management of beavers In California
- Has the perceptions of beavers changed through your tenure at the department/agency? If so, how?
 - Where has push for change come from? Internal or external, academic, NGO, or other agencies?
- What outside support does the agency need?
 - What might an ideal pilot project look like to the department/agency?
 - There has been a lot of discussion about Tribes using sovereignty to relocate outside of state structures. Could such a project be useful

Management professionals:

- How did you first get involved in beaver management?
 - How long have you been doing it?
 - Where have you worked with beavers?
 - What sorts of areas do you typically work in? (Urban/rural; public, private, or tribal lands; proximity to people; ect.)
 - Do you typically work for individuals, municipalities, agencies, or some other group?
 - Does preferred management vary based on employer.
- When a potential client contacts you, what are the most common complaints and what types of services do you provide?
 - Have there been any particular incidents that were particularly unusual?
 - Do you believe that lethal management is necessary/appropriate in some circumstances? Why?
- I've heard a number of people talk about "wildlife acceptance capacity" with relation to beaver. Are you familiar with the concept and if so, do you have any thoughts about it?
 - What does the concept mean to you?
 - Does it make sense as a way of looking at beaver management?
- Have you noticed changes in how beavers are perceived by clients in your time working with beavers? How? In what way? What do you think has led to these changes?
- Could you walk me through the assessment and management steps that you typically follow?
 - So, you get a call about a problem beaver showing up in a local stream, where would you go from there?

- What are some common scenarios?
- Is maintenance on devices required and if so, do you provide those services or teach clients to maintain them?
- How much of your work is educating clients?
- How is business?
- Is there a typical installation price?
- Are you familiar with the management decision in Martinez, and if so, do the events in Martinez stand out to you as unusual?
 - Do you often get calls from different regions?
 - If you have worked across multiple states/regions, have you noticed differences in how policy affects management across regions?
- Have policy makers (state fish and game/wildlife departments) consulted with you?

APPENDIX C: CODING ANALYSIS CATEGORIES

Place/time based:

- Downtown declining/interest in change (I)
- Local environmental history (I)
 - Creek restoration project
 - John Muir (I)
 - Refinery town (I)
 - History of flooding (I)
 - Other
- Event is taking place during time of changing beaver discussion (E)
 - Availability of information (I)
- Novelty of beavers (I)
- Small town dynamics (I)
 - Distribution of political power (I)
 - Preexisting pro/anti-city sentiments (I)
- Engaged community (I)
- Affluent community (I)
- Other

Reason to keep or remove:

- City Council Meeting (I)
- Massive public interest (I)
- Alternatives to removal (I)
- Beaver concerns
 - Flooding (I/E)
 - Vegetation damage (I/E)
 - Bank burrowing (I)
 - Beaver wellbeing (I/E)
- Beaver Benefits
 - Expensive to fix
 - Habitat creation (I/E)
 - Engaging with/caring about nature (I)
 - Nature in Urban area (I)
 - Educational opportunity (I)
 - Economic development of downtown (I)
- Other

Lasting impacts:

- Media/news (I)
- New types of media/communication (I)

- Martinez know for beavers (I)
- Expanding beaver education (I/E)
- Continued beaver interest (I)
- Example for younger generation (I/E)
- Festival (I)
- Visual/art projects (I/E)
- Heidi as information hub (I)
- Martinez as model for other cities
- Social relationship Impacts
- Other

Grassroots effort:

- Impact of individuals (I)
- Using skills within the community (I)
- Community engagement (I/E)
 - Community festival (I)
 - Vigil (I)
- Public input in decision making (I)
- Changing Opinions (I/E)
- Other

Misc:

- Misinformation/lack of information (E)
- Personal ownership/ sense of responsibility (I)
- Where Martinez Beavers came from (E)
- Youth involvement (I)
- Prior experience with beavers (E)
- Wildlife isn't the underlying issue (E)
- Wildlife and green spaces good for social cohesion (E)
- Group bonding (E)
- Bridging activities (E)
- Changed routines (I)
- Trust (E)

(I) = Intrinsic

(I/E) = both intrinsic and extrinsic

(E) = Extrinsic code