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Understanding perceptions that drive conflict over the endangered Hawaiian monk seal

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As conservation and management actions facilitate the recovery of threatened and endangered marine species, and human populations expand in urbanizing coastal areas, people are increasingly coming into contact with marine wildlife. These increasing human-wildlife interactions can cause conflict, as has been the case with the endangered Hawaiian monk seal. Since 2009, there have been at least sixteen documented monk seal killings by gunshot or head trauma. Drawing on interviews, surveys, and government and media reports, we explored the underlying drivers behind this conflict, examining how social construction of wildlife, levels of conflict, and ideas from risk communication inform these drivers. Across these sources, we found that most people on beaches where seals are present and other members of the public hold positive perceptions of monk seals and are not engaged in conflicts. Rather, conflict is driven by individuals who have strong feelings about seals and what they represent, which in some cases conflicts with their own values and sense of identity. Many monk seal recovery volunteers saw themselves as protectors of endangered seals, seeing the species as an innocent victim of human-caused environmental destruction. Some fishermen viewed seals as resource competitors, and there were those who also saw them as symbolic of federal government restrictions on access to natural resources. Native Hawaiians who disliked seals saw them as invaders in their native homeland, and perceived federal actions to protect seals as a continuation of colonial restrictions on their rights and access. Social media and other platforms also play an emerging role in escalating the conflict over monk seals. Natural resource managers have engaged in multiple intervention strategies to address conflict, including message framing, education and outreach, and efforts to increase public trust. However, these efforts have not always targeted the people most likely to interact with monk seals as populations recover. Ultimately, it is important for resource managers to articulate their own assumptions and values, and to work to understand the assumptions and values of those who may be affected by successful monk seal recovery efforts, to develop effective strategies that prevent and address conflict over this recovering endangered species.

KEYWORDS

Hawaiian monk seal, human-wildlife conflict, endangered species recovery, social construction, levels of conflict, risk communication, social media, marine management

1 Introduction

As the Endangered Species Act (ESA) and other conservation and management actions facilitate the successful recovery of many threatened and endangered marine species (Valdivia et al., 2019), and human populations expand in urbanizing coastal areas, people are increasingly likely to interact with protected marine wildlife. While these interactions can bring excitement, wonder, and economic benefit to coastal communities (Loomis, 2006; Cisneros-Montemayor et al., 2013), they can also result in conflict, particularly over shared spaces or shared resources (Draheim et al., 2015; Guerra, 2019). In some cases, these types of conflicts have resulted in prolonged legal battles between advocates for marine species and those who want to maintain access to marine and coastal resources (Carswell et al., 2015; Konrad and Levine, 2021). In other cases, conflict has resulted in the death of threatened marine species, such as the recent intentional killings of endangered monk seals in Hawai'i (Harting et al., 2021; Carretta et al., 2022) and the shooting of pinnipeds and sea otters in central California (Baxter, 2015; Barcenas-De la Cruz et al., 2018). While elements of each of these conflicts are species and place specific, they have many common drivers and are often due to differences in values and worldviews between parties in conflict.

To prevent or mitigate conflict related to recovering wildlife populations, including marine species, it is important to understand the underlying factors that drive conflict (Manfredo and Dayer, 2004; Marshall et al., 2007). Human values are critical in shaping how people perceive wildlife (Messmer, 2000; Riley et al., 2002; Dickman, 2010; Madden and McQuinn, 2014; Bennett et al., 2017; Muhar et al., 2018). People from divergent backgrounds and value systems may perceive the impacts of wildlife differently, which may lead to conflicting beliefs about the species and objectives for managing interactions with them (Riley et al., 2002; Jackman et al., 2023). In some cases, the material impacts of wildlife may be less important in shaping people's attitudes than the degree to which people agree with how wildlife is governed and the actions of governing institutions (Merz et al., 2023). Unfortunately, values and perceptions toward wildlife have received less attention in research relating to wildlife conflict when compared with ecological and biophysical factors (Manfredo and Dayer, 2004), though attention to these questions has expanded in recent years (König et al., 2020). The emotional and cultural dimensions of human-wildlife interactions are critical to coexistence (Pooley et al., 2021), and greater attention to how social contexts and material impacts of human-wildlife interactions interplay with approaches to managing conflict are important in designing effective conservation and conflict management programs (Redpath et al., 2013).

The endangered Hawaiian monk seal (*Neomonachus schauinslandi*) is a classic example of a recovering species whose presence evokes predictably diverse responses. In this paper, we explore the underlying drivers of conflict as interactions between people and Hawaiian monk seal populations increase in Hawai'i. This analysis will both (1) inform better management of conflicts

about Hawaiian monk seals and, (2) provide insights to help others embarking on marine mammal recovery to proactively anticipate the potential for increased interactions and conflict that paradoxically may be an inevitable outcome of successful recovery.

2 Rebounding species and the potential for human-wildlife conflict

Human-wildlife conflicts are now recognized as largely social conflicts between people about wildlife and how wildlife should be managed (IUCN, 2023). These conflicts may stem from groups of people experiencing different types of interactions with wildlife, for example visitors viewing wildlife in a park for the first time vs. residents near a park interacting regularly with the species in their backyards, as well as different perceptions of the same interactions when the animal is viewed as a pest or pet (Herda-Rapp and Goedeke, 2005; Jerolmack, 2008; Leong, 2009). When animals have become rare enough to be protected under the ESA, interactions with them are also infrequent. As populations rebound towards recovery and interactions become more frequent, people will increasingly need to make sense of these novel types of encounters. The encounters themselves are not inherently good or bad; they are weighted through human values that determine their importance and whether the impacts from those interactions are valued on the whole as positive or negative (Riley et al., 2002). A large body of research has demonstrated that many of the conflicts associated with wildlife conservation stem from divergent value systems, worldviews, and histories of the parties in conflict, especially as people learn to make sense of increasing interactions with wildlife that have become intolerable for some (for example, see Hill et al., 2017; Frank et al., 2019; IUCN, 2023). Understanding the specific drivers of these conflicts is necessary for successful recovery and coexistence.

Some core concepts related to drivers of conflict include: social construction of wildlife, levels of conflict, and risk communication. Social construction refers to the process by which people attach meaning to the physical world; the way we understand animals and our interactions with them is based on physical considerations, but they are filtered through the social and cultural symbols and norms that determine how we think about them (Herda-Rapp and Goedeke, 2005; Leong, 2009). Different groups of people may apply different societal norms, leading to conflict. For example, anglers have viewed recovering river otters (*Lutra canadensis*) as "hungry little devils," while protection activists viewed them as "playful, ecological angels" (Goedeke, 2005). This process has also been shown for common species becoming overabundant, where white-tailed deer (*Odocoileus virginianus*) were alternately viewed as pests or pets (Leong, 2009), and for increasing populations of feral domestic species, e.g. outdoor cats (*Felis catus*) seen as invasive species or homeless pets (Leong et al., 2020).

When differing constructions of wildlife are based on identities, conflict becomes even more difficult to manage. The levels of

conflict framework illustrates how resolving a surface level dispute can appear to be relatively straightforward, but conflicts with a long history or that impact the sense of identity or values of the parties involved can become intractable (Madden and McQuinn, 2014; Zimmermann et al., 2020). In these instances people may only voice surface level concerns, when they actually care more about threats to their identity or values. The nature of the conflict thus informs the type of resolution needed, where deep-value identity conflicts require reconciliation techniques that transform dialogue from a focus on the visible disputes about how to manage physical interactions with wildlife to addressing the harms to identity or values that may stem from the way management priorities or methods are applied and perceived.

Approaches to communication also may drive conflict when they are not targeted to the appropriate level of conflict. While education and outreach may be helpful in addressing surface-level disputes, these approaches are not well-suited to addressing the deeper level drivers. For example, it is well known that experts and the public perceive risk differently, with experts more focused on probability of harm (hazard) and the public focused on characteristics of the risk (outrage), such as whether it is a known or new risk, natural or man-made, chronic or catastrophic, and whether it approaches everyone equally or if some people are more affected than others (Slovic et al., 1979; Morgan et al., 2002; Sandman, 2021). For each of those dimensions, the former is perceived as less risky than the latter, regardless of probability of harm. Perceptions of risks and benefits also may differ between managers and publics, further driving conflicts (Bruskotter and Wilson, 2014). In addition, public risk perceptions are formed within a social context, where entities such as news media, cultural groups, or interpersonal networks can amplify or attenuate perceptions of risk and may not be aligned with expert perspectives (Kasperson et al., 2022).

The majority of research to date on human-wildlife conflict has focused on terrestrial species where wildlife encroaches on what are viewed as human spaces. More recently, scholars have begun exploring human wildlife-conflict in coastal and ocean systems (Denkinger et al., 2014; Draheim et al., 2015; Guerra, 2019; Konrad and Levine, 2021). Notably, Sprague and Draheim (2015) apply the Conflict Conservation Transformation framework (Madden and McQuinn, 2014) to better understand how levels of conflict influence the emerging conflict over monk seals in Hawai'i. Using a largely theoretical approach, they describe how issues of government mistrust, perceptions of monk seal origin, disputes over resources and regulation, and underlying conflict relating to Hawaiian history have sparked debate over monk seals and their management. Our research uses primary data to expand on their theoretical work to improve our understanding of factors influencing the continuing conflict over the Hawaiian monk seal.

2.1 Hawaiian monk seals

The Hawaiian monk seal can be found throughout the Hawaiian archipelago and is native and endemic to the Hawaiian

Islands, with some evidence of monk seal remains found in Hawaiian middens in archeological studies (Watson et al., 2011). While little is known about their population prior to 1950, those who study this species assume that they had broad distribution across the archipelago prior to the arrival of humans (Baker and Johanos, 2004; Littnan et al., 2017a). Hawaiian monk seals spend most of their lives at sea and come to shore only to pup, nurse, molt, and rest (Antonelis et al., 2006). Monk seals are opportunistic feeders, preying on a variety of fish, cephalopods, and crustaceans. They forage both nearshore and offshore, diving to significant depths to find food (Cahoon et al., 2013). Mating occurs at sea and is rarely observed. Females may give birth as early as age five after an estimated 10–11 months gestation (Johanos et al., 1994). Mothers nurse their pups for about six weeks before weaning them. Hawaiian monk seals are solitary animals, though they may occasionally form small groups (Robinson et al., 2022).

Unlike many other marine mammals, monk seals do not play a strong role in traditional Hawaiian culture (Watson et al., 2011; Kittinger et al., 2012), and it is likely that populations were extirpated from the main Hawaiian Islands (MHI) shortly after the arrival of the first Polynesian colonists on the islands (Baker and Johanos, 2004). The remaining monk seal population was limited to the Northwestern Hawaiian Islands (NWHI) which remained largely uninhabited by people. Monk seal populations were reduced dramatically in the 1800s due to hunting, and their numbers were further depleted in the early 1900s, likely caused by human disturbance (fishing and military activity) and/or ecological shifts (associated with the Pacific Decadal Oscillation) in the NWHI (Baker et al., 2012; Littnan et al., 2017a).

Based on critically low population estimates of 1000 ± 500 seals and ongoing population decline, the species was listed as depleted under the Marine Mammal Protection Act (MMPA) and endangered under the ESA in 1976 (Littnan et al., 2017b). In addition, Hawaiian monk seals have been protected by the State of Hawai'i since 2010 under Hawai'i State law HRS §195D-4.5 (NMFS, 2015). Despite the protections granted to monk seals under these acts, monk seal populations continued to decline; the first official stock assessment found that Hawaiian monk seal populations decreased at a rate of 5% annually from 1985–1993 (Antonelis et al., 2006). At this time, the majority of the monk seal population was still located in the NWHI. The terrestrial habitat remained uninhabited by people during this time, except for a few government employees, although Native Hawaiians and fishers were able to access the waters of the NWHI for fishing, voyaging, and other purposes, as allowed. Since the early 2000s, the total population has shown stability or even increases, with a significant increase in monk seals in the MHI from 2010–2020 and a consistent annual growth rate of 2% from 2013–2020 (Antonelis et al., 2006; Carretta et al., 2022) (Figure 1). Estimates of monk seal populations from the National Marine Fisheries Service (NMFS) based on 2020 data were around 1,465 seals rangewide with the large majority of the population found in the NWHI and only 25% of the population located in the MHI (Carretta et al., 2022).

At the same time, the human population on the MHI has continued to grow steadily, increasing by 20% across all islands

between 2000–2020 (Gove et al., 2022), while tourist arrivals to the islands increased by nearly 50%, from just under 7 million visitors per year in the year 2000 to just over 10 million in 2019 (Hawaii DBEDT, 2000; Hawaii Tourism Authority, 2019). Given the monk seal population's growing numbers in areas of higher human density, encounters with humans on populous islands such as 'Oahu are increasing. The first documented birth of a monk seal on a popular Waikiki beach in 2017 was extensively covered in the press (McKenzie et al., 2020), and marked the start of an emerging trend. Monk seals now consistently haul out on highly visited 'Oahu beaches for resting and occasionally also pupping; four additional pups have been born (to two mothers) on the same beach in 2021, 2022, 2023, and 2024 (NOAA Fisheries, 2024). Encounters between people and monk seals have, in a few instances, resulted in physical harm and have been well documented in the news media, for instance when a swimmer has been bitten by a monk seal or a monk seal has been found shot in the head (McKenzie et al., 2020). As both monk seal and human populations continue to expand in the

MHI, it is critical to understand the social factors driving conflict over marine wildlife in order to anticipate and prevent future conflicts.

3 Materials and methods

A mixed methods approach was used to explore the perceptions and values driving conflict over monk seals and their management. To understand historical and contemporary monk seal management, human-monk seal interaction in Hawai'i, and the potential conflict associated with these, we reviewed literature including peer-reviewed publications, gray literature, and NOAA technical memos, reports, and internal documents related to monk seals and conflict. This included projects that involved both formal and informal interviews with diverse stakeholders, including members of the Native Hawaiian community. We also reviewed media coverage of monk seals to create a timeline of interactions

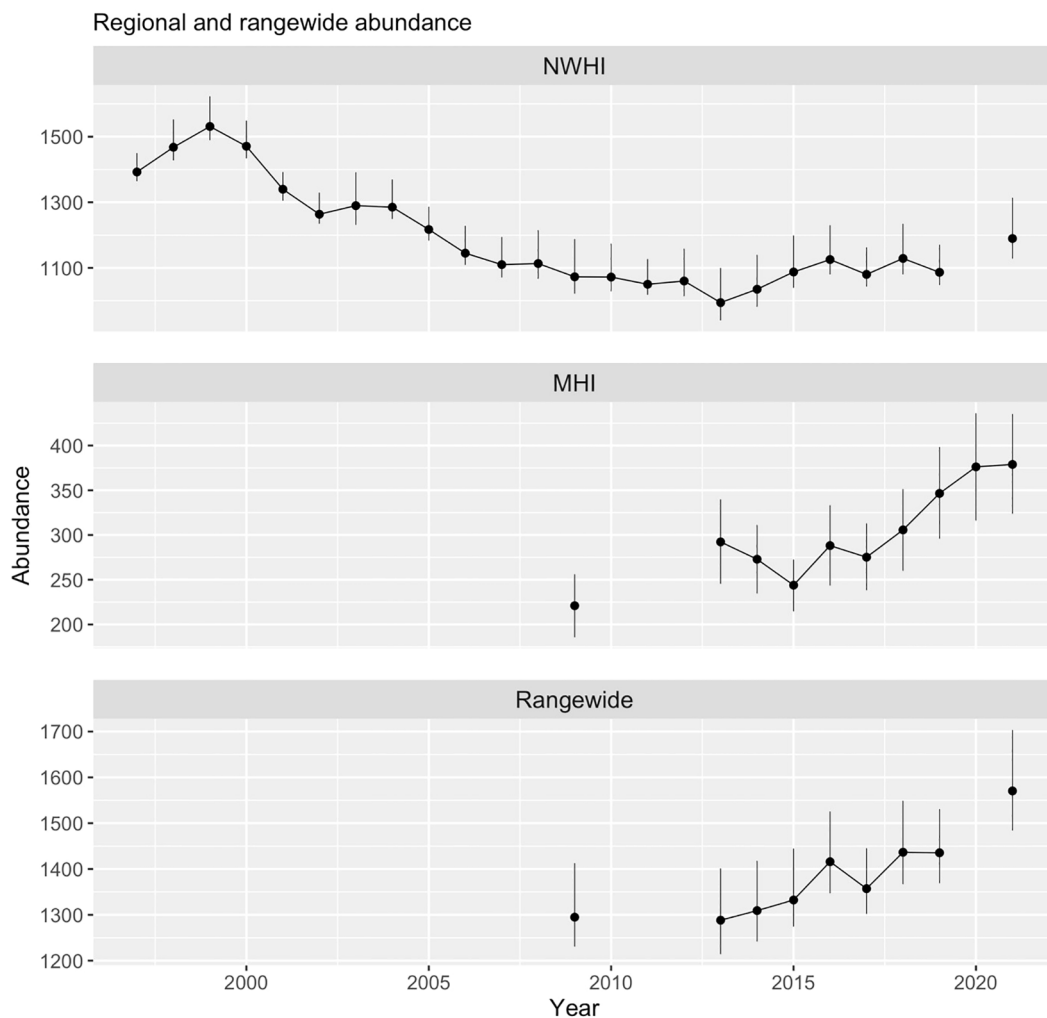


FIGURE 1
Regional and rangewide abundance trends for the Hawaiian monk seal population to 2021 (NOAA Fisheries, 2022).

between people and monk seals that resulted in physical harm, as well as to better understand how monk seals are portrayed in popular media.

In addition, we conducted semi-structured interviews between August and November of 2018. NOAA project partners identified initial interviewees and organizations based on their involvement with monk seal recovery in the past. They suggested state resource managers, federal resource managers and researchers, as well as representatives from volunteer organizations including Hawai'i Marine Animal Response (HMAR) and the Monk Seal Foundation, both of which have been involved in monk seal monitoring and outreach. Representatives from fisherman groups and lifeguards were also interviewed to understand a range of perspectives associated with monk seal conflict in the MHI. Where contact information for individuals was not known, public agency contact information was used, and snowball sampling was used to identify additional interviewees. A total of 20 interviews were completed with state managers (2), federal managers or researchers (9), fishermen (2), lifeguards (2), and monk seal volunteers (5). Interviews ranged from 30–70 minutes in duration. Interview questions focused on the interviewee's involvement and experiences with monk seals, observed interactions between people and monk seals, perceptions of reasons for conflict over monk seals, as well as their perception of the role monk seals should play in Hawaii and how they are personally affected by monk seals. Interviewees who were managers were also asked additional questions relating specifically to monk seal management. Fifteen of the interviews were recorded (with the subject's approval), transcribed, and analyzed using NVivo v12.5 software. Detailed notes were taken during interviews when the respondent did not agree to be recorded. Interview responses were analyzed using an inductive approach (Thomas, 2006), where initial themes were generated and then refined through iterative review of the data. Transcripts and notes were reviewed to identify themes relating to values and perceptions relevant to monk seals and their management. The first author conducted all coding for internal consistency using NVivo software. After three iterations of transcription analysis, preliminary codes were refined in consultation with the second author and condensed to reduce redundancy and focus on themes most relevant to the research objectives. Codes were also analyzed using NVivo to identify frequencies.

To gauge the broader public's perceptions of monk seals and their management, surveys were conducted on beaches where seals were present on the island of O'ahu, the most populous of the MHI. Beaches where seals were actively hauled out (and thus target sites for surveys) were identified by coordinating with NOAA and HMAR, the local non-profit that currently monitors the monk seal population throughout four sectors in O'ahu (North, South-East, South-West, and West). HMAR sector managers respond to a sighting hotline that is utilized for the public to report any sightings of monk seals across the island. Once monk seal presence was confirmed at a beach location, HMAR sector managers relayed the location of a hauled-out monk seal via phone call or text message, and an attempt was made to go to that beach and opportunistically

survey any individual who was present at a beach while the seal was also present.

People at beaches with a monk seal present were approached and asked to take a paper survey, with the goal of surveying as many people as possible. Surveys were conducted in English, which limited our ability to include some international visitors in the sample. Surveys included Likert-type scale and multiple-choice questions including basic demographics, reasons for beach visitation, reactions to seal's presence on the beach, and opinions of potential management responses to limit human interaction with monk seals. A total of 132 surveys were completed between July 19th and August 16th, 2018 at ten different beaches with seals present (Figure 2). All survey data were imported and normalized in a database using PSQL and analyzed using Excel and R v2023.03.1 + 466 software. All information collection and informed consent procedures were reviewed by the Institutional Review Board at San Diego State University and deemed exempt under protocol number HS-2018-0097.

As an author group, we also drew on our own expertise as individuals working to support the recovery of endangered marine species and as academics with a long history of studying conflict over wildlife. We have all been directly involved in efforts to understand and reduce conflict over seals and other forms of wildlife for multiple years and have engaged directly with diverse stakeholder groups on different sides of these conflicts as a part of participatory management processes. These experiences informed our analysis of the findings, provided insight into how our findings relate to broader themes in the human-wildlife conflict literature, and guided our discussion of paths toward addressing emerging conflicts.

4 Results and discussion

Here we present findings based on our review of government and media reports, stakeholder interviews, and beach-based surveys to better understand the drivers of conflict relating to the endangered Hawaiian monk seal in the MHI. We organize the results and discussion of this study by thematic areas relevant to conflict that have emerged from this research: emerging signs of conflict, polarized views of seals and what they represent, the role of media and social media platforms, and management intervention to prevent and address conflict. Within each of these thematic areas we discuss how values, environmental beliefs and perceptions, and other factors contribute to existing and future conflict.

4.1 Emerging signs of conflict

As both monk seal and human populations have increased in the MHI, so too have human-seal interactions (Figure 3). These interactions began to be documented in the media as early as 2004 with the report of a monk seal biting a tourist swimming off of the Island of Kauai and a few other incidents of monk seals

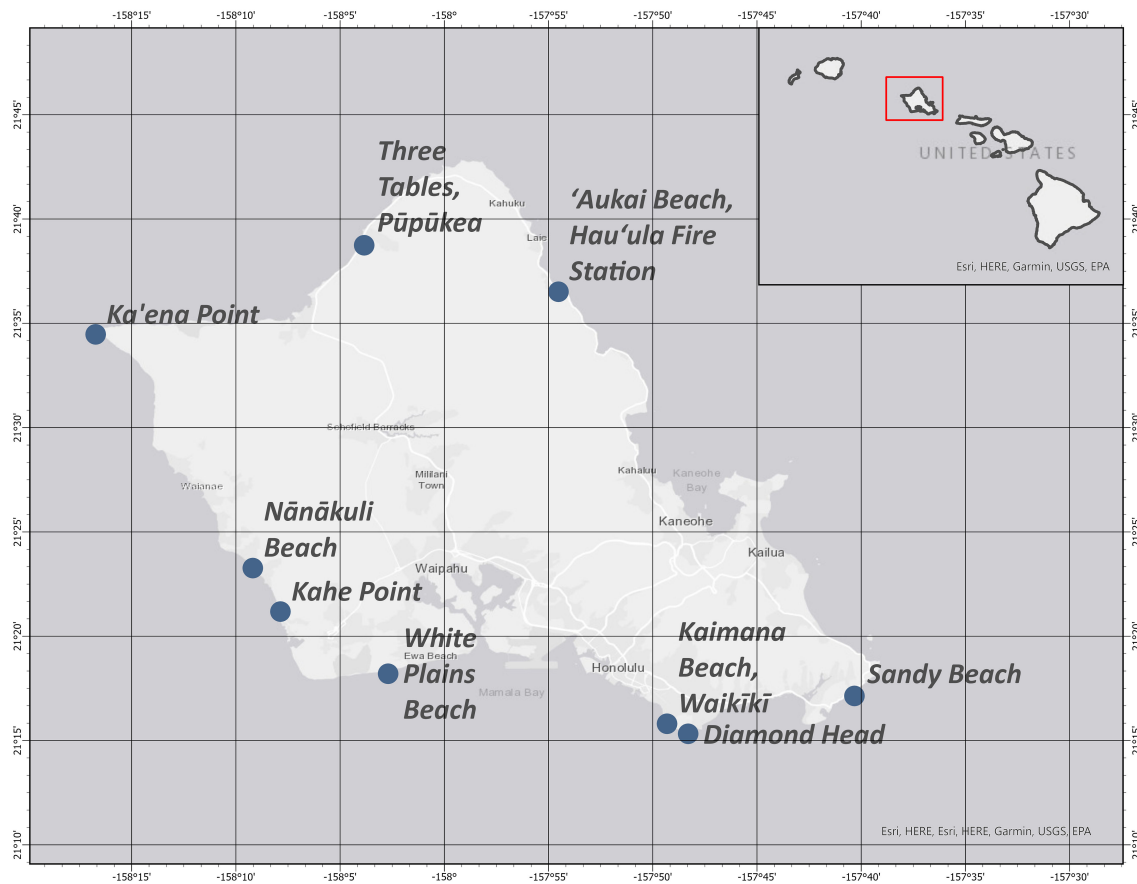


FIGURE 2
Survey locations on O'ahu, Hawai'i.

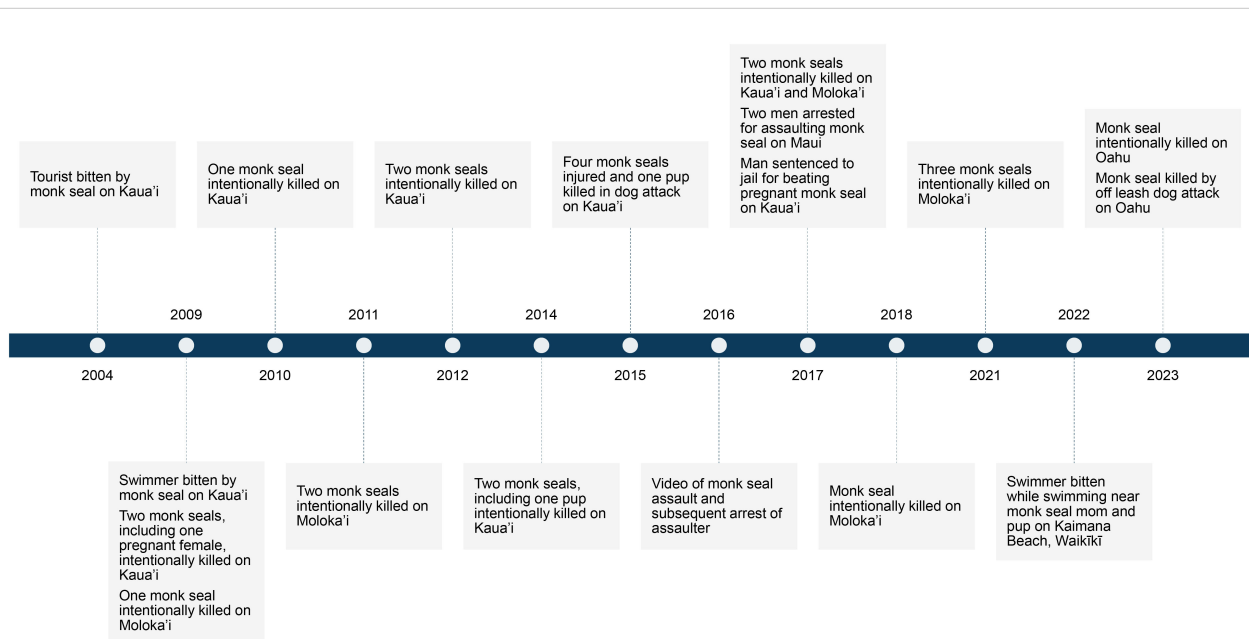


FIGURE 3
Timeline of notable events relating to interactions between humans and monk seals in the MHI that resulted in physical harm.

harming swimmers since then. Concern over these interactions grew after a number of intentional killings and assaults on seals occurred in 2009, 2011, 2012, 2016, and 2018 (Carretta et al., 2019). Many of the intentional killings occurred in areas where monk seals were in direct competition for resources with humans, especially fish, as opposed to the historical killings of monk seals in sealing expeditions that occurred prior to ESA and MMPA protections. Although these intentional monk seal killings are believed to be isolated occurrences, a single death can have a large impact on a species whose population is already critically low, especially if it involves a reproductive aged female.

Despite the recent history of negative interactions with monk seals, media coverage of monk seals tends to be largely positive (McKenzie et al., 2020). Similarly, our survey respondents reported an overall positive perception of monk seals. Of the 132 people surveyed on O'ahu, 79% of respondents expressed a very positive reaction to the monk seal's presence on the beach, and 75% expressed very positive reactions to monk seals pupping more frequently in the MHI over the past 25 years (Figure 4). No respondents stated that they had "very negative" reactions, and very few expressed "somewhat negative" or mixed positive and negative reactions to monk seals. Survey respondents included a mix of Hawai'i residents and non-residents, with just over 61% of respondents stating they were a resident of the islands. While a higher percentage of non-residents expressed positive views toward seals than Hawai'i residents (92% positive vs. 83% positive, respectively), the difference in perception was not statistically significant ($\chi^2(1) = 1.66, p = 0.20$).

Survey responses also indicated support for current management measures intended to limit interactions between people and monk seals that are hauled out on a beach. The majority of respondents rated all measures currently used by volunteers and managers as either very appropriate or somewhat appropriate (Figure 5). These measures include educational or cautionary signs, as well as roping or fencing off sections of the beach when seals are present. Beach closures, which are not currently used as a management approach, were the only type of management action that was seen as appropriate by less than half of survey respondents. Perceptions of

Hawai'i residents and non-residents were not significantly different in terms of how they perceived seals or most management measures, with the exception that Hawai'i residents were more likely to state that beach closures were very or somewhat appropriate (48%) than non-residents (33%) ($\chi^2(2) = 6.755, p = 0.03$).

The overwhelmingly positive perceptions evident from the survey data belies the evidence in Figure 3 that a prolonged conflict exists around monk seals, and the fact that some people feel strongly enough to kill monk seals. Konrad and Levine (2021), similarly found that while beachgoers in La Jolla, California were overwhelmingly positive about harbor seals pupping on a local beach, a protracted controversy over seals' use of the beach proved challenging to resolve because it had evolved into a deep-rooted, identity based conflict between small polarized groups of local residents with strong feelings in support or in opposition to seals using the local beach.

4.2 What is a monk seal?

Similarly, interviews and secondary data reviewed for this study illustrated that the conflict over monk seals in Hawai'i is not driven by the general public observing or interacting with monk seals on the beach, but by polarized groups who have strong feelings about seals and what they represent (Figure 6). On one side are people who see monk seals as vulnerable animals in need of protection and part of Hawaiian culture, with individuals willing to go to great lengths to help ensure their survival as individuals and as a species. Others view monk seals as competitors for resources or invaders that are not a part of Hawaiian culture or identity, yet receive preferential treatment from the government. Drawing on interviews and secondary source documents, we provide an overview of how these differing perceptions interact to create conflict.

4.2.1 Monk seals are vulnerable animals in need of protection

A considerable network of volunteers coordinates with NOAA to aid in monitoring and managing the presence of monk seals on

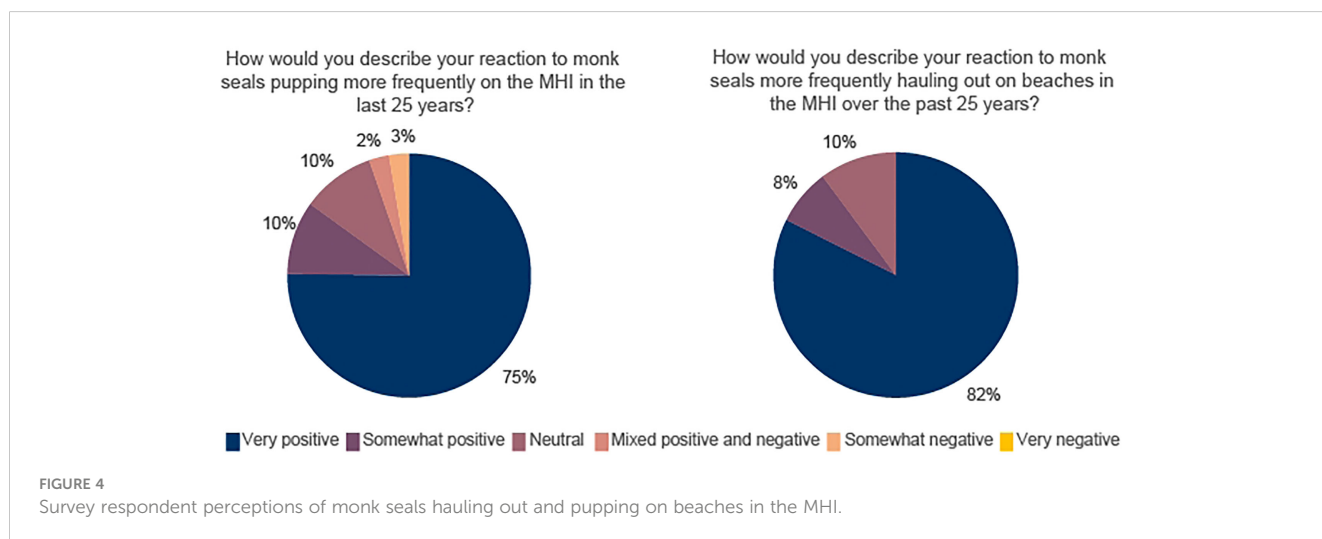




FIGURE 5 Survey respondent perceptions of the appropriateness of different strategies to limit human interactions with monk seals hauled out on beaches in Hawai'i.

beaches throughout the MHI. These volunteers dedicate significant amounts of their own time to supporting monk seal protection and monitoring. Although volunteer organizations have changed over time, the current organization active on Oahu is HMAR. These

volunteers are part of a monk seal sightings network and visit beaches where monk seals have been reported to have hauled out. Upon reaching the beach, they determine what level of management is necessary for the situation. Seal Resting Areas (SRAs) are then

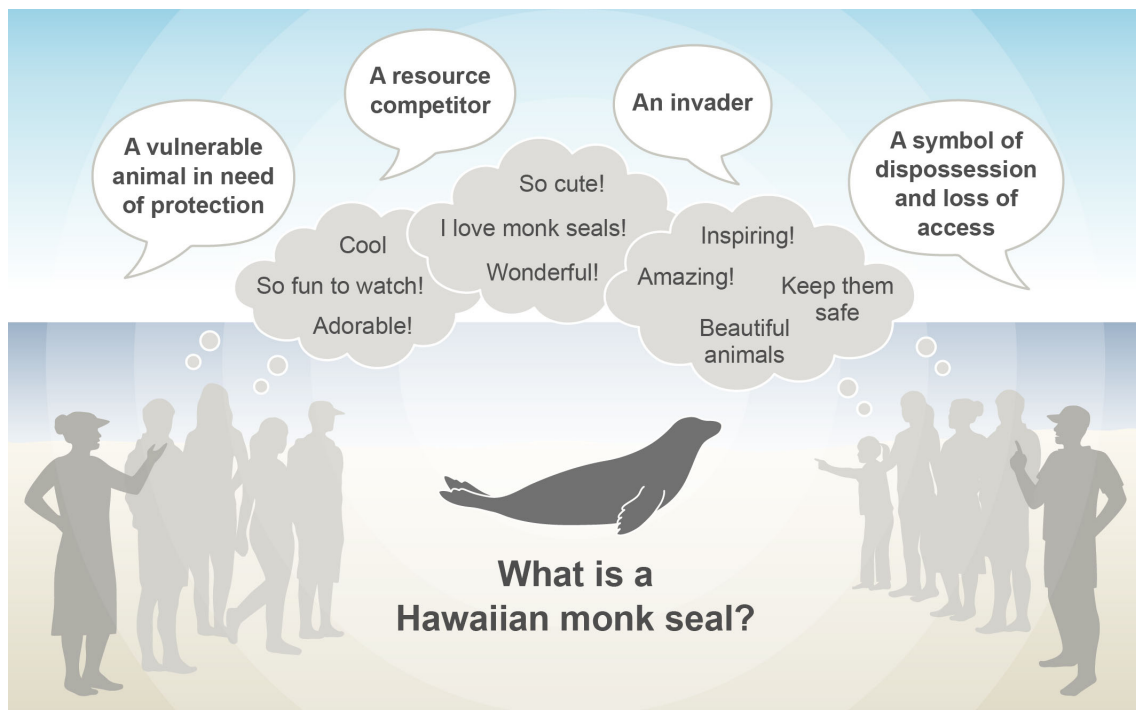


FIGURE 6 While most individuals at beaches where monk seals are present have positive perceptions of seals, conflicting social constructions of seals and what they represent drive conflict over monk seals. In this figure, text in the thought bubbles are representative of comments provided on surveys of people at beaches with monk seals. Speech bubbles represent the different narratives about monk seals and what they represent that emerged in our research and which drive conflict between people over monk seals.

established and managed by the volunteers in order to limit direct human interaction with monk seals. Actions taken at SRAs range from placing signs on the beach to using cones, ropes, and/or mesh fencing to establish a barrier around the seal. Volunteers then remain near the SRA and educate the public about monk seals and responsible wildlife viewing practices.

The volunteers interviewed expressed that they engaged in volunteer activities because of their love for monk seals, and they often expressed a strong emotional connection to the animal. One longtime volunteer stated, “[I] love them. They’re an innocent victim in man’s modern world, struggling to survive.” These strong emotions highlight a feeling of needing to protect this endangered species that was echoed in the other sources we examined. Because of their deep emotional investment in the monk seal populations, some volunteers confront beachgoers about behavior they see as threatening to seals. For instance, in some cases where beachgoers have approached or attempted to touch or engage with resting seals, volunteers perceived these interactions to be inappropriate and as potential seal harassment and responded with strong words directed at the individual interacting with the seal. These types of negative interactions can, in some cases, cause beachgoers to associate the negative interaction with the hauled-out monk seal itself, and volunteer guidelines discourage this type of behavior for this reason. One federal monk seal manager explained the unintended impact these interactions can have:

“They [volunteers] are the people that most of these people are going to talk to, they’re not going to talk to NOAA, they’re not going to talk to the state, but they’re going to talk to the volunteers who, regardless of how we tried to separate and all of that sort of stuff and make sure that people understand they’re a separate entity, they represent everything that is monk seals and they can create real animosity ... those people may never see that volunteer again, or volunteers at all, but they might see another monk seal, right?”

Managers are aware of the emotions and concerns that volunteers have. Historically, management of human-monk seal interactions centered on preventing harm to monk seals and trying to limit negative human-seal interactions. As sentiment towards monk seals has changed, new challenges are arising. When discussing this shift, a federal monk seal manager stated, “now we actually kind of have the opposite problem, where people are overly protective of the monk seal and have a tendency to project human thoughts, emotions, and characteristics on them.” This has presented management challenges, as some have interpreted federal actions designed to minimize interactions (such as relocating weaned pups away from populated beaches) as upsetting to the monk seal mother and pup, when in reality monk seals do not form long-term maternal bonds.

However, HMAR volunteers are also at the front line of conflict prevention, playing a critical role in educating the public about monk seals and safe viewing guidelines, which may help prevent interaction that could lead to potential harm, including unsafe interactions with

an endangered species and potential seal aggression toward humans. The two lifeguards interviewed, who regularly observe interactions between people and seals while on duty, both emphasized the importance of volunteer actions to educate beach-goers about seals, given that the public does not necessarily know what are safe or legally appropriate ways to interact with seals. They emphasized the importance of SRAs, which are established by HMAR volunteers, and the use of ropes to prevent the types of interactions that they sometimes observe, such as throwing objects at seals, approaching them, and trying to touch or slap them, all of which are illegal and potentially dangerous.

HMAR volunteers’ strong sense of connection to wildlife is common among conservation volunteers, who generally express strong feelings of connection to nature, often with a personal or spiritual connection that influences their behavior (Guiney and Oberhauser, 2009), and conservation volunteerism has been found to be strongly connected to volunteers’ sense of personal identity (Fraser et al., 2009). It is common for conservation volunteers to identify with the animals they see themselves as protecting from the destructive impact of humanity on nature (Abell, 2013; Konrad and Levine, 2021). This self-identification as protectors of nature drives HMAR volunteers to spend considerable time and energy assisting in efforts to prevent unsafe interactions with monk seals in Hawai‘i. However, the intense feelings that volunteers have about seals can also contribute to conflicts, particularly when volunteers see the behavior of others as violating their own deeply held conservation values (Markle, 2022).

4.2.2 Monk seals are resource competitors

The perception of threats to livelihood, culture, recreation, and identity may drive negative perceptions of monk seals among some of those who identify as fishermen throughout the MHI, as outlined in Madge (2016). From a survey done in 2011, 43% of those who answered “yes” to the question “Do you fish regularly” believed the presence of monk seals reduces fish catch (SRGII, 2011). Our study reinforces these findings. A volunteer who assists with monk seal surveys on the island of Molokai discussed the pressures of resource competition and the negative perceptions of interactions, by stating:

“Things are very expensive on Molokai. A lot of people live sustainably, between fishing and hunting ... But if you’re laying a net and then a monk seal will eat the fish out of the net, they will wreck your net. I mean there are reasons why fishermen don’t like them.”

In the MHI, monk seal killings were first documented as early as 2009 when a man fatally shot and killed a pregnant monk seal on the North Shore of Kaua‘i (D’Angelo, 2014). From 2009, there have been at least sixteen killings of monk seals on the islands of Molokai, Kaua‘i, and O‘ahu in which monk seals have died as a result of either a gunshot or significant trauma to the skull (D’Angelo, 2014; Carretta et al., 2022; Honore, 2023; Johanos, 2023a; 2023b, 2023c; Harting et al., 2020). Given the species’ already small population, sixteen killings in 13 years threatens recovery (Harting et al., 2021).

Managers and media have stated that killings may be in part motivated by perceived fishing competition, where a focus on threats to fishing may drive this retaliatory behavior (Mooallem, 2013). It is well known that when people see wildlife as competition for resources or a threat to their livelihoods, it can result in hostile attitudes towards wildlife and, in some cases, retaliatory killings of animals (Don Carlos et al., 2009; Liu et al., 2011). This dynamic has been documented for many species in many contexts, where successful management requires attention to the social drivers of these conflicts (Herda-Rapp and Goedeke, 2005; Hill et al., 2017).

4.2.3 Monk seals are a symbol of dispossession and loss of access

Given their endangered status and protection under the ESA and MMPA, the Hawaiian monk seal is subject to strong federal protections through regulatory actions, a Recovery Plan, and Critical Habitat designations. However, the extensive government intervention in protecting this endangered species has served to heighten distrust among some Hawai'i residents. Given the colonial history of Hawai'i and dispossession of many from their Indigenous lands, some Native Hawaiians do not trust the government. Similarly, many fishermen (who may or may not also identify as Native Hawaiian), have lost access to historic fishing grounds or fishing privileges due to state or federal regulations and the establishment of marine reserves, generating similar feelings of distrust. As one federal protected species manager explained, "There is a lot of understandable distrust, animosity, and angst when it comes to federal government management." This history of disputes and distrust has served to deepen feelings of resentment for a species that is protected and regulated by a federal agency. The association of Native Hawaiian identity and identity as a fisherman as part of this conflict deepens the level of conflict, making it more challenging to resolve (Sprague and Draheim, 2015).

Fishing is deeply rooted in Hawaiian culture, and some Native Hawaiians as well as fishermen see fishing regulations established for monk seal protection to be a symbol of federal regulation and control, threatening the identity of both Hawaiians and fishermen. The regulations represent the loss of access to natural resources that Hawaiian people historically relied on. Some fishermen view the monk seal as a species that the federal government uses to control people's behavior and take away access to fishing sites; the monk seal therefore receives animosity that is actually aimed at federal government actions. As one fisherman interviewed stated:

"It's a true perception from the fisherman here. Especially bottom fisherman who had Northwestern Hawaiian Island permits, closing it [to create a Marine National] Monument pushed fisherman out. They used the monk seal as leverage to close it down ... Federal laws and the state are the ones that screw us. With the Hawaiian monk seal management plan, fishermen don't want to talk to people about it because everything we told them we wanted to protect, they took it [as protected areas that fishermen could not access]. Fishermen are burnt."

These conflicts are compounded by the perception that the state and federal government care more for the Hawaiian monk seal than the Hawaiian people. One federal manager explained how a historical management action, taken without sensitivity to local perceptions, may have reinforced mistrust:

"I mean, initially when we had some seal killings, the idea was to put out rewards, and then we had a situation on Kaua'i where the reward money for information about a dead monk seal exceeded that which was put in place for a missing child. And that's where the whole [idea comes from, that] you care more about the monk seals than the people."

Another federal monk seal manager explained the challenges that come from the disproportionate funding dedicated to monk seal management and recovery versus social concern on the islands, stating,

"One of the big issues is, why are millions of dollars going towards saving this animal when we still have homeless people? We still have water quality issues or whatever. So it's definitely a challenging environment."

The history of government mistrust, felt by both those identifying as fishermen and those identifying as Native Hawaiian, underlies much of the public animosity toward monk seals. This deep-rooted identity-based conflict goes beyond just human interaction with the seals themselves, making these conflicts more difficult to manage and mitigate (Madden and McQuinn, 2014). Others have described how conflicts over wildlife become a symbol or surrogate for broader issues. For example, spotted owls and Key deer hung in effigy as protests to development constraints, sparrows as a nativist symbol of human immigration, doves representing rural values, or wolves representing issues ranging from land use to tribal authority (Nie, 1999; Herda-Rapp and Marotz, 2005; Peterson et al., 2010). As such, the retaliatory killings may be less about impacts from monk seals themselves, and more about what the seals represent.

4.2.4 Monk seals are invaders

Exacerbating many multi-generational Hawai'i residents' distrust of federal monk seal management policies is the fact that older generations of Hawaiians had little to no awareness of or experience with monk seals until recently, with only 7 recorded monk seal sightings on the MHI between 1928 and 1956. Although remains dating back to 1400–1750 A.D document the presence of Hawaiian monk seals on the island of Hawai'i, misperceptions exist regarding whether monk seals are native to the MHI (Watson et al., 2011). One fisherman expressed skepticism during an interview regarding whether monk seals were historically present on the islands, stating,

“When I first saw [a monk seal], I was twelve, 1992. I was raised at the beach. I’d see turtles but only heard about monk seals, heard people talk about them. Why didn’t I see one before?”

The perception that monk seals are not native to the MHI, and that their presence there is not natural but caused by government intervention, influences how people view and value seals. Mistrust of the government compounds these misperceptions, and some individuals believe that the federal government brought monk seals from the NWHI to colonize the MHI. This perception stems, in part, from historical management actions that one NOAA manager explains:

“So, not only did people have this misperception that they aren’t from here, I don’t know if you know this story but in the 90s we brought some male seals from the Northwesterns because there was a skewed sex ratio [among the monk seal population in the NWHI], and so they were injuring females severely as they were all trying to mate with the same female, [and] they were killing juveniles. So, we brought some males down here. There were already seals here and there was a lower ratio of males here, so to correct that, we brought them down. But there wasn’t very good media and outreach done so people actually thought that not only were monk seals invasive, they thought we [the federal government] brought them here. So that’s been an interesting one and it’s been very hard to correct.”

The perception that monk seals’ presence on the MHI is due primarily to government intervention has been difficult for NOAA managers to overcome. Public mistrust of the federal government often supersedes efforts by NOAA to correct misperceptions about monk seal natural history. Thus, some who oppose monk seal presence in the MHI do so in part because of a perception that monk seals are an invasive species brought by the federal government that creates fishing competition and provides a justification for putting federal regulations into place to limit fishing and Hawaiian practices.

These perceptions relate to the phenomenon of shifting baselines (Soga and Gaston, 2018), where recovery goals are based on historical populations and distributions of monk seals that predate the experience of current human populations whose expectations and normative understanding of “baseline” conditions did not include monk seals in the MHI. In addition, others have demonstrated that the concept of invasiveness is not static nor agreed upon, both among scientists and between scientists and publics (Boonman-Berson et al., 2014; Crowley et al., 2017). From a risk perception perspective, the associations of monk seals as both a new and human-made risk to residents also indicate high outrage factors, which are more difficult to address than if the risk were associated only with the probability of harm (Yoe, 2019; Kasperson et al., 2022). Appropriate attention to the deep-value and identity issues associated with these perspectives will be crucial.

4.2.5 Social construction of monk seals

The diverse meanings attached to monk seals illustrate four distinct social constructs of monk seals that are also deeply tied to conflicting identities (Figure 6). Like many other enduring conflicts over wildlife, conflicts surrounding the Hawaiian monk seal have become symbolic of other meanings that are important or threatening to the values and identities of different groups involved in the conflict, where the conflict is less about the animal itself and more about what it represents (Nie, 1999; Herda-Rapp and Goedeke, 2005; Peterson et al., 2010; Madden and McQuinn, 2014; Leong et al., 2020). Some volunteers for island-based non-profit groups personally identify as protectors of this endangered species, form deep emotional attachment to the seals, and see monk seals as innocent victims of destructive human impacts on the environment. The fishermen concerned about monk seals, on the other hand, see seals as resource competitors and as symbolic of federal government restrictions on their rights and access to natural resources. Native Hawaiians who have negative views of seals often see them as invaders in their native homeland, brought by the same federal government that historically disenfranchised Hawaiians from their land, and see federal actions to protect seals as a continuation of colonial restrictions on Native Hawaiian rights and access.

Where there is the perception that protected habitats and species are seen as more valuable than the people living with those species, retaliation against the animal is often retaliation against what are viewed as conservation injustices (Western, 1994; Holmes, 2007). As multiple knowledge systems and worldviews gain wider recognition, many of the core tenets of wildlife conservation are now coming into question as stemming from the same cultural assumptions and processes that fueled colonial expansion (Dominguez and Luoma, 2020; Hessami et al., 2021). Acknowledgment of these multiple experiences and assumptions about the meanings of wildlife and their conservation is necessary to reconcile a long history of threats to people’s values and identity, which for some are embodied by Hawaiian monk seal management.

4.3 Role of media and social media platforms

Compounding these issues is the emerging challenge of social media and media-driven influences on perceptions of wildlife, their management, and any surrounding conflict. Social media can spread information as well as misinformation, and the global reach of social media platforms expands the base of people engaged in wildlife management to include individuals from all over the world who pressure local resource managers to take particular actions. This spread of information has fostered both positive and negative perceptions of monk seals. The attention gained from the media coverage of Kaimana, the first monk seal pup born in Waikiki in the summer of 2017, fostered strong positive perceptions and emotional connections amongst a broad base of the public.

Yet, this attention also increased the spotlight on management actions and the likelihood that such actions would be critiqued. An example of this can also be seen through the media coverage when Kaimana was relocated after she was weaned and Rocky (her mother) had left, to reduce her exposure to people and potential for habituation, which can be dangerous for both people and monk seals. Discussions regarding the relocation of Kaimana included projection of human emotions onto monk seals, as expressed by a federal monk seal manager:

“When we moved Kaimana everyone was like, ‘Rocky’s going to be sad. Kaimana is going to be sad.’ Everyone said, ‘she’s going to be missing her pup, you guys are messing with this mother pup bond.’ It was really hard to get the point across that monk seals don’t have that [enduring type of bond].”

Social media groups in support of monk seals as well as social media groups for fishermen have perpetuated different types of misinformation while reinforcing equally strong emotions. Managers described pro-monk seal social media groups where members engage in conversations about their love of monk seals, as well as the “injustices” occurring against the population. These one-sided conversations serve to reinforce strong feelings and sometimes encourage emotional behavior. This is similarly seen in fishermen’s groups where one-sided emotional discourse against monk seals occurs, compounded by the opinions of significant individuals seen as “influencers.”

Along with a spread of information and increase in pressure from those who felt personally connected to monk seals, these platforms can also prompt undesirable behavior and foster perceptions that can negatively impact management progress and fuel conflict. One fisherman interviewed explained,

“I think it’s a huge mistake for, especially the television media, to go and take videos of monk seals. All it does is it encourages tourists to go and take pictures and interact with them. And I cringe when I see a newscaster say how cute they are and things like that. To make them like cuddly animals. They’re dangerous animals.”

An HMAR volunteer also expressed concerns about how selfie culture, related to social media postings, influenced people’s interactions with seals:

“I mean selfies and cellphones are the worst thing that could ever have happened with wildlife. Whether it’s a bison in Yellowstone, or whatever ... there is no common sense with animals. Everybody thinks it’s a pet, all warm and cuddly, and it’s just not true. A mother monk seal will eat you.”

The media has long played a role in shaping the public agenda, or the issues that people see as salient, a concept known as agenda-setting (Johnson, 2013). While early studies focused on broad public

salience, with the proliferation of social media platforms, attention is shifting to individual level salience (Yi and Wang, 2022). Further, social media incentivizes misinformation and moral outrage rather than search for a global consensus (Kasperson et al., 2022). The degree to which conservation practitioners engage in communication in media platforms can affect conservation action and policy creation for endangered species (Soulier, 2022). The dominant support for monk seals in traditional news media aligns with manager perspectives. In social media channels, however, multiple conflicting perspectives endure. Whether and how managers engage with communication channels preferred by those who view monk seals as victims, as resource competitors, as symbols of dispossession, or as invasive species will affect the nature of how these groups engage with Hawaiian monk seal management in the future.

4.4 Management interventions to prevent and address conflict

Monk seal recovery efforts have, for the most part, taken action early and often through strategic outreach, education, and adaptive management approaches. For instance, managers have worked with volunteer groups to reduce the potential for negative interactions between overzealous volunteers and beach-goers. One federal manager discussed this adaptation in their management approach:

“I think the approach that we’ve taken with seal protection zones that I was talking about; we now call them seal resting areas. You know we’ve issued these guidelines to the volunteers that you’re not protecting the seals. That’s a 500-pound animal with big teeth, it doesn’t need you to protect it. You’re an ambassador for it and you’re bringing the attention to the public. Yeah there’s a seal here let me teach you about it, not there’s a seal here let me run you away from it. And I think that’s been really successful and again, harder to quantify because it’s not a hard data thing, but we can see that a lot of the positive sentiment is due to that.”

Another example of outreach efforts is a project where cameras were placed on monk seals in the wild, which substantially improved understanding of the Hawaiian monk seal foraging landscape and behavior (Parrish and Littnan, 2007). Footage was taken to local schools and in some instances, students were able to directly participate in analyzing the footage alongside the scientific team. Students would count the amount and species of fish being eaten and not eaten by monk seals, allowing them to learn for themselves about monk seal foraging behavior and share what they learned with those in their community. Managers believed this program showed some success in addressing conflict with fishermen through correcting misperceptions about scale of competition for resources. While this type of education and outreach can address surface level disputes over monk seal diet and behavior, education in and of itself has been found to be insufficient in promoting enduring behavior change, which are also

guided by social norms (Schultz, 2011). Education and outreach approaches are also limited in their ability to address identity-based drivers of beliefs about monk seals, for instance, when someone's identity as a fisherman is threatened by a new competitor for resources, regardless of the scale of the actual competition. To address these deeper levels of conflict, approaches based on improving dialogue and trust can improve outcomes (Madden and McQuinn, 2014; Draheim et al., 2015; Hill et al., 2017; Frank et al., 2019).

Monk seal managers and scientists have been working to overcome public mistrust of the government by engaging with communities transparently and providing opportunities for public involvement in research activities and in advising management policies. One federal manager described this priority by stating,

“I absolutely am committed to just speaking the truth, right? So you will get some people that will try to say the easy thing, but even if it gets me yelled at, I'm going to tell them exactly what I think, what the science says or what is likely going to happen, so that at no point, you may not like my message, but you're never going to not trust.”

Managers have also worked to increase public trust by broadening the types of people included in recovery planning conversations. The team involved in developing and conceptualizing the Main Hawaiian Islands Monk Seal Management Plan was composed of individuals not only associated with government agencies, but instead included Hawaiian cultural leaders, fishermen, scientists, and educators (NMFS, 2015).

These management efforts have aimed to help address areas of concern, particularly mistrust of government, in an attempt to bridge the gap between federal management decisions and the concerns of local stakeholders. These early efforts to intervene could help to prevent conflict escalation in the future. Continuing these efforts and adapting them to anticipate and address new issues as they arise may be instrumental in preventing deeper conflict in the future (Crowley et al., 2017).

Lessons from the field of risk communication can also help determine when to use different strategies to engage with publics that perceive different levels of hazard and outrage relating to monk seals. The main risks to people on beaches would be potential injury from interactions with monk seals. In this situation, both hazard (likelihood of harm) and outrage (differential perceptions of harm) are generally low. On the other hand, perceived risks to fishermen and other local residents appeared to activate many outrage factors, e.g. when monk seals were seen as a new, man-made risk that unfairly affected some populations more than others. Yoe (2019) outlined guidance to apply Peter Sandman's¹ framework for selecting different risk communication strategies based on hazard and outrage. In situations of low hazard and low outrage, such as with general publics on beaches, a public relations approach is

appropriate. When potential for hazards is higher but outrage is still low, precaution advocacy is appropriate, such as warning people to keep their distance at beaches and pay special attention when females with pups are present. High hazard and high outrage indicates crisis or emergency communication, which is rarely needed for monk seal management. Instead, the low (but persistent) hazard and high outrage situation is prevalent for most monk seal conflicts. This is the most challenging situation, which will require different approaches based on acknowledging and engaging with the specific values and identities of the people involved.

5 Conclusion

Our case study reinforces and extends patterns seen in previous research on Hawaiian monk seal recovery efforts. Although the broader public's perceptions of monk seals in Hawai'i are largely positive, the persistence of challenging conflicts with people who view monk seals as something other than an animal in need of protection continues to impede successful recovery and coexistence. Our study illustrates the role of social construction, deep-value identity conflicts, and aspects of risk communication in driving these conflicts. These findings mirror work on invasive species conflicts by Crowley et al. (2017) that suggest that aspects of the social context, approach to management, and communication can affect conflict development. They provide principles, tools, and strategies to anticipate and respond to these drivers of conflict, which apply equally to endangered species recovery:

1. Pay explicit attention to socio-ecological considerations and contexts, including research into previous management and participatory social assessments,
2. Use deliberative or democratic approaches to community engagement and management delivery,
3. Use open and honest communication that seeks feedback and responds constructively.

These approaches are especially important when hazards are low and outrage is high, which is when destructive conflicts were seen in our study, and which in our experience forms the basis of most human-wildlife conflicts driven by deep-value differences. This is often related to conflicting meanings attached to wildlife species that are becoming more common, whether they are endangered species like the Hawaiian monk seal that have become legally protected, common species adapting to urban environments, or domestic animals adapting to live without human support (e.g., feral animals). Endangered species recovery creates this potential for conflict by intentionally seeking to increase the population of rare animals. Thus, paradoxically, success in recovering endangered species means an increased likelihood of conflict over that species, as was observed by Williams et al. (2002) for wolves. Because people's lifestyles, values, and identities have been developed in a context where the species is rare, these conflicts have a high potential of becoming protracted and deep-rooted as increased human-wildlife interactions and government

¹ <https://www.psandman.com>

interventions to protect wildlife change how people live with and think about wildlife, but there is not yet a societally uniform understanding of wildlife in that context (Leong, 2009).

Decker et al. (2011) refer to this phenomenon as subsequent impacts of management which occur *because* management objectives have been achieved. Redpath et al. (2015) go one step further, arguing that managers and conservationists often act as antagonists by promoting wildlife recovery as a priority, which may conflict with the goals and perspectives of those who view wildlife through a different lens. An understanding of this dynamic that can emerge as a result of endangered species recovery efforts is crucial to navigating out of destructive conflicts to achieve recovery and coexistence. The IUCN (2023) provides useful guidance for managers working to address human-wildlife conflict, and also urges practitioners to reflect on their own role in the conflicts, recognizing that human-wildlife conflicts are almost always underpinned by social conflicts between people. Ultimately, it is important for managers to articulate their own assumptions and values, and to work to understand the assumptions and values of those who may be affected by species recovery, to anticipate potential subsequent impacts and develop proactive mitigating actions (Decker et al., 2011). In recovering endangered species, it is critical to do this *before* conservation success is achieved, and to draw on existing guidelines to prevent potential conflict when identities are threatened and worldviews may not align.

6 Limitations and future research

Our study drew from multiple data sources and perspectives to understand the drivers of conflict over Hawaiian monk seals. We had limited perspectives drawn directly from members of the Native Hawaiian and fishing communities, and future research could engage more deeply with these populations to understand the nuanced perspectives involved, and how these perspectives may contribute to ongoing conflict or conflict mitigation. Our survey aimed to understand perspectives of people on beaches who had the potential to interact with monk seals, but the highly positive skew of perspectives amongst those on beaches with monk seals limited our ability to use the survey to understand differences between those who perceived seals in a negative vs. positive light. For this reason we relied on interviews and other sources to provide insight into the drivers of conflict over monk seals.

We chose to focus this study primarily on conflict over monk seals on the island of O'ahu, yet there is also evidence of deep-value identity conflicts on other Hawaiian islands such as Moloka'i and Kaua'i. Research that collaboratively engages in dialogues about perceptions of monk seals and their recovery will be necessary to address these conflicts, with an explicit goal of helping decision-makers understand how their actions, assumptions, and priorities might contribute to conflicts. In addition, while we observed conflicts linked to perceptions of outrage factors, it is unclear

whether these perceptions developed as reactions to other perceptions of harm or vice versa. Is there higher outrage because monk seals were perceived as new or human-caused invaders, or did these ideas develop because of negative emotional reactions to management? Finally, future research may examine our hypothesis that human-wildlife conflicts stem from species becoming more common. For example, how universal is this observation, and which characteristics of species or management context play more prominent roles? Without attention to these additional potential drivers, managers should anticipate future conflicts will accompany recovery of marine mammals and other protected species.

Data availability statement

The datasets presented in this article are not readily available because interviews are confidential based on IRB protocol. Anonymized survey data may be shared at author's discretion. Requests to access the datasets should be directed to alevine@sdsu.edu.

Ethics statement

The studies involving humans were approved by San Diego State University Institutional Review Board (protocol #HS-2018-0097). The studies were conducted in accordance with the local legislation and institutional requirements. The ethics committee/institutional review board waived the requirement of written informed consent for participation from the participants or the participants' legal guardians/next of kin because verbal informed consent was given.

Author contributions

LK: Funding acquisition, Methodology, Project administration, Writing – original draft, Writing – review & editing, Data curation, Formal analysis, Investigation, Visualization. AL: Formal analysis, Methodology, Project administration, Writing – original draft, Writing – review & editing, Conceptualization, Funding acquisition, Resources, Supervision. KL: Conceptualization, Writing – original draft, Writing – review & editing. FK: Validation, Writing – review & editing.

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