

**Understanding stakeholders' perspectives of urban
southern sea otters (*Enhydra lutris nereis*)
and the perceived conservation challenges in
Monterey Bay, California.**

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by

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Abstract

Human wildlife conflict has become a common occurrence in urban areas due to humans encroaching into wildlife habitat. Wildlife value orientations form the basis for individual behaviour in wildlife-related context and can be used as a conservation tool to help facilitate communication between stakeholder affected by issues related to human-wildlife interactions. Historically, the southern sea otter (*Enhydra lutris nereis*) population was limited by conflict with the fishing industry, although currently the conflict has been solved to some extent. This study aimed to understand stakeholders' perception of urban southern sea otters and perceived conservation challenges in Monterey Bay, California. Semi-structured interviews were conducted with four major groups: members of the public, researchers, fishing community and tour operators. The results suggest a general mutualistic wildlife value orientation among stakeholder groups and an overall tolerance for sea otters in urban areas. A diversity of perceived conservation challenges was noted, predominantly humans impacting sea otters and their habitat and stakeholder interactions. Results from this study help further understanding regarding global wildlife values as part of a social-ecological systems approach, by examining how stakeholder's perception differs but shows an overall mutualistic ideology in an environment shared by humans and wildlife.

Keywords; Wildlife value orientations; southern sea otters; Urban; Conservation challenges; perception

Introduction

As urbanisation increases across the globe, it is impacting the ecology of many wildlife species. Urban areas contain novel anthropogenic resources for wildlife that can be exploited as they adapt, but this can increase the potential for human-wildlife conflict (Lewis *et al.*, 2015). Conflict may result in economic losses, property damage or human injury and the mitigation of these conflicts has become an important aspect of urban wildlife conservation (Lewis *et al.*, 2015). These interactions can alter social acceptance towards problematic wildlife, reinforce or create new conflicts among stakeholders, and/or initiate discussions regarding land use equality (Cerri *et al.*, 2017; Redpath *et al.*, 2013; Bradley & Altizer, 2007). The context that shapes these interactions can include multiple, engrained

levels of internal and external ecological and social processes that can range from ecosystem- and society level induced, down to individual attributes of humans (e.g. values) and wildlife (e.g. physiological conditions) (Laverty *et al.*, 2019).

Values are described as “a basic pattern of thought formed early in life that guide behaviour over a wide array of situations and events” (Rohan, 2000, p. 257). Wildlife value orientations (WVOs), serve to strengthen and give distinct meaning to more basic values in regard to wildlife and form the basis for individual behaviour in wildlife-related context (Teel & Manfredi, 2009). For example, understanding WVOs has helped to recognise challenges facing shark conservation, by identifying which stakeholders are likely to aid in conservation as well as highlight conflict that hinders effective conservation efforts (Drymon & Scyphers, 2017). Commonly, studies focus on two core value orientations (VOs): mutualism and domination. Mutualism emphasizes caring and equality for wildlife, and individuals show a greater empathy for animal welfare and wildlife-focused interests (e.g. habitat protection). Domination prioritizes human well-being over wildlife and shows less tolerance of animals when it competes with human interests, as well as showing greater support for management actions (Teel & Manfredi, 2009). In addition to these two VOs, studies have found other broad classification of thought about wildlife, such as attraction/interest and scientific orientations (Teel *et al.*, 2007; Laverty *et al.*, 2019). The attraction/interest orientation has been associated with a desire to watch wildlife in their natural habitat, while the scientific/rational orientation is tied to examples of natural behaviour and how the world works (Teel *et al.*, 2007; Laverty *et al.*, 2019).

Understanding these orientations can explain variation in behaviours and attitudes across a diversity of wildlife-related topics, such as those involving trade-offs between wildlife protection and human interest (Cerri *et al.*, 2017).

The historical range of southern sea otters (*Enhydra lutris nereis*) in California has been the focus of conservation efforts due to the widespread extirpation and reduction of their population in the 18th and 19th century because of the fur trade (Jessup *et al.*, 2004; Lafferty & Tinker, 2014). Since then the population has steadily grown, but their population recovery was hindered in the 1960s due to conflict with fishermen resulting in sea otter mortality (Jessup *et al.*, 2004). This conflict was due to resource competition of the unnaturally high abundance of shellfish that had resulted from the sea otter’s protracted absence (Carswell *et al.*, 2015). Since 1977, sea otters have been protected under California law and the sea otter-

shellfisheries conflict has been managed by moving many fisheries away from common sea otter habitats (Jessup *et al.*, 2004). Although the conflict is not fully resolved, the current discord has cooled and many Californians are now very protective of sea otters (Carswell *et al.*, 2015). Thus, it is important to examine how sea otter population size increase may affect stakeholders' attitude towards these marine predators. This study defines stakeholders as “the individuals or groups involved, interested in, or affected positively or negatively” (Aas *et al.*, 2005, p. 31) by southern sea otters (Echeverri *et al.*, 2017). Differences in perceptions among stakeholders can be impacted by their values, economic, ecological or cultural references, potentially formed through past experiences (Adewumi *et al.*, 2019; Xu *et al.*, 2006). It is becoming increasingly important to include different social backgrounds in management strategies as a lack of such contextualization in local environmental issues could lead to failure in solving or preventing conservation problems. By utilizing wildlife value orientation types as a conservation tool, it could help facilitate dialogue regarding issues related to human-wildlife interactions.

This study aimed to understand stakeholders' perception towards urban southern sea otters in Monterey Bay, California. Using semi-structured interviews with four major groups: members of the public, researchers, fishing community and tour operators, the results could give an overview of how different stakeholders points of interests can be implemented in future management plans, while still trying to maintain an adequate level of conservation for the species.

Methods

Study area

The study was conducted in Monterey Bay, California from June until August 2019. The study site was defined as the whole of the central coast communities, with the county-seat city of Santa Cruz located at the northern end of the bay and the city of Monterey at the southern end of the bay (Figure 1). California is currently leading the United States in conserving ocean heritage by creating a state-wide system of marine protected areas (MPAs). These areas carefully monitor and manage human activity in and around the marine environment. They differ in size and allow varying types of use depending upon their conservation goals (Larson *et al.*, 2014; NOAA, 2019).

The central coast of California is used by many different people. Marinas and harbours are home to fishing communities such as commercial fishermen and aquaculture farms, as well as members of the public that live on boats docked in the harbour. The coast also draws in a large number of tourists every year and in 2018 the tourism industry injected \$2.98 billion into the local economy (MCCVB, 2019). The MPAs are frequented by boat traffic as well as marine recreationalists such as kayakers, surfers and sailors. Southern sea otters have been a big draw for the tourism industry and recreational users as otters reside all along Monterey Bay, including a particularly high concentration in the local MPA, Elkhorn Slough (Elkhorn Slough, 2019).



Figure 1. The study site defined as encompassing the whole of the central coast communities from Santa Cruz at the northern end to Monterey at the southern end. Study area indicated by the red line. Image adapted from Pajaro Dune Destinations. 2018

Data Collection

The qualitative data collection approach used in this study, consisted of face-to-face, semi-structured interviews (see appendixes). The study used a snowball sampling method to identify potential participant after directly contacting at least one member of each stakeholder group directly through email. At the end of each interview, the author asked the participants to provide suggestions of individuals to contact from any or all the stakeholder groups.

Interviews typically occurred at the participant's place of work or in public areas. The questions focused specifically on sea otters in urban environments and were designed so they could be answered by participants of all ages. Pilot interviews were conducted at the beginning of the study with 1 member from each of the stakeholder groups in order to ensure the questions were appropriate and covered all aspects of the study. Following the pilot interviews the questions did not change, thus those interviews could be used in the final analysis. The interviews were recorded on an encrypted dictaphone and stored on password protected files, after receiving formal consent from each participant. All interviews were audio recorded except for one who allowed for an interview but rejected a recording. Interview lengths ranged from 2 minutes to 40 minutes for the full suite of questions, with some participants having no view or information regarding certain questions, thus resulting in shorter interviews. All interviews were transcribed verbatim by the author from the audio recordings or from notes.

In order to measure wildlife value orientations, the author adapted the questions from the cross-cultural interview guide developed by Dayer *et al.*, (2007). This guide relies on basic human emotions and can be universally understood across cultures and designed to elicit stories regarding wildlife through emotional prompts. Specifically, these questions ask participants for depictions of personal experience with sea otters that made them happy, sad and frustrated in addition to their feelings towards the current population size in Monterey Bay to understand their tolerance of the species. Phrasing of the answers will indicate the stakeholders WVOs which will be grouped into observed VO categories. Three additional questions were asked to understand perceived conservation challenges and solutions to human-wildlife coexistence.

Analysis

In order to analyse wildlife value orientation data, the author transcribed and coded the interview responses using NVivo (NVivo qualitative data analysis software; QSR International Pty Ltd. Version 12, 2018), using existing studies on wildlife value orientations as guides for creating and grouping codes into axial categories (i.e. Laverty *et al.*, 2019). The research objectives were used to integrate, organise and refine axial codes into broader theoretical categories, or selective codes. The author generated a list of themes, with passages selected to contain a group of VOs and corresponding belief measurements (i.e. sets of basic beliefs; Teel & Manfredi, 2009) identified through the interviews. For answers regarding

questions on perceived conservation challenges and solutions, the author compiled and grouped the challenges mentioned into 4 broad categories. Direct quotes were used to provide more context for interpretation of interview responses and to examine potential differences in reported interactions across stakeholder groups.

Results

Wildlife value orientations

In total, the author conducted 38 interviews, 10 interviews for each stakeholder group, except for the fishing community who only had 8 contributors due to difficulty finding willing participants. Participant ages ranged from 13 to 70 years old. The interview responses (N=38) primarily suggested mutualistic WVOs, with themes present in 58% of all stakeholder interviews (Table 1). Statements suggesting a significant level of care for sea otters and concern for their safety were frequently identified belief dimensions for this orientation. Personal examples most often included sympathy for dead, sick or injured sea otters that participants personally observed. Responses included willingness to share the urban environment and its resources with sea otters and noted the importance of how near-shore ecosystems benefit from sea otters.

Table 1. Wildlife value orientations and belief dimensions from a 2019 interview of stakeholder groups in Monterey Bay, N=38

Domination	Example quotation from interviews
Economic gain	
<i>Employment</i>	“Our Elkhorn Slough location has the highest concentration of sea otters anywhere and it's one of the main draws for our business and so as an ecotourism company we know that that's an important resource for us.”
<i>Tourism</i>	“People are coming to Monterey hoping to see sea otters underwater when you do run into one underwater, they are just cruising around and feeding and that just made my entire tours weekend”
<u>Concern for human safety</u>	“There was a diver that was cleaning the boat and she showed us her fin and it had a bite mark and she said that it was made by a sea otter”
<u>Concern for pet safety</u>	“There was one day when an otter came up onto the dock, went under the boat and grabbed the dog by the nose and drowned it in the water.”
<u>Concern for property</u>	“I have seen sea otters chewing through my dock lines, and not just mine but others, and I don't know what to do about it”
<u>Competing for resources</u>	“For years you haven't seen people combing the beaches for Pismo clams and a lot of people think that damage is due to the otters and they think that a lot of abalone devastation in certain areas is due to sea otters.”
Mutualistic	
<u>Caring</u>	“That is always sad that the animals you have been watching for years, and you have collected a lot of data or watched them rear a lot of pups eventually gets sick and dies.”
<u>Respect</u>	“They are welcome here and I hope we are because they were here first.”
<u>Sharing resources</u>	“I feel like I might bother them more when I take crabs. Sometimes they'll go into my box and take a couple of crabs out. And I feel like I'm paying king Neptune back.”
<u>Concern for sea otter safety</u>	“When we see causes of death directly caused by people, boat strikes, gunshot cases or net entanglements that kind of weighs on me and makes me feel sad because humans are either intentionally or unintentionally harming wildlife because we are infringing on their habitat.”
Attraction/Interest	
<u>For self</u>	“Something that made me happy is I love seeing the sea otter moms carrying their babies around with them.”
Scientific/Rational	“The emotion of sadness is tempered by the ecology of the species interaction, predator prey interactions.”

Stakeholders did vary with the level of mutualism VOs present in the interviews (Figure 2.) Mutualistic VOs were observed in 60% of researchers (N=10), members of the public (N=10) and tour operator (N=10) interviews, while it was present in 50% of the fishing industries

(N=8) answers. Fewer interviews expressed domination WVOs, with the theme being present in 40% of the interviews. In those instances, participants expressed concerns over human and pet safety, stating that otters are aggressive and have been known to attack dogs and humans if they get too close. Another predominant theme was economic gains from sea otter sightings or interactions on tours, suggesting that sea otters are one of the main attractions for tourists in the area. Furthermore, fishermen mentioned that having sea otters in the area benefited their yields as they supported a healthy ecosystem. Researchers did not have any instances of dominating WVOs while members of the public (N=10) only expressed those values in 30% of their interviews. Tourism agencies (N=10) were found to express dominating VO in 60% of their interviews and the fishing industry 75%. Interest or attraction was a commonly expressed VO, with 58% of all interview groups mentioning a positive experience viewing sea otters. Members of the public expressed the highest interest/attraction VO, present in 70% of the interviews, followed by researchers (60%) and tour agencies (60%), and the fishing industry (37%). A scientific/rational VO was detected in 32% of interviews. Researchers were found to express this VO in 90% of interviews and members from the fishing industry were found to express this 13% of the time. Scientific VOs were found in 10% of the interviews from members of the public and tour operators.

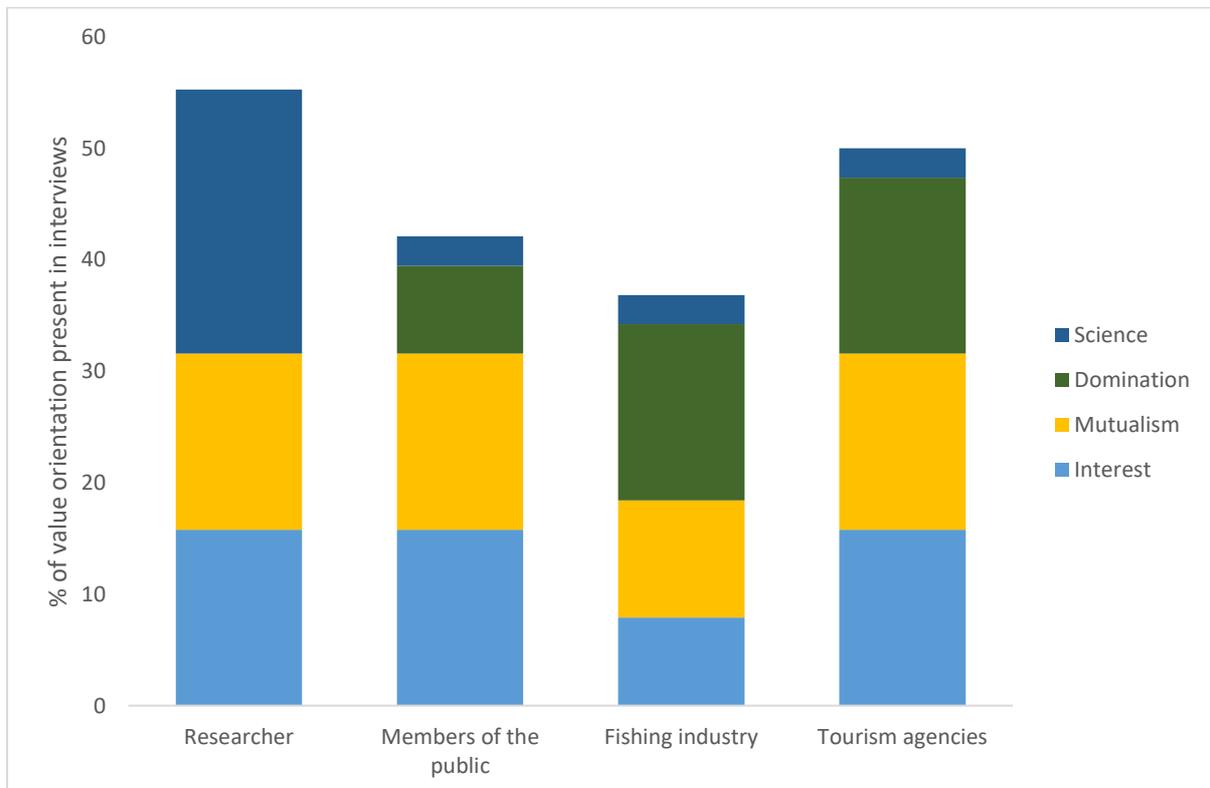


Figure 2. Wildlife value orientations regarding urban southern sea otters present in stakeholder interviews from Monterey Bay, California, 2019. N=38

Interactions and tolerance of sea otters in urban areas

Variation was found in stakeholder groups' experience interactions with sea otters (Figure 3, N=38). When asked about happy, sad and frustrating experiences relating to sea otters, 97% of all interviews included happy experiences. Researchers (N=10) commonly noted happy experiences working with sea otters but most stakeholder groups expressed happy experiences observing sea otters in their natural habitat, for example a fisherman (N=8) recounted "I like watching them and sometimes they take little shells and bang them on the boat". Sad experiences were expressed in 66% of interviews, commonly mentioning dead or injured sea otters and pups. However, 31% said they did not have any sad experiences. When asked about frustrating experiences, 29% recounted frustrating experiences working with sea otters, with most examples coming from researchers who mentioned frustration collecting field data. Other examples included dealing with the species (24%), with members of the public (N=10) and tour operators (N=10) noting sea otters damaging property. Frustration regarding human impact on sea otters was found in 21% of the interviews and 31% of the participants said they did not have a frustrating experience with sea otters.

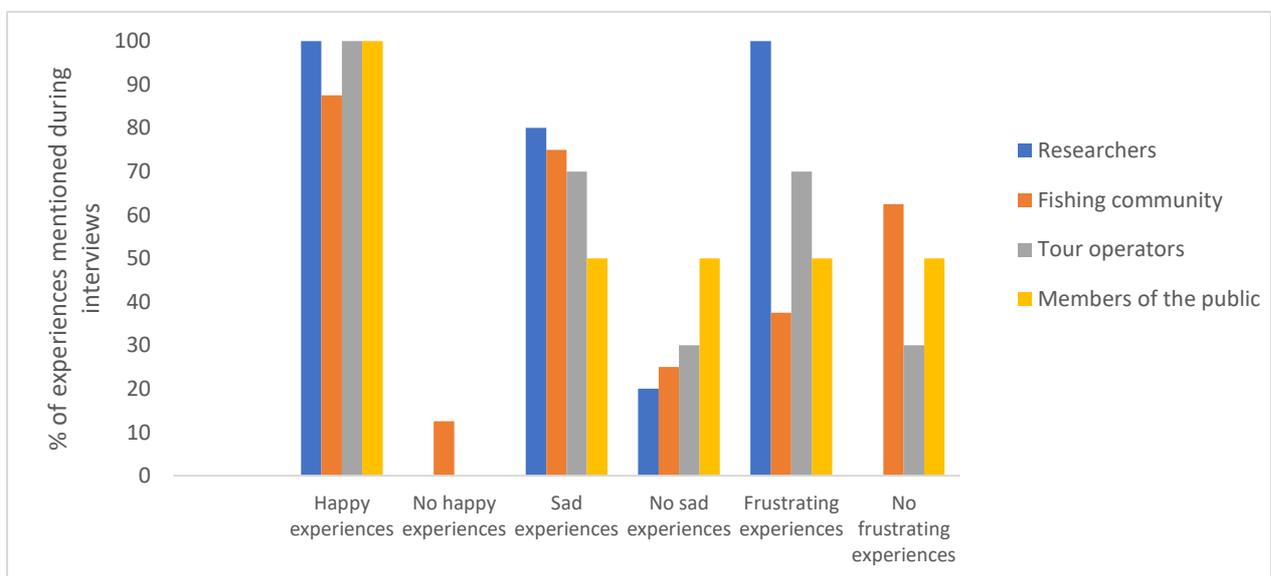


Figure 3. Stakeholders recounted experience with sea otters during interviews N=38.

When asked about what participants thought of the southern sea otter population size in Monterey Bay, of those that answered (N=33), most were tolerant of the size (Figure 4). The most common answer (78%), especially for members of the public (N=9), stated that they

would like to see more sea otters in the area or to see their range expand. No stakeholder group stated that there were too many sea otters. Another common answer, especially among scientists (22%, N=9), classed as other, was based on scientific evaluation of the current population size (15%), recounting new population estimates rather than stating their personal views on the population size. Finally, 16% of participants, most commonly the fishing community (N=6), did not know or did not feel qualified to answer the question about the population size. 1 researcher, tour agent (N=9) and members of the public, said they would like to see the population stay constant, noting that the population was at equilibrium and thus did not need more individuals.

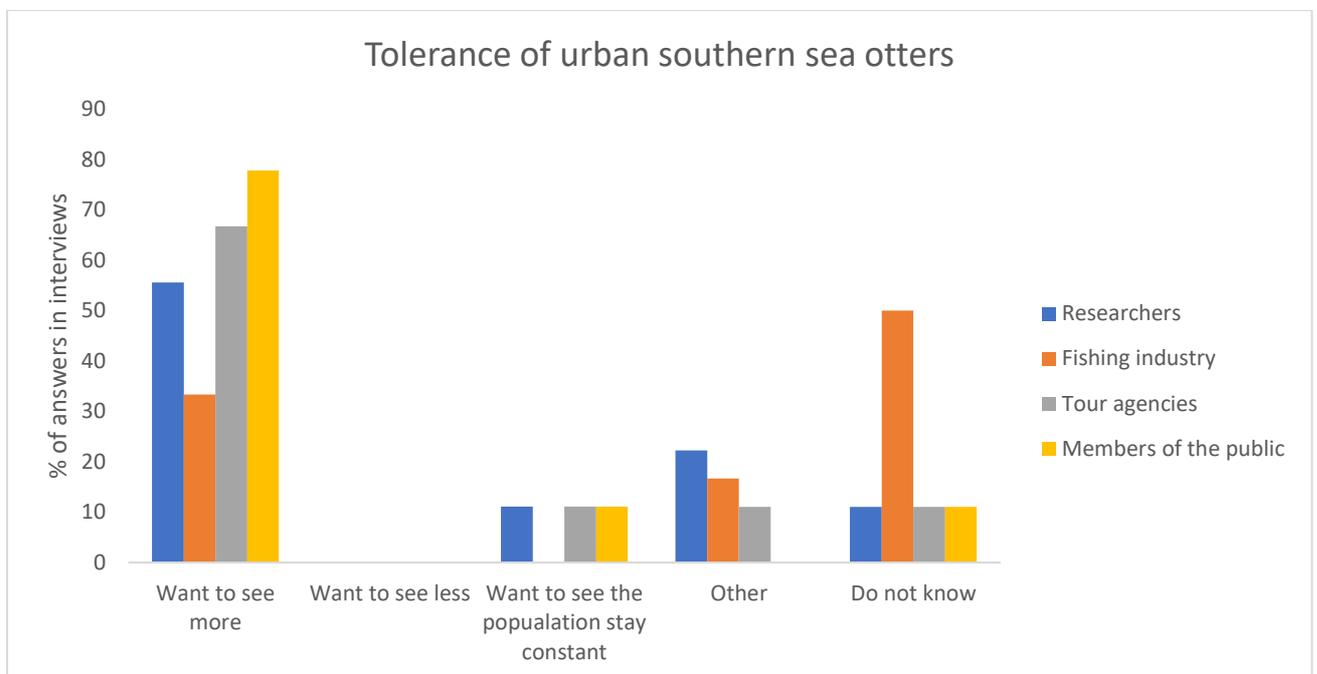


Figure 4. Tolerance of urban sea otters in Monterey Bay, California as expressed by 4 stakeholder groups, researchers, tourism operators, members of the public and the fishing community (N=33).

Conservation challenges cohabiting with urban wildlife

Participants (N=38) suggested 21 different conservation challenges facing cohabiting with urban wildlife which were compiled into 6 different themes (Table 2). The most commonly reported challenges (54%) were due to human disturbance, which consisted of recreational users getting too close to otters, pollutants (chemicals and pathogens), provisioning by humans, boat strikes, roadkill accidents, animal abuse, pet disturbance and human overpopulation. This was commonly reported by members of the public (N=10), researchers (N=10) and tour agencies (N=10). Challenges sharing resources, such as

competition for food, encroachment and navigating harbours containing sea otters were found in 10% of all interviews. Sea otters negatively interacting with humans such as aggression towards humans and damage to property was found within 5% of all interviews, predominantly mentioned by tour agencies. The challenges mentioned within this theme were sea otters damaging property (kayaks, floats, chipping paint). Conflict between stakeholders, such as disputing over land use, strict sea otter protection laws and strict regulations for fishermen and aquaculture was mentioned in 8% of the interviews, predominantly by the fishing community (N=8). Challenges stemming from habituation such as diminished anti-predator responses were reported in 8% of all interviews, appearing most often in interviews with researchers, the fishing industry and members of the public. Participants noted that “the otters let the humans get so close because they've gotten so habituated to them”. Other wildlife, predominantly Californian sea lions (*Zalophus californianus*), were referred to as a challenge in 8% of the interviews, with the majority of them mentioned by the fishing community saying that “cause trouble in the harbour, restricting access to boats and ruining docks”. Finally, 7% of interviews said there were no challenges or did not know if there were any challenges facing cohabiting with urban wildlife.

Proposed solutions to the previously mentioned conservation challenges were more variable (Table 2). Most frequently mentioned across all interviews was increased education and outreach (38%), with this being the main resolution recommended by researchers (80%) and tour agencies (70%). Participants said that these educational programs should be aimed at tourists that want to recreate in sea otter habitat. The fishing industry’s main suggestion was increased communication between stakeholders such as, discussion of new, inclusive regulations. Members of the public most commonly said they did not know how to mitigate the challenges proposed or said that they did not know of any challenges in general (40%).

Table 2. Frequency of instances participants mentioned specific conservation challenges facing cohabiting with urban sea otters and their proposed solutions in 2019 interviews by different stakeholder groups. Participants often mentioned more than one challenge or solution within each interview. Highlighted rank within each stakeholder group showing the most common answer within the group.

Frequency of mentions in interviews (%)					
Conservation challenges	Researchers	Fishing industry	Tour agencies	Members of the public	Mentions in all interviews
Human disturbance	45%	5%	42%	26%	54%
Sea otters negatively interacting with humans	3%	0%	8%	0%	5%
Sharing resources	11%	3%	5%	3%	10%
Habituation	5%	5%	3%	5%	8%
Stakeholder conflict	5%	11%	5%	0%	8%
Other wildlife	0%	8%	5%	5%	8%
Do not know/ No challenges	3%	5%	5%	3%	7%
Proposed Solutions					
Education and outreach	80%	0%	70%	30%	38%
Stakeholder communication	0%	25%	10%	0%	6%
Quota and additional tests for recreational users	10%	13%	10%	0%	6%
Added protection	10%	13%	10%	20%	8%
Do not know/ No challenges	10%	0%	10%	40%	13%

Discussion

The general observed trend of stakeholders' perception of urban sea otters showed a higher percentage of mutualistic than domination WVOs across all interviews, with participants showing a general tolerance for the species, although these did vary between stakeholder groups. The mutualistic WVOs were emphasized by notions of compassion, equality, respect and caring. Studies have suggested that there have been population-level

shifts in 19 states in the Western United states from dominating to mutualistic WVOs (Manfredo *et al.*, 2009). This has been thought to reflect changes in the nature of social life in North America, as a result of modernization, leading to tendencies towards anthropomorphism, growing needs for affiliation in urbanized societies and alleviated emphasis on existence needs (Manfredo *et al.*, 2009; Teel & Manfredo, 2009). As seen in the study, many participants understood the role of sea otters as keystone species in the ecosystem, which could explain the shift from previous conflict with sea otters to an increased tolerance of the species. Furthermore, humans have begun to observe wildlife as deserving of equal consideration (Manfredo *et al.*, 2009), which could also be linked to biodiversity conservation issues gaining prominence in the media (Ogunjinmi *et al.*, 2013; Wilson & Tisdell, 2003; Wu *et al.*, 2018) and thus reaching a wider audience. However, a dominating orientation was also detected in 40% of all interviews, mentioning economic gains and concerns for safety and resource destruction. The extent of this value also differed between stakeholders with the fishing community and tour operators mentioning it most frequently. This variation between groups could stem from the fact that each group stands to gain different levels of use from sea otters. A lack of dominating WVOs in the researcher interviews could be the result of their VOs stemming from a scientific understanding of the natural world and how it operates. This would explain why most researchers that participated were found to express their perceptions more often through scientific explanations rather than assigning emotions to certain stories and situations. The fishing community, tour operators and members of the public, expressed concerns for human safety and damage to property by sea otters. Surveys conducted in urban areas in the USA and in Europe revealed that 20% to over 60% of respondents have reported wildlife-related problems at some point (Soulsbury & White, 2016). Although generally the relatively high frequency of reported problems could be reflective of a general perception that urban wildlife is a nuisance (Soulsbury & White, 2016), the general WVOs of stakeholders regarding sea otters seems to suggest otherwise, which might indicate a higher tolerance for damage inflicted by this species. Other studies have explored this complexity and found that residents in urban areas have a more positive attitude towards damage from wildlife and experiencing damage has not been found to be a dominant factor in determining attitudes (Kanski *et al.*, 2014). Regarding the concerns for safety, the study found that people often mentioned aggressive behaviour displayed by sea otters towards humans and pets. This form of conflict is likely to arise from defensive or territorial aggression, and usually resulting in no or only minor injuries to humans (Soulsbury

& White, 2016). Although these attacks are rare, the consequences of such interactions can shape future negative attitudes and perceptions of urban wildlife.

Participants identified a great diversity of perceived conservation challenges and solutions to cohabiting with urban wildlife in Monterey Bay. The most frequently mentioned challenge was human disturbance to sea otters, specifically individuals getting in close proximity with the species through marine recreational use (e.g. boats, kayaks). Tours or individuals observing wildlife at close proximity, such as directly on the water, have grown in popularity in the last several decades (Burgin & Hardiman, 2014). Although the main objective of these interactions is to observe and protect animals in their natural habitat, anthropogenic (human induced) interactions have been found to have a detrimental impact on wildlife health and behaviour (Harris *et al.*, 2012; Blanc *et al.*, 2006; de Sousa Pais *et al.*, 2018). However, the trend from these interviews shows that members of the public frequently mentioned interest as a VO. These stakeholders already make up 33.8% of the economic gains in Monterey and could increase the demand for wildlife tours and close up encounters (MCCVB, 2019). The most commonly mentioned solution among 3 stakeholder groups (researchers, members of the public and tour operators) to this challenge was increased education and outreach to the public and tour operators that deal with recreational users. Studies have found that tourists that are educated during mediated encounters with marine wildlife, e.g. during tours, does contribute to pro-environmental attitudes and improved on-site behaviour changes (Zeppel & Muloin, 2008). However, this solution could be limited by the difficulty reaching those individuals that have short-term visits and engage in independent recreational activities, and thus are exposed to limited or no educational material. Resource competition was mentioned most frequently by researchers and tour operators, who highlighted encroachment and navigating around sea otters in urban marine. Boat strikes were often mentioned and instances of mortality resulting from strikes has been observed in a number of necropsies (Kreuder *et al.*, 2003). Added protection as a potential solution was suggested and studies have suggested that enforcing speed restrictions in certain zones has led to an effective way to reduce collision risks (Calleson & Frohlich, 2007; Laist & Shaw, 2006). This method has been successful for the Florida manatee (*Trichechus manatus latirostris*), as added protection in manatee habitat resulted in reduction of human-related injury and mortality due to propeller and boat strikes (Laist & Shaw, 2006). Thus, further studies could investigate whether such restrictions could minimize sea otter mortality due to boat strikes in Monterey Bay.

Challenges revolving around the priorities of different stakeholder groups involved was mentioned mostly by the fishing community, focusing on strict laws and regulations regarding their practices in sea otter habitat. It has been common that conflicts intensify over time due to protected population increases, as they require a larger share of the contested natural resource, consequently leaving less available for human use or competing predator species (Rauschmayer *et al.*, 2008). The proposed solution to this problem was increased communication and consideration from parties involved in wildlife management. Studies have found that in order to minimize the negative impacts of successful conservation, there is a need for a shift from strict species protection to population management (Rauschmayer *et al.*, 2008; Lester *et al.*, 2017). Including stakeholders in decisions regarding species management and resource use, could lead to socially reliable negotiations and mitigations as all perspectives and wealth of information is considered (Rauschmayer *et al.*, 2008).

The results from this study help further understanding regarding global wildlife values as part of a social-ecological systems approach, explaining how stakeholder's perception differs but shows an overall mutualistic ideology in an environment shared by humans and wildlife. The qualitative approach used in this study also aided in identifying conservation challenges perceived by different stakeholder groups and how they see those challenges being resolved, furthering the understanding of the human-wildlife issues in the area, which could lead to a better coexistence. Future studies would benefit from implementing long-term monitoring of WVOs, as they could shift with social and ecological changes (Fulton & Manfredi, 1996). These results as a whole, create the basis for further research on the topic and could be used to facilitate more balanced policies that link to more broadly shared values, and thus contribute to the development of more effective and inclusive conservation initiatives.

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Conflict of interests

The study was conducted with the supervision of the Sea Otter Savvy organization which studies human disturbance on sea otters. However, the organization will only receive an anonymized report and any and all results will only reflect the current status of stakeholders' perception of urban southern sea otters. The organization has no financial involvement with the project.

Data Accessibility

Due to possible sensitivity of human subjects' data, interview files and transcriptions are only accessible by the author.

Ethics statement

Final interview procedures were approved for use with human subjects prior to implementation by University of Bristol, Faculty of Health Science Student Research Ethics Committee (HSSREC), reference: 87404.

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Appendixes:

Interview questions:

- Do you have a happy experience with sea otters? (Repeat with sad and frustrating)
- Do you think there are any challenges facing cohabiting with urban wildlife in Monterey Bay?
- How do you think these challenges could be mitigated?
- What do you think of the current sea otter population size in Monterey Bay?
- Do you have any suggestions for a relevant participant for this study?

Ethics Form:

Faculty of Health Sciences Research Ethics Committee

**APPLICATION FORM FOR ETHICAL APPROVAL
Reference Number (for office use):**

Date of Submission (for office use):



Title of the research:

1. **Understanding people's willingness to conserve sea otters in urban areas of Monterey Bay, California**
2. **Name of Applicant, with job title and contact details including email:**
Ragnheiður Rakel Dawn Hanson
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3. **Name of Supervisor (if applicant is a postgraduate or undergraduate student), with job title and contact details including email:**
Amanda Webber
awebber@bristolzoo.org.uk
4. **Other investigator(s) involved, with job title:**
Gena Bentall
gena@seaottersavvy.org
5. **Source of funding:**
Personal
6. **Start date and duration of the project:**
29. May 2019- 20. August. 2019
7. **Where will the study take place?**
Monterey bay, California
8. **Background and aims of the study:**
Over exploitation of natural resources is a major driver of biodiversity loss, and the general trend is to observe a significant decline in urban areas (Soulsbury & White, 2015). In California in the 1940s, many fishermen began to view sea otters as the reason for the depletion of the abalone stocks they were trying to exploit. By the 1960s, conflict between commercial abalone fisheries and sea otters began to gain the attention of politicians due to fishermen diminishing the sea otter populations through hunting (Carswell *et al.*, 2015). Currently, sea otters are protected under California law, however, the sea otter-shellfisheries conflict is now mitigated through “balance”, whereby one area of the California coast is used to support enough sea otters to forestall their extinction, and the other area is used to sustain commercial and sport fisheries (Carswell *et al.*, 2015). Although the conflict is not fully resolved, the current discord in California has cooled and many Californians are now very protective of sea otters (Carswell *et al.*, 2015). Thus, it is important to understand the interactions between humans and wildlife and how conservation successes may affect stakeholders' attitude

towards these marine predators in order to aid in the growth of the sea otter population in California. Human attitudes – “as learned predispositions to respond in a favorable or unfavorable manner with respect to a given object” (Fishbein & Ajzen, 1975) – gives a unique idea of how people can process information regarding the environment, and their willingness to conserve it. Understanding what impacts stakeholders’ attitudes towards biodiversity can have important implications for conservation as they can be either enhance or reduce the success of conservation management plans. (Echeverri *et al.*, 2017). Wildlife value orientations, which serves to strengthen and give personal meaning to more basic values in relation to wildlife, form the base for individual behavior in wildlife-related context. Studies have mainly focused on two core orientation: mutualism (emphasizing caring, equality and compassion for wildlife) and domination (prioritizing human well-being over wildlife). These orientations can be used to explain variation in behavior and attitudes across a diversity of wildlife-related issues, particularly those involving trade-offs between human interests and wildlife protection. Recent studies have suggested that there has been a shift from domination to mutualism in wildlife value orientations globally, which is in line with broader value shifts due to modernization (Laverty *et al.*, 2019). Thus, by integrating ecological and social knowledge into research and acknowledging the diversity of the factors that operate across these systems, it can lead to a more proactive and innovative solutions to conservation issues (Laverty & *et al.*, 2019).

The aim of this study is to examine different stakeholders’ attitudes towards conserving sea otters in urban areas of Monterey Bay, California. The study will use a semi-structured interview to understand different stake holders view on urban sea otters in the areas. This will give an overview of how different stake holders points of interests can be implemented in future management plans while still trying to maintain an adequate level of conservation for the sea otters.

9. Outline the design of the study and list the procedures to which the participants will be subjected, the anticipated testing time and any treatments administered:

The study will be conducted in Monterey Bay, California, using a qualitative study and interviewing different stakeholders on their perception of sea otters. Our qualitative data collection approach

- 10.** consists of face-to-face semi-structured interviews, which address our research question. We will attempt to interview 10 individuals from each of the 4 stakeholder groups, public, tourist operators, conservationists and individuals from fisheries in public areas. A topic guide has been developed before the interviews, however pilot interviews will be conducted with one individual from each stakeholder group to ensure the questions are appropriate and cover all aspects of the study. The interviews will be recorded on a dictaphone, after receiving formal consent from each participant. The recordings will be securely stored on password protected files. They will then be subsequently transcribed by the first author using NVivo.

The topic guide has been adapted from Laverty *et al* (2019) study, which relied on basic human emotions and designed to have the participants recount personal experiences with sea otters that has elicited an emotional response (happy, sad, angry and afraid) as well as describe how they feel about sea otters in urban environments in general.

Please outline how study data will be analysed.

In order analyze wildlife value orientation data, we will code the relevant responses for each interview without predetermined categories (i.e. inductive *in vivo* coding) with special attention given to repeated codes using the program NVivo. We will then use existing studies on wildlife value orientations as a guide for creating and grouping codes into axial categories. We will then use research objectives to integrate, refine, and organize axial codes into broader theoretical categories, or selective codes.

- 11. Does your study involve the collection or use of any human tissue or exudate? If yes, what is the material to be collected?**

No

12. **If you have answered ‘yes’ to Q11, has confirmation been obtained from your Departmental Human Tissue Act Advisor that collection and storage of this material will be undertaken under an appropriate licence?**
N/A
13. **Has a reviewer been contacted? It is the applicant’s responsibility to do this. The peer review form must be submitted with this application and any comments noted in the review must be actioned prior to submission.**
N/A
14. **Who will be recruited to participate in this study?**
Stakeholders affected by the conservation of sea otters in urban areas. These include the public, tourist operators, conservationist and fisheries
15. **Are there any potential participants who will be excluded? If so, what are the exclusion criteria?**
No
16. **How many participants will be recruited?**
We will interview 10 individuals from each stake holder group.
17. **How will the participants be recruited?**
We will contact relevant stakeholders through email or through personal connections with the sea otter savvy organization, and supply them with a participant information sheet, giving them a couple of days to reply if they would be interested in joining the study. Then a snowball method will be used to contact more relevant stakeholders from each group.
18. **How will informed consent be obtained from all participants or their parents/guardians prior to individuals entering the research study?**
They will be given a consent form with all the necessary information
19. **How long will potential participants have to decide whether to give consent?**
They will be given information during the first encounter or email, and then they will be given the consent form which they have as long as they want to read over
20. **Will participants be kept informed of new information that becomes available during the study which may influence their continued participation?**
No
21. **Will the study involve actively deceiving, or withholding information from, the participants?**
No
22. **Will participants be made aware that they can withdraw from the study at any time without having to give a reason for doing so?**
Yes
23. **Describe potential risks (physical, psychological, legal, social) arising from these procedures:**
Participants will be asked questions regarding age, income and gender which they can choose to divulge or not. There should not be any risk to the interviewer as all interviews will be conducted in

public areas, such as coffee houses, offices or at Moss Landing Marine Laboratories. However, a schedule of all interviews will be made available both to the supervisors in America and the UK so that they are made aware of the students location. Furthermore, an emergency plan has been organized and mobile numbers have been exchanged with all supervisors.

24. How will participants be informed about the outcome of the study?

They will be given a copy of the finished report where they can read about the results

25. How will the results of the study be disseminated and reported?

The results from the study will be published in an accredited scientific journal. The author can also share the results at various biological conferences if any should accept. This will be organized after the study has been conducted. Furthermore, a short summary of the results will be shared with the participants in order to inform them of the finding of the study. The result will help understand different stakeholders view on sea otter conservation. This can then be implemented in future management plans of sea otters in urban areas by considering different stakeholders points of interests while still trying to maintain an adequate level of conservation for the sea otters.

26. Is any payment other than reimbursement of expenses to be made to participants?

No

27. Will personal data, beyond that recorded on the consent form, be used in the research?

No

28. Will the participants be audio-recorded or video - recorded?

Yes – they will be audio-recorded

29. What arrangements have been put in place to ensure confidentiality and security of data gathered in the study?

There is a signed confidentiality agreement presented to the participants before the study. Furthermore, all recordings will be password protected on the researchers computer while the data is being analyzed. **The interviews will be stored for 10 years and after that time will be destroyed.**

30. Has this proposal been seen by another ethics committee?

No

31. Do any of the investigators have any actual or potential conflict of interest in this study?

No

32. How will the data be made available at the end of the project?

The interviews will not be made available as it will be destroyed soon after the project is finished. However, a summary of the findings will be presented to all stakeholders as well as the final report will be made available through accredited science journals.

Level of Access:

Choose an item.

33. Is there any other relevant information you would like to make known to the committee?

The study will be conducted with the Sea otter savvy organization which studies the human disturbance on sea otters. This association could be a conflict of interest; however the organization

will only receive an anonymized report and any and all results will only reflect the current status of stakeholders perception of sea otter conservation. The organization has no financial involvement with the project. The organization will only provide supervision from Gena Bentall and office space at Moss Landing Marine Labs.

34. Have you read and understood the guidelines for filling in this form and the Committee Statement ?

Yes

Submit by via [the online ethics tool](#).

Date:

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