Breaking Down "Harassment" to Characterize Trends in Human Interaction Cases in Maine's Pinnipeds

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BREAKING DOWN “HARASSMENT” TO CHARACTERIZE TRENDS IN HUMAN INTERACTION CASES IN MAINE’S PINNIPEDS

by

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ABSTRACT

For hundreds of years the state of Maine has been home to pinniped populations. While these populations experienced heavy pressure from humans, they became federally protected under the Marine Mammal Protection Act in 1972. The Act ultimately included language to create the Marine Mammal Health and Stranding Response Program. This program has allowed for stranding networks to form to respond to stranded animals and collect data from these animals. Long term datasets have been produced by these stranding networks, providing a valuable resource for studying patterns and trends in marine mammal health. I utilized these datasets for my analysis of stranding trends and human interaction (HI) occurrences using data collected from stranded harbor (Phoca vitulina), harp (Pagophilus groenlandicus) and gray (Halichoerus grypus) seals from 2007 to 2019 in Maine. As part of this analysis, I developed a new classification scheme for defining HI, which focuses on breaking down harassment based on the type of harassment and the risks that come with it. HI, and harassment in particular, presents a multitude of problems that affect pinnipeds on both an individual and population scale, while also presenting a risk to humans who interact with these mammals. This analysis will provide insight into where and which HI is occurring in Maine, helping us inform stranding networks on where to focus effort in mitigating human interaction, as well as how strandings and human interaction impact marine mammal health and larger trends relate to global patterns.
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INTRODUCTION

The United States (US), like most countries that border oceans worldwide, has a long history of exploiting its coastal ecosystems, including species that today are valued primarily for their non-consumptive use. Pinniped populations, for example, were decimated across the country in the 19th century first as a result of hunting for their meat, oils, and furs, and later when targeted by state and local-government financed bounties (Cammen et al. 2019). This exploitation continued in some locations until 1972, when the US Marine Mammal Protection Act (MMPA) was passed in response to growing concern over the conservation status of many marine mammal species. The passing of the MMPA, as well as other environmentally-focused legislative acts in the same decade, reflected a shift in cultural perspective to conservation and environmental protection.

The MMPA was written in an effort to keep marine mammal populations at or above their optimum sustainable population level. To do so, the Act prohibits any “take” with exceptions permitted by the National Marine Fisheries Service for several defined activities, including incidental takes by the fishing industry. “Takes” are defined under the MMPA as the harassment, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal (MMPA).

In 1992, the MMPA was amended to include Title IV which created the Marine Mammal Health and Stranding Response Program. This program was tasked with responding to marine mammals in distress, monitoring marine mammal population health, and investigating unusual mortality events. This work is carried out by organizations that are authorized as members of a national marine mammal stranding network to receive and respond to reports of stranded marine mammals. Stranded animals
include (i) dead animals found on a beach or in US waters, (ii) live animals found on a beach which are unable to return to the water without assistance or which require medical attention, and (iii) live animals on shore or in the water that are unable to return to their natural habitat without assistance (MMPA).

Marine mammal stranding response organizations typically respond to reports of stranded animals by going to the site of a reported marine mammal to gather data about the animal and in some cases, collect the animal for transfer to a triage or rehabilitation center. The data gathered on these animals, including species, sex, age class, and stranding location, are stored in a national database. When evident, these data also include information on human interaction (HI), categorized at the most basic level as: vessel interaction, shot, fishery interaction, and other human interaction. The final category encompasses harassment of marine mammals, which includes behaviors such as tormenting or annoying a mammal with the potential to cause a disruption to the animal or its behavior.

Collecting HI data is important in understanding how people are impacting the health of marine mammals. Human interaction can be responsible for injury, stress, abandonment, and death of marine mammals. The type of HI is often distinguished by injury and physical evidence. Vessel interactions can result in lacerations from propellers and evidence of blunt force trauma from boat collisions. Fisheries interactions are often characterized by the presence of fishing gear or open wounds that result from entanglement. Ingestion of fishing gear can be determined upon a necropsy. Evidence of harassment however is more challenging to identify and requires observation or reporting of harassment behaviors. Harassment can cause physical harm to animals. For example,
people have been observed throwing rocks at seals in order to get their attention (Constantine, 1999), and reports of people dragging seals into or out of the water are not uncommon. Even without physically interacting with the animals, approaching hauled out seals by boat or on land can flush animals into the water, with negative effects including stress and thermoregulatory challenges for the animal. The flushing of seals can also cause disruptions in mating if it occurs during the breeding season (Holcomb et al), as well as disruptions in lactation periods which can cause pups to become malnourished and underdeveloped. A regular disruption of the breeding season could have detrimental effects on the ability of a population to grow, as observed in the case of the Hawaiian Monk Seal at Kure Atoll, as described by Gerrodette & Gilmartin (1990). Beginning in the 1950s, humans and dogs regularly disturbed monk seals on beaches, causing a thirty-year decrease in population levels and an increase in pup mortality ending in 1980. This disturbance caused a shift in haul out sites associated with the Atoll, and subsequently forced the Hawaiian Monk Seals into less habitable areas where predation was more common and pups had a harder time surviving (Gerrodette & Gilmartin, 1990).

Human interaction can have unintended consequences that harm humans as well. For example, sea lions have been observed charging at humans that approach them too closely (Constantine, 1999). Humans that handle marine mammals are at a risk for getting bitten by the animals and can develop infections from zoonotic pathogens (Bogomolni et al, 2008). Generally, HI can have negative effects on both seals and humans in different ways.

The role of marine mammal harassment in particular is of growing concern in Maine, where there exists significant spatial overlap between human activity and
pinnipeds, in particular harbor (*Phoca vitulina*), harp (*Pagophilus groenlandicus*) and gray (*Halichoerus grypus*) seals. Reports of HI cases have increased particularly in the southern part of Maine from 2007 to 2019, with the majority of these cases being attributed to harassment. Since the term “harassment” is broad and encompasses several human behaviors, there is currently uncertainty about the frequency of different types of human behaviors as well as the impact of these HI cases on pinniped population health in the region. For example, approaching a seal would be considered harassment and it would likely cause the animal some stress. However, picking up that animal would likely compound the stress that animal is feeling and could lead to the injury of that seal, but still only be defined as harassment. The lack of detail in how these cases of harassment are categorized in the current HI classification scheme also make it difficult for stranding networks to track the types of HI that are occurring in their region, thus making it more difficult for them to mitigate these types of interactions.

To address gaps in our current understanding of these HI cases, I have conducted an analysis of historical stranding records, with continuous support and input from Maine’s stranding networks. As part of this analysis, I developed a new classification scheme for defining HI, which focuses on breaking down harassment based on the type of harassment and the risks that come with it. With this new scheme, I describe when and where HI with seals occurs in Maine, and what species of seals are most often affected. These data will better inform stranding networks about where to concentrate their efforts on mitigating HI, as well as what types of HI are most common in those areas. By performing this analysis, we will gain a better understanding of what types of HI are
occurring and how they impact marine mammal health and how these strandings relate to global patterns.
METHODS

Stranding records from Marine Mammals of Maine, which handles response along the coast from Kittery to Rockland, and Allied Whale, which responds from Rockland to the Canadian border, were collected and entered in a custom database as part of a greater analysis of stranding trends in Maine’s pinnipeds. The database includes both reports of marine mammal strandings and sightings (animals that were reported by the public to a stranding hotline but were not confirmed as stranded or in need of assistance). For my analysis, I used data collected from stranded harbor (Phoca vitulina), harp (Pagophilus groenlandicus) and gray (Halichoerus grypus) seals from 2007 to 2019 in Maine. Of these, only stranded animals that had also been recorded in the US Marine Mammal Health and Stranding Response Program’s National Stranding Database were included. From these stranded animals, I further excluded any unconfirmed reports or reports of animals decomposed to the point of mummification.

For my analysis, I extracted species, sex, age, location of stranding, evidence of HI, and the reporter or responder’s comments from all pinniped stranding reports from January 1, 2007 through December 31, 2019 from this National Database. With every stranding the response networks fill out a Level A form. This form created by NOAA is what is entered into the national database, allowing for the standardization of data. This form categorizes HI into four categories: vessel interaction, shot, fishery interaction, and other HI. With most HI cases a second form is also completed, the NOAA HI form. This form includes the HI categories: entanglement, vessel trauma, hooking, gunshot, mutilation, ingestion, harassment, and could not be determined (CBD)/other. I supplemented these HI notes from the National Database with the HI data from our
custom database which included more information taken by the reporter and responders directly involved in each case.

To develop my modified HI categorization scheme, we considered all types listed on the NOAA HI Form, as well as more specific, common types of harassment observed in Maine. Beginning with a previously developed scheme from Marine Mammals of Maine, we narrowed down and combined types of harassment by looking at their impact to the seal. For example, taking pictures was incorporated into approach as the taking pictures itself if not the harassment, but the approach was. Similarly, all types of forced return to water were combined into one category as they all have the same result of the seal in the water. If the action included physical contact, this would be described by also selecting physical contact when describing the interaction. The goal of the scheme was to separate distinct types of harassment based on the impact on marine mammal health, rather than type of human behavior.

We used the NOAA HI Form to provide a basis for our scheme, including all HI types listed on the form. We included unspecified harassment to describe cases we saw in the data with only “harassment” used to describe the interaction. Canine interaction was also included as dogs are typically on beaches with humans but are not restricted from approach by the MMPA.

My new categorization scheme includes clear definitions of each type of HI primarily provided by NOAA, as well as its associated relevant risks to the seal. The scheme was informed by my review of reporter and responder comments that indicated evidence of HI, and considered the potential implications of the HI type for animal well-being to group or split category types, following a similar approach taken by Samuels and
Bejder (2004) for categorizing HI cases with bottlenose dolphins. The categorization scheme was pilot tested on subsets of the data records and revised in an iterative process with feedback from marine mammal scientists and stranding network members. Feedback was gathered through one-on-one communication, at small research team meetings, and at regional scientific conferences.

Using my new scheme, I re-assigned a HI type to all stranding records initially categorized as “harassment.” Records were re-classified using information included in the reporter and responder comments appended to each stranding report. I then analyzed spatial and temporal trends in HI cases in Maine during the study period using descriptive statistics to compare the number of HI cases by species, age class, year, and location.
RESULTS

Total Strandings

Following the data filtering steps described above, there were a total of 3533 confirmed strandings reported to Marine Mammals of Maine and Allied Whale from 2007 to 2019. Marine Mammals of Maine and Allied Whale saw their highest number of reports in 2018 and their lowest number of reports in 2010 and 2009, respectively (Figure 1). Of the coastal counties, York County had the highest number of stranding reports (1,490) and Waldo had the lowest number of reports (50) from 2007 to 2019 (Figure 2).

Harbor seals were the most frequently reported stranded pinniped, representing over 70% of the total strandings each year (Table 1). Overall, there were 3078 total harbor seal strandings reported, 268 harp seal strandings, and 187 gray seal strandings (Figure 3). Of the 3078 reports of stranded harbor seals, 31% were reported in 2018 during a disease-associated unusual mortality event.

Human Interaction

Of the reported strandings, 522 involved confirmed HI. A greater number of HI cases were reported to Marine Mammals of Maine than Allied Whale every year since 2011 (Figure 1), but overall a lower proportion of stranded cases involving HI were reported to Marine Mammals of Maine (14.6%) than Allied Whale (15.4%) over the entire study period. Both Marine Mammals of Maine and Allied Whale had the highest numbers of cases with HI in 2019 (Figure 1). York County had the highest number of HI reports of the Maine counties; however, York County had the third highest proportion of HI to total reports (28%). The county with the highest proportion of HI cases was Kennebec (66%), followed by Washington (56%) (Figure 4).
Harbor seals were the most interacted with each year, and in total. Harp seals were more interacted with than gray seals over the total time period, however, neither species was interacted with more than the other every year. All three seal species experienced increasing rates of human interaction from 2007 to 2019 (Figure 3). Pups were most frequently interacted with, followed by yearlings and then adults (Figure 7).

**Classification of Human Interaction**

To describe these HI cases, my new categorization scheme included the existing categories of entanglement, vessel trauma, hooking, gunshot, mutilation, and ingestion from the NOAA HI form and replaced harassment with human approach. I also added a new category of canine interaction based on the number of interactions reported between canines and seals. The human approach category was further subdivided based on the type of harassment and risk it posed to the seal. In total, I defined six human approach subcategories: physical contact, relocation out of water, relocation into water, unauthorized collection, covered, and feeding. These subcategories were included because they required approach before the harassment can be carried out. It is important to understand that in this analysis going forward, human approach is selected when selecting any of the subgroups. This ensures that all HI types are described within the data for each HI report. This scheme was presented to Marine Mammals of Maine and Allied Whale and feedback was provided to make the scheme clear, concise, and applicable (Table 2).

The most frequently observed type of HI was “other human interaction” as categorized on the Level A form data and “harassment” on the NOAA HI form (Figure 5). Accordingly, when “other human interaction” was reclassified under my scheme, the
most frequent HI type was human approach. Human approach was reported in 341 cases. Within human approach, physical contact was the most common type of HI (Table 2).

Using my scheme, the most common types of HI were human approach, entanglement, vessel trauma, canine interaction, and gunshot. Human approach, entanglement, vessel trauma, and canine interaction were most frequent in York County, whereas gunshot was most common in Washington County (Figure 8).

From 2007 to 2019, harbor seals were the species most often approached, entangled, and involved in vessel trauma. Gray seals were the species most often shot (Figure 6). Pups were most often approached and involved in vessel trauma. Adults were most often entangled and shot (Figure 7).
DISCUSSION

Human interaction with marine mammals has known risks of negative impacts for both the marine mammals and humans involved. Yet, in Maine, reports of HI cases have continued to increase in recent years, primarily attributed to harassment. To address current gaps in our understanding of the potential impact of harassment on pinniped populations, I undertook a retrospective analysis of stranding records from Maine from 2007 to 2019. As a part of this analysis, I described an updated classification scheme for defining HI, focusing on harassment and providing data on when and where HI occurred.

My analysis revealed temporal and geographic trends in the number of strandings and HI cases across the state of Maine that can be in large part attributed to human population density and coastline access, which affect observation effort and reporting of stranding marine mammals. Throughout the study period strandings of harbor, gray, and harbor seals generally increased over time. These trends could be due to the warming of the Gulf of Maine causing a shift in prey distribution (Nye et al., 2009), a change in local climate in recent years reducing critical habitat features such as sea ice (Soulen et al., 2013), or a shift in predator distribution as white sharks continue to rebound in the North Atlantic (Bastien et al., 2020).

Southern Maine saw a larger increase in strandings than Eastern Maine. The number of HI cases have also increased in both regions since 2007, as well as the frequency of HI cases. This increase, in part, triggered a need to understand the types of HI occurring, thus allowing stranding networks to better prevent these interactions. Throughout the study period there were higher numbers of reports of HI in Southern Maine, however Eastern Maine had a higher proportion of HI cases until 2014. Each year
after 2013, however, HI reports of human approach were higher in Southern Maine than Eastern Maine, possibly corresponding to the higher population density located in this region compared to that of Eastern Maine. Higher human population density has also been associated elsewhere with areas of higher stranding density and higher HI cases, often attributed to both increased reporting effort and likelihood of interaction with humans in these areas (Goldstein et al., 1999). This has been previously identified as a factor influencing pinniped strandings through reporting effort (Olsen et al., 2020).

The increase in strandings and HI cases with time is a pattern also being observed on the West Coast of the United States (Warlick et al., 2018). Warlick et al. (2018) note that these trends are not a constant increase, but rather occur in spikes, similar to what is being observed in Maine. These strandings on the West Coast could be a result of weather events such as El Nino (Keledjian & Mesnick, 2013), an increase in fishing efforts, and outbreaks of disease as was seen in Maine in 2018. While this analysis does not factor in live versus dead strandings, a logical next step would be to compare human interaction occurrences to frequency of live or dead strandings in each region. Filling this gap of live or dead strandings could help develop an understanding of HI frequency during disease outbreaks such as the unusual mortality event that occurred in Maine in 2018. It is important to have an understanding of what may cause increases in strandings to understand how stranding networks can better prepare for increases in report volume and scientists can better understand the relationship between pinnipeds and their habitats.

The development of my classification scheme was strongly informed by considering the varied risks of HI to pinnipeds rather than the types of human behavior occurring. The scheme incorporates the HI types listed on the NOAA Human Interaction
form while further developing the Level A “Other Human Interaction” category that currently comprises the majority of cases in Maine. These “Other Human Interaction” cases did not truly describe the types if HI.

Harbor seals are the most commonly sighted species of seals in Maine (Katona et al. 1993). Accordingly, they are also the species that is most frequently reported to stranding networks, and the species with the highest number of HI cases. Harbor seals pup during the early summer months in Maine, during a time when human beach visitation rates are high. This results in more mothers and pups resting on beaches which humans are also occupying. Oftentimes humans assume that a pup has been abandoned if it has been left alone on a beach, even if the mother is just out foraging. Humans then will approach the pup to see if it needs help, or because they do not know how detrimental it can be to a pup's health. At this point, the pups are at a susceptible life stage and can be easily stressed. Unfortunately, long term patterns of approach can disrupt mother-pup bonding and ultimately can lead to abandonment (Wilson, 2005).

When approach occurs, other types of harassment can as well. The most frequent type of HI following human approach is physical contact (Table 2). Physical contact can include petting, pickup up, or touching a seal in any way. This contact puts the animal at increased risk of stress, abandonment, injury, and disease transmission.

Consistent HI can lead to habituation of marine mammals. In New Zealand, there are reports of sea lion behavior remaining unchanged as they are closely approached (Constantine 1999). Similarly, Holcomb et al. (2009) described observing little measurable short-term behavioral changes in California sea lions in response to human approach. Should pinnipeds become habituated to humans and human approach, there
could be an increased risk in zoonotic disease transmission. Furthermore, if humans begin to approach pinnipeds closely, they could be at risk of injury from aggressive behaviors such as charging described by Constantine (1999).

Gunshots made up approximately 1% of human interaction occurrences in Maine throughout the study period. However, these gunshots can be extremely harmful and lethal to pinnipeds. Gunshot wounds have been observed on the West Coast of the United States to have caused central nervous system damage, paralysis, and dermal abrasions in pinnipeds. There is also anecdotal evidence that these gunshots have been intentional, although banned as a result of the Marine Mammal Protection Act (Goldstein et al, 1999). While shooting a marine mammal is illegal in Maine as a result of the MMPA as well, it clearly still occurs and is oftentimes deadly for an animal. It is important to understand when and where this is happening in Maine to prevent it from becoming an issue large enough to impact populations.

When analyzing the most frequent types of HI by county, clear patterns emerge. Human approach is most common in Southern Maine counties York and Cumberland where beaches are likely more heavily trafficked. Similarly, these beaches see the highest number of reports of canine interactions, as people may be taking their dogs to the beaches. Vessel trauma and fishery interactions were most common in York county, and gunshots were most common in Washington county (Figure 8).

By developing a stronger understanding of HI trends, stranding networks can best distribute effort along the coast of Maine to help negate the amount of HI being observed. Furthermore, in using a HI categorization scheme that is consistent throughout the state and is agreed upon by stranding networks, data can better be analyzed and compared to
determine trends. Unfortunately, this scheme is not applicable to all regions outside of Maine. This scheme is specific to what has been observed with Maine’s pinnipeds, but would not apply to the types of human interaction observed to a region where there are no pinnipeds or in remote areas where marine mammals are hard to access and harassment is less common. However, the process of developing this scheme could be transferred to other areas where strandings and human interaction are well documented, specifically, the process of breaking down human interaction types based on marine mammal health rather than human behavior.

This process could be used to further develop our understanding of how humans and marine mammals interact, as well as how human behavior impacts marine mammal health. With this understanding, trends in the impacts of humans on marine mammal health can be compared in regions across the globe. Similarly, trends in global HI can be compared to assess what types of HI are common globally and how humans are impacting marine mammals on both an individual and population level.
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APPENDICES
APPENDIX A: FIGURES AND TABLES

Figure 1: Number of strandings of harbor, harp, and gray seals reported to Marine Mammals of Maine and Allied Whale from 2007 to 2019. Darker blue bars on the bottom represent confirmed human interaction cases and lighter blue bars on the top represent cases in which human interaction was not confirmed or could not be determined.
Figure 2: Number of strandings of harbor, harp, and gray seals reported in each county from 2007 to 2019. In addition, there was one floating not attributed to a county.
Figure 3: Number of human interaction cases per year for harbor, harp, and gray seals reported in Maine from 2007 to 2019
Figure 4: Number of cases and frequency of human interaction (HI) reported in association with stranded harbor, gray, and harp seals in each county in Maine from 2007 to 2019.
Figure 5: Frequency of types of human interaction (HI) pinniped cases, categorized using the NOAA Level A classification scheme, reported in Maine from 2007 to 2019.
Figure 6: Number of human interaction reports per species in Maine from 2007 to 2019 based on the modified classification scheme.
Figure 7: (Spans page 25-26) Number of human interaction reports by age class and human interaction type from 2007 to 2019 based on the new classification scheme.
Figure 8: Number of occurrences of the most common five types of human interaction reported in association with stranded harbor, gray, and harp seals in each county in Maine from 2007 to 2019.
Table 1: Frequency of total stranded harbor, gray, and harp seals in Maine from 2007 to 2019.

|     | Pv  | Pg  | Hg  |
|-----|-----|-----|-----|
| 2007| 86% | 7%  | 7%  |
| 2008| 84% | 12% | 4%  |
| 2009| 83% | 14% | 3%  |
| 2010| 71% | 23% | 6%  |
| 2011| 87% | 10% | 3%  |
| 2012| 96% | 0%  | 4%  |
| 2013| 89% | 3%  | 8%  |
| 2014| 88% | 8%  | 4%  |
| 2015| 85% | 9%  | 6%  |
| 2016| 85% | 10% | 5%  |
| 2017| 84% | 8%  | 8%  |
| 2018| 94% | 1%  | 4%  |
| 2019| 77% | 15% | 8%  |
Table 2: Number of occurrences of each type of human interaction under the new classification scheme reported in association with stranded harbor, gray, and harp seals in each county in Maine from 2007 to 2019.

| HI Type                  | Number of Occurances |
|-------------------------|-----------------------|
| Vessel Trauma           | 49                    |
| Entanglement            | 57                    |
| Hooking                 | 3                     |
| Gunshot                 | 7                     |
| Ingestion               | 0                     |
| Mutilation              | 1                     |
| Canine Interaction      | 31                    |
| Unspecified Harassment  | 32                    |
| Other                   | 9                     |
| Unknown                 | 10                    |
| Human Approach          | 341                   |
| Physical contact        | 167                   |
| Relocation out of water | 28                    |
| Relocation into water   | 93                    |
| unauthorized collection | 70                    |
| Covered                 | 45                    |
| Feeding                 | 20                    |
Table 3: New classification scheme of human interaction (HI), including definition of each type of HI and possible risk associated with the interaction.

| HI type                                      | HI definition                                                                                                                                 | Possible risk to seal     |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Vessel Trauma (sharp, blunt, both)           | Blunt force trauma or lacerations caused by being hit by a boat or a propeller                                                              | • Injury  
• Death             |
| Entanglement (gear, debris, CBD)             | When fishing gear, rope, or debris get caught around an animal                                                                             | • Injury  
• Trapping  
• Death             |
| Hooking (recreational, commercial, CBD)      | Occurs when a fishing hook (or lure) is imbedded on the body or in the mouth of an animal. If the hook or lure is in the throat or GI tract, it should be considered ingested gear. | • Injury  
• Trapping  
• Death             |
| Gunshot                                      | Gunshot wound                                                                                                                                  | • Injury  
• Death             |
| Ingestion (gear, debris, CBD)                | Occurs when an animal ingests a foreign object, i.e., the object travels past the mouth and into the throat (or further down the GI tract) | • Injury  
• Death             |
| Mutilation                                   | Occurs when an animal or carcass is intentionally harmed, especially when cut or sliced, generally involves the use of some type of knife or blade and can result in wounds and amputations including body sliced, stabbed, or gutted or appendages removed. Spray paint of a carcass is also mutilation. | • Injury  
• Death             |
| Human approach                               | Observed approach of one or more people within 50 yards of the animal on land or in water                                                   | • Stress  
• Abandonment of pups |
| Physical contact                             | Physical contact with the animal, may include picking up and petting                                                                       | • Stress  
• Injuries  
• Disease transmission  
• Abandonment of pups |
| Relocated out of water                       | Physically removing animal from water or chasing it out of water                                                                           | • Stress  
• Injuries  
• Disease transmission  
• Abandonment of pups |
| Relocated into water                         | Physically returning the animal to the water or chasing it back into the water                                                             | • Stress  
• Injuries  
• Disease transmission  
• Abandonment of pups |
| Unauthorized collection                      | Relocating animal onto or off the beach, transported, bringing home, etc                                                                   | • Stress  
• Thermoregulatory challenge |
| Covered                                      | Pouring water on the animal or covering it with a towel, a blanket, seaweed or other                                                         | • Stress  
• Thermoregulatory challenge |
| Feeding                                      | Humans trying to feed animal                                                                                                               | • Stress  
• Digestive issues for the seal |
| Canine interaction                           | Approach or hit by dog                                                                                                                     | • Stress  
• Injury  
• Disease transmission |
| Unspecified harassment                       | i.e. Throwing rocks at, collecting dead animal                                                                                              |                           |
| Other                                        | i.e. Throwing rocks at, collecting dead animal                                                                                              |                           |
APPENDIX B: ALLIED WHALE CALL REPORT SHEET

Marine Mammal and Turtle Stranding Phone Call Report
(Form Date: August, 2019)

Date: __________________________ Time: ____________
Your Name: ________________________

Voice mail or Text Message: ____________________________

Name of Caller: __________________________
Location of caller (where does the caller live): __________________________
Caller’s Phone #: __________________________
Primary Contact Person’s Name and Phone #: __________________________
(person who originally reported the stranding)

Animal’s Location:
Town/Village: __________________________
Latitude: ____________° N Longitude: ____________° W
Estimated: ____________ Actual: ____________

wing, MAP / CHART / GPS / INTERNET (Google, phone)

Species Identification (if species not verified, put “unk.”) and Animal Description

| Whale | Cetacean | Turtle | Other |
|-------|---------|--------|-------|
| ____________ | ____________ | ____________ | ____________ |

Age Class: ____________________________ Age Class: ____________________________

Alive: _____ Dead: _____

Length: ____________ Weight: ____________

Sex: ____________ Color: ____________________________

Any Tags? Y / N Location on animal: ____________________________

Tag number/color: ____________________________

Animal Condition/Behavior

When was it first noticed: ____________________________

Noticable injured? Y / N Describe: ____________________________

If Alive:

Bright, Alert, Responsive (BAR): _____ Quiet but alert: _____

Moving head/tippers/body: _____ Lethargic: _____

Sleeping: _____ Vocal: _____

Emaciated: _____

Body condition: 1 (thin) – 5 (good): _____

If dead, what decomposition code? 1-5: __________________________

Noticeable discharge? From: FETS / MOUTH / NOSE Describe: ____________________________

Digital photos taken?: Y / N Taken by whom: ____________________________

ADDITIONAL COMMENTS: ____________________________


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APPENDIX C: MARINE MAMMALS OF MAINE CALL REPORT SHEET

| Call taken by: | Marine Mammals of Maine Animal Call Log |
|---------------|----------------------------------------|
| Date:         | Time:                                   |
| Caller Information | Name: NER                             |
| Contact #:    | Secondary #:                           |
| Condition:    | Live Dead CBD Code: 1 2 3 4 5 6 (CBD)  |
|               | Photos taken: Y / N                    |

### Stranding Location
- Animal: 
- Location: 
- Body of Water: Atlantic Ocean
- Town: 
- County: 
- Lat: 
- Long: 
- Estimate/Accurate Directions to Animal: Landmarks/Access/Direction:

### Live Animal Info
- Genus/species: Pup/Weanling/YOY/Calf/Juvenile/Sub-Adult/Adult/Unknown
- Length: ___ cm /in Estimate/Accurate
- Weight: ___ lb/kg Estimate/Accurate
- Male/Female/CBD
- Wgt: ___ lb/kg Estimate or Accurate
- Body Condition: Robust/Slightly Thin/Thin/Emaciated/CBD
- Animal Condition:

### Dead Animal Info
- Genus/species: Pup/Weanling/YOY/Calf/Juvenile/Sub-Adult/Adult/Unknown
- Length: ___ cm /in Estimate/Accurate
- Weight: ___ lb/kg Estimate/Accurate
- Male/Female/CBD
- Carcass description:

### Carcass Marking

### Injuries:

### Hi: Y/N/CBD Type:
- Action: Level A / Collected whole for Necropsy
- Disposal: Left at Site / Removal by Town / Buried / Collected by MME for Disposal / Other

### Relocation/Animal

### Marking:

### Injuries:

### Hi: Y/N/CBD Type:

### Initial action: Monitor / Volunteer response / Staff response / Referred to:

### Volunteer/Staff responder(s):

### Volunteer time/hours:

### Response

### Findings and outcome:
APPENDIX D: NOAA LEVEL A FORM

| Field | NMFS Regional # | NMFS Site # | National Database |
|-------|----------------|-------------|-------------------|
| Name  | Genus          | Species     |                   |

Examining Name: ____________________________  Affiliation: ____________________________
Address: ____________________________  Phone: ____________________________
Stating Agreement or Authority: ____________________________

Confidence Code (Check One): [ ] Unconfirmed - Low  [ ] Confirmed - Minimum  [ ] Confirmed - Medium  [ ] Confirmed - High

**INITIAL OBSERVATION**  Some Information for Level A Examination

**DATE:**
- Year: __________  Month: __________  Day: __________
- First Observed: [ ] Beach/Landing  [ ] Towed  [ ] Swimming

**LOCATION:**
- State: ____________________________  County: ____________________________  City: ____________________________
- Body of Water: ____________________________  Latitude: __________
- Depth: __________  Water Temperature: __________
- Long (DD): __________  Water Depth: __________
- Actual: __________  Estimated: __________

How Determined (check one):
- [ ] GPS  [ ] Map  [ ] Internet/Software  [ ] Other

**CONDITION AT INITIAL OBSERVATION** (Check One):
- [ ] Alive  [ ] Fledging  [ ] Advanced Decomposition
- [ ] Fresh Dead  [ ] Modified Skeletal  [ ] Moderate Decomposition
- [ ] Condition Unknown  [ ] Other:

**LIVE ANIMAL INFORMATION**

**INITIAL LIVE ANIMAL DISPOSITION** (Check one or more):
- [ ] Left at Site  [ ] Immediate Release at Site  [ ] 30-Day Hold  [ ] 7-Day Hold
- [ ] Released and Reassessed  [ ] Documented  [ ] Transferred to Rehabilitation
- [ ] Partially Released  [ ] Fully Released  [ ] Unknown/Other

**DEAD ANIMAL INFORMATION**

**CARCASS STATUS** (Check one or more):
- [ ] Frozen for Later Examination/Inoculation
- [ ] Sick  [ ] Injured  [ ] Abandoned/Ophanned  [ ] Inaccessible
- [ ] Other:

**NECROPSY**
- Yes  No
- Limited  Complete

**NECROPSY BY:**
- Date: __________  Month: __________  Year: __________

**PHOTOS/VIDEOS TAKEN:**
- Yes  No

**MORPHOLOGICAL INFORMATION**

**SEX** (Check One):
- [ ] Male  [ ] Female

**ESTIMATED AGE CLASS** (Check One):
- [ ] Adult  [ ] Young

**SAMPLES COLLECTED** (Check one or more):
- [ ] Skeletal  [ ] Soft Tissue  [ ] Other

**PARTS TRACKING** (Check one or more):
- [ ] Scientific Collection  [ ] Educational Collection

**OCCURRENCE DETAILS**

**GROUP EVENT**
- [ ] Yes  No

**Was the Marine Mammal Human Interaction Report completed?**
- [ ] Yes  No

**Findings of Human Interaction**
- [ ] Yes  No

**IF YES, WHAT WAS THE LIKELIHOOD THAT THE HUMAN INTERACTION CONTRIBUTED TO THE STRANDING?**
- [ ] Uncertain (CD)  [ ] Improbable  [ ] Probable

**Gelatinous Items Collected?**
- [ ] Yes  No

**HOW DETERMINED (CHECK ONE):**
- [ ] External Exam  [ ] Necropsy  [ ] Other:

NOAA Form 69-684; OMB Control No. 0649-0178; Expiration Date 03/31/2020
### TAG DATA

| ID | Color | Type | Placement* | Applied | Present | Removed |
|----|-------|------|------------|---------|---------|---------|
|    |       |      | Code (CRS) |         |         |         |

* Present (Y) / Present (N) / Left (L) / Right (R) / Left Front (LF) / Right Front (RF) / Left Rear (LR) / Right Rear (RR) / Body (B)

### ADDITIONAL IDENTIFIER:

(If animal is restrained, please indicate any previous field numbers here)

### ADDITIONAL REMARKS:

DISCLAIMER

These data should not be used out of context or without verification. This should be strictly enforced when reporting signs of human interaction data.

DATA ACCESS FOR LEVEL A DATA

Upon written request, certain fields of the level A data sheet will be released to the requestor provided that the requestor credit the stranding network and the national marine fisheries service. The national marine fisheries service will notify the contributing stranding network members that these data have been requested and the intent of use. All other data will be released to the requestor provided that the requestor obtain permission from the contributing stranding network and the national marine fisheries service.

PAPERWORK REDUCTION ACT INFORMATION

Public reporting burden for the collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection information, including suggestions for reducing the burden to: Chief, Information and Privacy Branch, Office of Management and Budget, Washington, DC 20503. NOT WITHSTANDING ANY OTHER PROVISION OF THE LAW, NO PERSON IS REQUIRED TO RESPOND, NOR SHALL ANY PERSON BE SUBJECTED TO A PENALTY FOR FAILURE TO COMPLY WITH A COLLECTION OF INFORMATION SUBJECT TO THE REQUIREMENTS OF THE PAPERWORK REDUCTION ACT, UNLESS THE COLLECTION OF INFORMATION DISPLAYS A CURRENTLY VALID OFFICE OF MANAGEMENT AND BUDGET (OMB) CONTROL NUMBER.
## Marine Mammal Human Interaction Report

### Exam Information (fill in or circle most appropriate)

- **Species:**
- **Recorder:**
- **Condition Code (at exam):**
  - 1: 
  - 2: 
  - 3: CBD
- **Body Condition:**
  - emaciated
  - not emaciated
  - CBD
- **Image Disposition:**
- **Integument:**
  - normal
  - abnormal
  - decomposed
  - % Skin missing:
    - 10%
    - 25%
    - 50%

### Explanation of terms:
- **YES** = I have examined the area and/or found signs of this pathology, natural marking, or human interaction
- **NO** = I have examined the area and/or did not find signs of this pathology, natural marking, or human interaction
- **CBD** = I have examined the area and could not determine whether there were signs of human interaction (i.e., the part was missing, degraded, or signs were ambiguous)
- **NE** = I did not examine the area
- **NA** = this animal doesn’t normally have that part (i.e., seals have no dorsal, dolphins have no rear flippers)

### Whole Body Exam

| Field | YES | NO | CBD | NE | NA | Image taken |
|-------|-----|----|-----|----|----|-------------|
| Externality/pathology |     |    |     |    |    |             |
| Natural markings |     |    |     |    |    |             |
| Appendage(s) removed/Mutilation (with instrument) |     |    |     |    |    |             |
| Pelt removed/Mutilation (with instrument) |     |    |     |    |    |             |
| Body sliced/Mutilation (with instrument) |     |    |     |    |    |             |
| Gear/Debris present on animal (including tags) |     |    |     |    |    |             |
| Gear/Debris retained (name & contact info in Comments) |     |    |     |    |    |             |
| HI lesions (fetuses, gunshot, propeller, healed HI scar, brand) |     |    |     |    |    |             |
| Predation/scavenger damage |     |    |     |    |    |             |

### Fill in table for all possible findings of HI

### Detailed Exam of anatomical areas

| Detailed Exam of Anatomical Areas | YES | NO | CBD | NE | NA |
|-----------------------------------|-----|----|-----|----|----|
| Rostrum/nout                      |     |    |     |    |    |
| Mandible                         |     |    |     |    |    |
| Head and/or neck                 |     |    |     |    |    |
| L. Front appendage                |     |    |     |    |    |
| R. Front appendage                |     |    |     |    |    |
| L. Body                           |     |    |     |    |    |
| R. Body                           |     |    |     |    |    |
| Dorsum/dorsal fin                 |     |    |     |    |    |
| Ventrum                           |     |    |     |    |    |
| Peduncle                          |     |    |     |    |    |
| L. Rear appendage                 |     |    |     |    |    |
| R. Rear appendage                 |     |    |     |    |    |
| Flukes/tail                       |     |    |     |    |    |

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### INTERNAL EXAM

| Date | YES | NO | PARTIALLY | CBD | IMP | DETAILED INFO |
|------|-----|----|-----------|-----|-----|---------------|
| 30   |     |    |           |     |     | Details in Comments section-use line number |
| 31   |     |    |           |     |     | Details in Comments section-use line number |
| 32   |     |    |           |     |     | Details in Comments section-use line number |
| 33   |     |    |           |     |     | Details in Comments section-use line number |
| 34   |     |    |           |     |     | Details in Comments section-use line number |
| 35   |     |    |           |     |     | Details in Comments section-use line number |
| 36   |     |    |           |     |     | Details in Comments section-use line number |
| 37   |     |    |           |     |     | Details in Comments section-use line number |
| 38   |     |    |           |     |     | Details in Comments section-use line number |

**Comments** (note line number from left margin before each comment):

| FINDINGS OF HUMAN INTERACTION:  | YES | NO | CBD |
|---------------------------------|-----|----|-----|
| (Transfer to Level A Datasheet) |     |    |     |

| STRANDING EVENT HISTORY/CIRCUMSTANCES: |
|----------------------------------------|

| INITIAL HUMAN INTERACTION EVALUATION: |
|---------------------------------------|
| If marked YES above (line 40) evaluate the external exam, necropsy, carcass condition and circumstances surrounding the stranding event to answer the question below. Remember to be conservative in your subjective evaluation. What is the likelihood that the finding of human interaction (line 40), contributed to the stranding event? |

| 0: Uncertain (CBD) | 1: Improbable | 2: Suspect | 3: Probable |
|-------------------|---------------|------------|-------------|

**Justification:**

Final human interaction evaluation requires additional data from level B and C analyses as well as review by experts (e.g., a veterinary pathologist).
AUTHOR’S BIOGRAPHY

Emma Newcomb grew up in Chelmsford Massachusetts where she graduated from Chelmsford High School in 2017. She started attending the University of Maine that fall. Majoring in marine sciences, Emma has concentrations in biology and oceanography. Since fall of her freshman year, Emma has worked with Dr. Kristina Cammen performing data entry and analysis on marine mammal strandings. Emma began spearheading a research project analyzing the classification of human interaction with seals. This research continued through funding from the UMaine’s Prescott Grant proposal on the Retrospective Analysis of Marine Mammal Strandings in a Region of Socio-Ecological and Environmental Change. While working under this grant, she was awarded a Center for Undergraduate Research Fellowship.

She has worked as a resident assistant in the Honors housing complex for three years, where she is currently lead resident assistant. During her time at UMaine, Emma has also worked as a tutor and an undergraduate teaching assistant in the School of Marine Sciences, as well as a Maine Learning Assistant through the UMaine Rise Center.

Upon graduation, Emma plans to pursue jobs in marine mammal health and behavior before continuing her education and receiving an advanced degree in marine science.