Anthrozoology, Anthropomorphism, and Marine Conservation: A Case Study of Southern Resident Killer Whale, Tahlequah, and Her Tour of Grief

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Abstract

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The field of marine affairs is broad, and covers everything from marine pollution policy and management to the blue-green economy and conservation science. The newest area of marine research is anthrozoology – the study of the relationships between human and nonhuman animals. Anthrozoology includes social sciences and humanities along with natural sciences, and can have powerful effects on human behavior - making it important in conservation and fishery economics, and for understanding human nature. One of the reasons the study of anthrozoology is important is because it encompasses anthropomorphism of animals as a research theme. Anthropomorphism is the application of human thoughts and behaviors to objects and animals, and creates empathy because humans then view animals as similar to themselves. This empathy is key in promoting conservation action for endangered species. The case study for this thesis

looked for anthropomorphism in the news frenzy surrounding the death of Southern Resident Killer Whale (SRKW) Tahlequah (J-35)'s calf. As Tahlequah mourned her calf, news articles describing her grief, NPR stories, and magazine features became a daily onslaught for Seattle locals and beyond. The case study found that people identified with Tahlequah as a mother losing her child, an anthropomorphic construct that possibly changed the way people view killer whales, and influenced their conservation. The outpouring of support from the public for the recovery of SRKW after hearing about the story is likely because of anthropomorphism, and it represents the possibilities for other threatened and endangered marine life.

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Introduction

The field of marine affairs is broad, and covers topics such as marine pollution policy and management; the blue-green economy; environmental law and policy; climate change and ocean acidification; marine tourism; maritime commerce; technology and security; environmental protection and restoration; sustainability science; and finally, natural resource management. All of these areas of research involve human and animal interactions, and many are well-studied and have overlapping goals. Maintaining healthy species populations both for human use and for an ecosystem's sake is often the main priority of marine affairs. Understanding community use of living resources and improving economics surrounding them is also a focus. This living resource management can be broken into main categories of biology, conservation, and commercial fisheries.

What's missing from this list is anthrozoology – the study of the relationships between human and nonhuman animals. Anthrozoology is a relatively new field, and includes social sciences and humanities along with natural sciences, so it is a bit unconventional and has been slow to catch on in the hard sciences world. However, anthrozoology can have powerful effects on human behavior, and is thus has important implications for conservation and fishery economics, as well as understanding human nature.

One of the reasons the study of anthrozoology is important is because it encompasses anthropomorphism of animals as one of its research themes. Anthropomorphism is the application of human thoughts and behaviors to objects, and is mostly directed at animals. It is a part of daily life in Western societies, even though many people may not be aware they are doing it. Think of domesticated pets – people dress their dogs in outfits and treat them as they would their own children, analyzing and responding to their thoughts and 'feelings' even though they do not share a language and cannot truly know what their dog is thinking. Humans do not just anthropomorphize their pets, however; this tendency encompasses wild animals as well. While this extension to non-domesticated species has both negative and positive effects, anthropomorphism is a huge part of garnering public support for conservation, and its power to do so has yet to be fully understood and applied.

An example of anthropomorphism in action for an endangered species is the news frenzy surrounding the death of Southern Resident Killer Whale (SRKW) Tahlequah (J-35)'s calf and

her mourning of it. As Tahlequah mourned her calf, news articles describing her grief, NPR stories, and magazine features became a daily onslaught for Seattle locals and beyond. People identified with Tahlequah as a mother losing her child, an anthropomorphic construct that possibly changed the way people viewed killer whales. The outpouring of support from the public for the recovery of SRKW after hearing about the story is the reason for this thesis, as it represents the possibilities for other threatened and endangered marine life.

This thesis, *Anthrozoology, Anthropomorphism, and Marine Conservation: A Case Study of Southern Resident Killer Whale Tahlequah (J-35) and Her 'Tour of Grief'*, is broken into two parts. Part I introduces basic concepts. Chapter 1 discusses the emergence of anthrozoology. Chapter 2 digs into anthropomorphism and its effects on conservation. Part II presents a case study of a southern resident killer whale and her deceased calf. Chapter 3 explains the natural history of SRKW, including threats to their population and previous conservation efforts. Chapter 4 analyzes the media storm surrounding the death of Tahlequah's calf. Finally, the discussion shows how anthrozoology and anthropomorphism can work to improve marine conservation efforts, using Tahlequah as an example.

Part I: Basic Concepts

Part I of this thesis presents the concepts of anthrozoology and anthropomorphism. Specifically, it discusses how anthrozoology and anthropomorphism affect conservation and the interactions between humans and cetaceans. These concepts provide the reader with the background tools necessary to analyze Part II of this thesis, the case study of Southern Resident Killer Whale, Tahlequah, and her deceased calf.

Chapter 1. The Emergence of Anthrozoology

For centuries, humans have hunted, domesticated, manipulated, and consumed animals. Yet, all the while respecting, symbolizing, worshipping, conserving, and adoring them (Siddiq & Habib, 2016). The field of anthrozoology is the study of these relationships between human and nonhuman animals, with a focus on respect for animals and their rights, as well as the ways in which human life is shaped by animals. With this perspective, anthrozoology helps people to better understand the human condition. Anthrozoology is interdisciplinary as it ranges from the arts to the humanities, social, and natural sciences. This chapter introduces anthrozoology and remarks on its expansion into the field of marine affairs.

1.1 Origins

People have written about animals since Aristotle pioneered the first zoology book, *Historia Animālium (History of Animals),* in the 4th century (Dunn, 2005). As a philosopher, but also arguably the first natural scientist, Aristotle wrote the taxonomic reference book in an attempt to understand the natural world in a scientific way. He wrote in a purely biological manner, as seen in his introduction of taxonomy:

> "Animals differ from one another in their modes of subsistence,
> in their actions, in their habits, and in their parts"
> (Thompson, 2015, ebook translation [Aristotle, 350BCE]).

Post-Aristotle scientific studies continued on animals, their habitats, their populations, and their uses. Today, the biological literature is rich with life science studies, but it has only been recently that there has been research of how animals and humans interact and influence each other – thus creating a new field of study. Several terms have emerged in the academic world referring to the relationship between human Society & Animals. The two most prominent terms are *anthrozoology* and *human-animal studies (HAS)*, both of which have been used interchangeably.

Anthrozoology

Anthrozoology appears to have arisen before HAS, with the establishment of the academic journal*, Anthrozoös*, in 1987. The term has been defined in several compatible ways by prominent researchers in the field, as seen here:

1. Interestingly, anthrozoology as a term is not used in the description of *Anthrozoös* on the website, nor by the first editor, Andrew Rowan, in his first editorial, though he defines the field:

> "A vital forum for academic dialogue on human-animal relations, *Anthrozoös* is a quarterly, peer-reviewed journal that has enjoyed a distinguished history as a pioneer in the field since its launch in 1987. The key premise of *Anthrozoös* is to address the characteristics and consequences of interactions and relationships between people and non-human animals across areas as varied as anthropology, ethology, medicine, psychology, veterinary medicine and zoology. Articles therefore cover the full range of human–animal relations, from their treatment in the arts and humanities, through to behavioral, biological, social and health sciences" (*Anthrozoös*, 2019).

> "*Anthrozoös* will cover a wide range of topics, and although each issue may not provide each reader with an immediately relevant article, there should be something of value in every issue for those with a broad interest in human-animal interactions" (Rowan, 1987, pg. 1).

Andrew Rowan is currently executive vice president for Operations and CEO of Humane Society International, as well as president of The HSUS Wildlife Land Trust board of directors (Human Society Veterinary Medical Association, 2019). Rowan also serves on the committees of several animal protection groups, and despite his background in biochemistry, focuses on anthrozoological research. In his editorial for *Anthrozoös* he

wrote that journals should be used to stimulate the reader and promote scholarship and debate, which is perhaps why *Anthrozoös* was the first publication to take on an anthrozoological view, challenging other fields of science that view animals in less respectful ways.

2. Daniel Mills and Jeremy Marchant-Forde wrote the *Encyclopedia of Applied Animal Behaviour and Welfare,* in which they gave the definition:

> "Anthrozoology is the study of animal-human interactions Anthrozoology encompasses, but is not restricted to, study of the human–animal 'bond'. It should logically also include unsuccessful and dysfunctional interactions (although it rarely does)"
> (Mills & Marchant-Forde, 2010, pg. 28).

Daniel Mills is a biologist and professor of veterinary behavioral medicine, and Jeremy Marchant-Forde is a biologist and animal-research scientist. Coming from an animal science perspective rather than that of sociologists or psychologists, they describe anthrozoology as interactions between animals and humans, leaving no room for misinterpretation. Their encyclopedia definition focused mostly on the bond between companion animals and humans, and the development of empathy in children raised with pets.

3. Hal Herzog, a leading Anthrozoologist, defines anthrozoology in the Encyclopedia Britannica, and expands on it in his book *Some We Love, Some We Hate, Some We Eat*:

> "Anthrozoology is the study of the interactions and relationships between human and nonhuman animals. Anthrozoology spans the humanities and the social, behavioral, and biomedical sciences"
> (Encyclopedia Britannica online, 2019).

> *"*Anthrozoology transcends normal academic boundaries. Among our numbers are psychologists, veterinarians, animal behaviorists, historians, sociologists, and anthropologists. As in every science, anthrozoologists don't always see eye to eye. We differ in our attitudes toward some of the thorny moral issues that arise in human-animal relationships. We don't even agree on the name of our discipline. (some prefer to call it human-animal studies.) But, despite these differences, researchers who study our relationships with animals have a lot in common. We all believe that our interactions with other species are an important component of human life and hope that our research might make the lives of animals better" (Herzog, 2011, pg. 17).

Herzog is a psychologist, so his definition of anthrozoology includes a thoughtful discussion of why anthrozoologists study the relationships between humans and animals, concluding that it may make both human and animal lives better if we understand the relationships. He also mentions that anthrozoology and human animal studies are one and the same. Herzog's 2010 book will be further examined later in this chapter, but he does an excellent job of explaining the complex field of anthrozoology, and the hypocrisies in how people interact with and think about animals.

Human-Animal Studies (HAS)

The term human-animal studies (or human animal/human and animal/human-nonhuman animal) was officially put into use in 1993 with the creation of *Society & Animals,* the other leading journal in the field.

1. The website description of *Society & Animals*, followed by the description of Kenneth Shapiro, the first editor, defines human-animal studies as the scope of the journal:

> *"Society & Animals* is at the forefront of the emerging multi-disciplinary field of Human-Animal Studies, which explores

> the ways in which nonhuman animals figure in human lives. The journal publishes studies concerning experiences of non-Human animals from psychology, sociology, anthropology, political science, and other social sciences and history, literary criticism, and other disciplines of the humanities" (*Society & Animals* website, 2019).

> "…fostering within the social sciences a substantive subfield, animal studies, which will further the understanding of the human side of human/nonhuman animal interactions" (Shapiro, 1993, pg. 1).

Kenneth Shapiro has a PhD in clinical psychology, and is cofounder of the Animals and Society Institute, as well as Psychologists for the Ethical Treatment of Animals. He is the founder and editor of Society and Animals, and cofounder and coeditor of Journal of Applied Animal Welfare Science, as well as the editor of the Brill Human-Animal Studies book series (Animals & Society Institute, 2019). As a sociologist, Shapiro describes the works encompassed by Society & Animals as a mix of qualitative and quantitative, and he views the language humans use to describe animals as strong influencers of how humans treat them. Shapiro approaches HAS with something of a philosopher's point of view, and believes only focusing on human societies without including animal societies results in a naïve perspective of the world.

2. Margo DeMello, the of Human-Animal Studies at Animals & Society Institute, defines HAS in her book *Animals and Society: An Introduction to Human-Animal Studies* as:

> "Human-animal studies (HAS) – sometimes known as Anthrozoology or animal studies, is an interdisciplinary field that explores the spaces that animals occupy in human social and cultural worlds and the interactions humans have with them. Central to this field is an exploration of the ways in

> which animal lives intersect with human societies"
> (DeMello, 2012, pg. 4).

As an anthropologist, DeMello focuses on how animals influence human culture and societies. Notice that like Herzog, she remarks on HAS and anthrozoology as the same field of study, but differently than Herzog, she remarks on human society in her definition, not individual humans.

3. Dr. Clifton P. Flynn is a professor of sociology at the University of South Carolina Upstate, and he edited *Social Creatures*, one of the first books on human-animal studies. In the introduction to *Social Creatures* he writes:

> "The focus of HAS is the study of human-animal interaction. Ultimately, HAS asks: What can we learn about ourselves from our relationships with other animals? What does the way we think about and treat other animals teach us about who we are?"
> (Flynn, 2008, pg. xvi)

As a sociologist, Flynn studies HAS as a way to understand human behavior. Similar to DeMello, he examines the cultural aspects of human-animal relationships in his book, but he also looks at what humans can learn about themselves from animals, not just about their interactions.

These definitions of anthrozoology encompass a wide array of disciplines, which is good in that it shows the breadth of the field of anthrozoology. However, different disciplines affect what people want to get from the field, and therefore how they configure it, so it is constantly growing and changing shape.

1.2 Scope

There are many perceptions of animals and human relationships with animals, but in general, anthropocentrism, or a human-centered point of view, persists. One explanation of this phenomenon is that the creation of sociology distinguished human behavior from animal behavior, positing that human behavior is shaped by culture while animal behavior is purely instinctual (Siddiq & Habib, 2016). By doing this, human behavior was elevated to the highest status, and therefore, was considered to be more important. Anthrozoology brings new focus to this idea, and challenges the ethics and morality surrounding human-animal relationships in a predominantly anthropocentric society. While there are many topics in anthrozoology, they do not all hold equal weight with academics or the general public. For example, while most people are aware of the use of animals in labs, not many think about animals in religion and folklore. Raising pets, meat consumption, and the animal rights movement, on the other hand, are topics

Table 1.1 Themes in Anthrozoological Works

Bryant & Snizek (1993) On the Trail of the Centaur	
Animals and Human Culture	Animal-Related Crime and Deviance
Tha Bambi Syndrome	Animals in Art and Literature
Symbolic Dimensions	Cruelty Against Animals
Animals and Human Socialization	Animals and Politics
Animals and Anthropomorphism	Animals and Social Science
Animals and Leisure	
Human-Animal Work Systems	
Animals and Social Stratification	
Animals, War, and the Military	
Animals Creating Social Problems	
Cunningham (1995) Topics Awaiting Study: Investigable Questions on Animal Issues	
Animals as a Variable in Human Socialization	
Animal-Related Crime and Deviant Behavior	
Animals in Culture	
Animals in Sport, Recreation, and Leisure	
Animal-Related Occupations and Human-Animal Work Systems	
Animals in Politics (Public Policy, Law, and Sociopolitical Movements)	
Animals as a Social Problem	
Animals as Food, Products, and Artifacts	
Animals as a Variable in Social Stratification	
Animals in the Military	
Flynn (2008) Social Creatures: A Human and Animal Studies Reader	
An Emerging Field	
Studying Human-Animal Relationships	
Historical and Comparative Perspectives	
Animals and Culture	
Attitudes Toward Other Animals	
Criminology and Deviance	
Inequality - Interconnected Opressions	
Living and Working with Other Animals	
Animal Rights - Philosophy and Social Movement	
Herzog (2010) Some We Love, Some We Hate, Some We Eat: Why It's So Hard to Think Straight About Animals	
Anthrozoology: The New Science of Human - Animal Interactions	
Why We Think What We Think About Creatures That Don't Think Like Us	
Why do Humans (and Only Humans) Love Pets?	
The Human - Dog Relationship	
Gender and the Human - Animal Relationship	
The Comparative Cruelty of Cockfights and Happy Meals	
The Human - Meat Relationship	
The Use of Animals in Science	
Are We All Hypocrites?	
Dealing with Moral Inconsistency	
DeMello (2012) Animals and Society: An Introduction to Human-Animal Studies	
Human-Animal Studies	Working with Animals
Animal-Human Borders	Violence to Animals
The Social Construction of Animals	Human Oppression and Animal Suffering
Animals "in the Wild" and in Human Societies	Animals in Human Thought
The Domestication of Animals	Animals in Religion and Folklore
Display, Performance, and Sport	Animals in Literature and Film
The Making and Consumption of Meat	Animal Behavior Studies and Ethology
The Pet Animal	The Moral Status of Animals
Animals and Science	The Animal Protection Movement
Animal-Assisted Activities	The Future of the Human-Animal Relationship

nearly everyone comes into contact with during their lifetime, and have been studied relatively profusely.

The other most common human-animal interaction is that of the relationship with wildlife - humans are increasingly in contact with wild animals, and the repercussions and societal movements of that will be discussed in Chapter 2. There is no simple way to categorize all of the topics in anthrozoology, though a variety of volumes have been written in an attempt to do so. This chapter describes the scope of a few prominent researchers. Table 1.1 breaks down the topics addressed in five pivotal publications by leaders in the field, Clifton Bryant, William Snizek, Paul Cunningham, Clif Flynn, Hal Herzog, and Margo DeMello. The topics range from positive interactions (animals and leisure) to negative (animal related crime and deviance), and cover a wide variation in-between. However, there are only a couple that overtly focus on conservation, and none that directly mention marine mammals – although they may be discussed in "display, performance, and sport," or "animals, war, and the military." Quotes describing the scope of human-animal interactions from the aforementioned authors are as follows:

Clifton Bryan & William Snizek (1993):

Clifton Bryant, in partnership with William Snizek, summarized human-animal studies in 1993 in their article "On the Trail of the Centaur."

> "Research on the human-animal interface has had its popular topics and some of these have received considerable attention – animals as a positive factor in human health (both physical and mental), emotional bonds between humans and their companion animals, and human grief over the death of a pet. These and similar topics, constitute the largest segment of the human-animal literature. In all the attention given to the affective or expressive bond between human and animal, the instrumental bond may have been somewhat neglected. Much of the research has centered on companion animals, especially dogs and cats, with some attention to cage birds and aquarium fish. Many other species that interact with

> humans and affect their behavior--birds, fish, insects—
> have been neglected" (Bryant & Snizek, 1993, pg. 26).

The authors wrote through the perspective of social science, and remarked on where there has been focus (companion animals), as well as where there is a lack of research (other species that interact with humans but are not mammals). They also came to the conclusion that more work is needed in non-Western societies, as well as in cross-cultural comparative studies.

Paul Cunningham (1995):

Close to a decade after the emergence of *Anthrozoös*, a sociologist named Paul Cunningham remarked on the status of the field:

> "Unfortunately, social scientists' study of the role of animals in human society has not yet kept pace with society's consumptive use of animals. We know a lot about our attitudes toward animals but not much about the sociological variables behind our behavior and experiences of animals or how we learn to apply different standards in different situations. The psychosocial factors that support the use of animals in human society are not well understood and remain in need of study" (Cunningham, 1995, pg. 89).

The quote comes from a paper he wrote titled "Topics Awaiting Study: Investigable Questions on Animal Issues" that simply lists many of the unanswered questions in anthrozoology. He analyzes the field in an unusual way – rather than list what was known at the time, he listed topics that needed further exploration, possible questions for each topic, and an appendix of relevant research to choose from. He included topics such as animals as a variable in human socialization and their impacts on social stratification, as well as animals in sports in leisure.

Clif Flynn (2008):

Clif Flynn is the editor of *Social Creatures*, one of the earliest collections of human-animal studies. He is the provost senior vice chancellor for academic affairs and professor of sociology at the University of South Carolina Upstate (USCU, 2019). His human-animal studies are focused on animal abuse and how it relates to familial violence. He's been named a fellow at the Institute for Human-Animal Connections at the University of Denver (2010 - present), and as a fellow for the Oxford Centre for Animal Ethics in England (2008 - present) (USCU, 2019). Something Flynn details well in his introduction to *Social Creatures* is what HAS *isn't:*

> "HAS is not biology or animal behavior. There the focus is on the animals in a technical and specific way – their habitat, their feeding habits, their reproduction patterns, etc. – and particular, on their characteristics as a species, not as individuals. Neither is the emphasis on other animals' social relationship with human animals. Similarly, those who study animal science or welfare center on how the use of animals for human purposes can be improved. Other disciplines or studies that approach animals on the periphery, as commodities, as passive objects, as tools, as property – without examining and questioning those statuses, without respecting their lives, and without attempting to understand ourselves via investigations of our relationships with other animals – cannot legitimately be considered Human-Animal Studies" (Flynn, 2008, pg. xvi).

Flynn then went on to explain what HAS is, and explored basic concepts of the field, like anthropocentrism, anthropomorphism, and the use of anecdotes in scientific studies. Similar to *Animals and Society* by DeMello, *Social Creatures* is a well-rounded depiction of HAS.

Hal Herzog (2010):

Hal Herzog is one of the foremost researchers in the field, and has been investigating the psychology of human interactions with other species for 30 years. He has a PhD in psychology, and has published more than 100 journal articles and book chapters, as well as written for the

New York Times, Time Magazine, and others on topics that include the use of animals, the impact of pets on human health, and the evolution of pet-keeping (Psychology Today website, 2019). In 2013, Herzog received the Distinguished Scholar Award from the International Society for Anthrozoology, and in 2010 he wrote an entertaining and thought-provoking book called *Some We Love, Some We Hate, Some We Eat: Why It's So Hard to Think Straight About Animal*s. He says he wrote the book to "show how our interactions with animals reflect basic aspects of human nature. These include the roles instinct, culture, and language play in our lives" (Herzog, 2010). Using anecdotal evidence from years of interviews and research, Herzog addresses issues such as:

> "Does living with a pet really make people happier and healthier? Who enjoys a better quality of life, the chicken destined for your dinner plate or the rooster in the Saturday night cock fight? Is it wrong to feed a kitten to a boa constrictor?" (Herzog, 2010, back cover).

Herzog openly discusses all aspects of each argument and does not shy away from the grittier portions. However, he does not offer solutions for the cognitive dissonance or guilt they may cause in the reader re-evaluating his or her own choices regarding animals. This is because anthrozoology is a discipline that does not have straight-forward or clean-cut solutions. Human societal norms are constantly evolving, and with it, their treatment of animals.

Margo DeMello (2012):

Margo DeMello has a Ph.D. in Cultural Anthropology from U.C. Davis, teaches in the Anthrozoology Masters program at Cansius College, and is program director of Human-Animal Studies at Animals & Society Institute, to list a few of her qualifications (Margo DeMello website, 2019). She has written many books, but *Animals and Society* stands out by giving a thorough introduction to human-animal studies. She includes the history of human-animal studies, and breaks the textbook into "Constructing Animals: Animal Categories," "Using Animals: Human-Animal Economies," "Attitudes Toward Animals," "Imagining Animals:

Animals as Symbols," and "Knowing and Relating to Animals: Animal Behavior and Animal Ethics" (DeMello, 2012). The book website describes *Animals and Society* as

> "The first book to provide a full overview of human–animal studies, this volume focuses on the conceptual construction of animals in American culture and the way in which it reinforces and perpetuates hierarchical human relationships rooted in racism, sexism, and class privilege"
> (Columbia University Press Website, 2019).

DeMello's publication is considered to be the standard of human-animal studies, as she is one of the founders of the field and looks toward the future of HAS.

Bryant, Snizek, Cunningham, Herzog, DeMello, and Flynn are not the only researchers in the field of Anthrozoology. The International Society of Anthrozoology (ISAZ) was started in 1991 to create a place for the scientists and scholars in the growing field of Human-Animal Interactions (HAI) to come together and share their work. Officers and Board Members of ISAZ are elected biennially and come from all over the world. Most of the initial members were from the U.S.A. and the U.K., but many were from Switzerland, France, the Netherlands, Belgium, Italy, Australia, Germany, and Canada, providing different perspectives on current issues. As of today, ISAZ has over 300 organizations, researchers, students, and affiliates from almost 30 countries (ISAZ website, 2019). ISAZ acquired *Anthrozoös* in 2001, and aims to "promote the study of human-animal interactions and relationships, by encouraging and publishing research, holding meetings, and disseminating and exchanging information" (ISAZ website, 2019). The hundreds of members of ISAZ, along with countless other researchers in multiple disciplines, are all studying the expanding field of Anthrozoology, and it gains traction every day.

1.3 Anthrozoology and Cetaceans

Cetaceans (whales and dolphins), spark fascination in children and adults alike, even though the majority of their lives are spent underwater and out of sight to humans. According to a survey assessing zoo and aquarium visitors' perceptions of dolphins, people describe them as

cute, happy, playful, friendly, smart, intelligent, and communicative (Fraser et al., 2006). While many people learn about whales and dolphins primarily from television (Sickler et al., 2006), they have strong opinions about them, including their use in marine mammal parks, military endeavors, and as food, as well as their conservation in the wild. Cetacean and anthrozoological human interactions are the focus of each portion of the "Basic Concepts" section of this thesis (i.e. anthrozoology, anthropomorphism, and anthropomorphism in conservation) because of the wide array of anthrozoological topics concerning cetaceans, and their application to the case study concerning killer whales (*Orcinus orca*) later on.

Instead of relying on anecdotal evidence of cases of anthrozoology concerning cetaceans, a literature review was conducted for anthrozoological papers focused on cetaceans, meaning the studies fit into the parameters delineated in the definitions of anthrozoology given earlier. While there are anthrozoological articles in many journals, the best examples of anthrozoology are in *Anthrozoös* and *Society & Animals* because they aim to describe relationships between cetaceans and humans, while other journals have different purposes. Anthrozoology does not study cetaceans in isolation, unlike biology. Nor does it study cetaceans purely for management applications. Anthrozoology is not as constrained, and looks for connections between humans and whales/dolphins. However, this literature review found that there were far fewer articles on cetaceans in *Anthrozoös* and *Society & Animals* than there were on other species, such as dogs and other companion animals. Each journal was searched for the terms "dolphin," "whale," and "cetacean," for all issues available online. While this search may not have captured every paper that discusses cetaceans, it did bring up the majority of the papers on cetacean and human interactions that fell into the parameters for anthrozoological research.

Inspection of Table 1.2 *References to Cetaceans in two Anthrozoological Journals* shows that a very small percentage of articles in the journals mentioned whales or dolphins in the title. A few articles that discuss cetaceans may have been missed because they were not in the title search, however, it is likely they were not the focus of the research. The 1-2% of anthrozoological articles on cetaceans suggests that there is much that has not been studied yet.

Table 1.2 References to Cetaceans in two Anthrozoology Journals

Journal	Years available online	# of issues	# of articles	# of articles focused on cetaceans	% total articles on cetaceans
Anthrozoös	1987-2019	~128	~1,700	~16	1%
Society & Animals	1999-2018	~89	~445	~9	2%

The papers that focused on cetaceans were sorted into categories and provided here:

Anthropomorphism:

- "The True Rescuers: Big Miracle, Dolphin Tale, and Buck
  Porter, Pete, *Society & Animals* (2014)
- "From Blubber and Baleen to Buddha of the Deep: The Rise of the Metaphysical Whale"
  Zelko, Frank, *Society & Animals* (2012)
- "Dolphins in Popular Literature and Media"
  Fraser, John; Reiss, Diana; Boyle, Paul; Lemcke, Katherine; Sickler, Jessica; Elliott, Elizabeth; Newman, Barbara; Gruber, Sarah, *Society & Animals,* (2006)
- "Moby-Dick and Compassion"
  Armstrong, Philip, *Society & Animals,* (2004)
- "Social Narratives Surrounding Dolphins: Q Method Study"
  Sickler, Jessica; Fraser, John; Webler, Thomas; , Diana; Boyle, Paul; Lyn, Heidi; Lemcke, Katherine; Gruber, Sarah, *Society & Animals* (2006)
- "A Cautionary Tale: The Whale Caller"
  Woodward, Wendy, *Society & Animals,* (2007)

Dolphin Therapy:

- "Dolphin-assisted therapy: more flawed data and more flawed conclusions"
  Lori Marino and Scott O. Lilienfeld, *Anthrozoös,* (2007)
- "Dolphin-assisted therapy: changes in interaction and communication between children with severe disabilities and their caregivers"

Erwin Breitenbach, Eva Stumpf, Lorenzo v. Fersen, and Harald Ebert, *Anthrozoös,* (2009)

- "Reinforcement effectiveness of animatronic and real dolphins"
  David E. Nathanson, *Anthrozoös,* (2007)
- "Animal-assisted therapy: a meta-analysis"
  Janelle Nimer and Brad Lundahl, *Anthrozoös,* (2007)
- "The effect of dolphin-assisted therapy on the cognitive and social development of children with down syndrome" (2014)
  Richard E. Griffioen and Marie-Jose Enders-Slegers, *Anthrozoös*
- "The view from all fours: a look at an animal-assisted activity program from the animals' perspective"
  Alison Hatch, *Anthrozoös*, (2007)
- "Dolphin-assisted therapy with parental involvement for children with severe disabilities: further evidence for a family-centered theory for effectiveness"
  Erwin Breitenbach and Eva Stumpf, *Anthrozoös*, (2014)

Whaling:

- "Awareness of whale conservation status and whaling policy in the US--a preliminary study on American Youth"
  E.C.M. Parsons, J. Patrick Rice, and Laleh Sadeghi, *Anthrozoös*, (2010)
- "Three Faces of Advocacy: The Cove, Mine, and Food, INC."
  Woodson, Mary Beth, *Society & Animals* (2011)

Many of these articles are focused on how cetaceans can assist people; for example, dolphins are often used in therapy for disabled children, and these interactions have been heavily studied to interpret their success. Others focus on how humans affect cetaceans, mostly negatively, by examining conservation and whaling impacts. A few looked at cetaceans in cinema and literature, but none discussed cetacean emotion or cognition, and how this can be affected by humans and vice versa.

1.4 Chapter Summary

This chapter has remarked how the fields and literatures of anthrozoology and human-animal studies (HAS) emerged concurrently in the late twentieth century. Because of the great similarity of topics addressed in the two fields—and also because no one has argued that there is any utility in regarding the two fields as in any way different from one another—the term *anthrozoology* is used for convenience in this thesis for studies labeled as either anthrozoology or HAS.

The definitions of anthrozoology and its scope all have to do with the interaction of humans and other animals. However—and as Flynn (2008) has pointed out—the approach of anthrozoological analysts is not to be confused with those of other researchers. For example, anyone who reports on human-animal interactions from disciplinary perspectives found in the academic journals of biology, animal behavior, animal science, animal welfare, and other journals that regard animals in instrumental terms (e.g., as commodities, passive objects of investigation, as tools, or as property) are not considered to be anthrozoological.

With the overlapping descriptions of the field and scope presented in this chapter, anthrozoology research can be distinguished from non-anthrozoology research because anthrozoology studies are:

1. Motivated by an interest in how the lives of people are shaped by interactions with animals
2. Motivated by respect and compassion for animals and an interest in their rights
3. Focused on individual animals as opposed to the larger populations or species
4. Published in journals (e.g., *Society & Animals, Anthrozoos*) and volumes (e.g., *Animals and Society, Social Creatures*) with names that identify the field

With this orientation, anthrozoology researchers have examined a diverse set of issues and themes (Table 1.1). In the chapters to follow, two themes—anthropomorphism and conservation—are considered, especially in the context of human-cetacean interactions.

Chapter 2: Anthropomorphism

Anthropomorphism has many definitions that depend on the context they are used in. However, in their most basic form, all of the definitions describe anthropomorphism as the attribution of human traits to other non-human entities. This chapter will introduce anthropomorphism and its use in the context of anthrozoology.

2.1 Anthropomorphism Defined

Origins:

The noun *anthropomorphism* was derived from the verb *anthropomorphize*, which comes from the Greek *ánthrōpos* (meaning human), and *morphē* (meaning form). The Oxford English dictionary defines it as the attribution of human characteristics or behavior to god, animal, or object (Oxford Dictionary, 2019), and its first traceable use as a term was in 1753 about the heresy of giving a human form to the Christian God (Oxford Dictionary, 2019). However, examples of anthropomorphism are found far earlier than the etymological history.

Anthropomorphism is thought to have come from the ability of humans to use self-knowledge to understand and predict the behavior of others (Humphrey, 1983). This ability is what helped Homosapiens out survive Neanderthals. Archeological records show they were able to make predictions about the movements and behavior of the species they were hunting by getting in the mind of the animal, and therefore able to create a plan of attack. Neanderthals, on the other hand, were more opportunistic in their hunting methods, and were thus outcompeted and out survived by Homosapiens (Mithen, 1996). A little more recently, anthropomorphism was traced to the beginnings of modern human behavior (40,000 years ago) with the finding in Germany of a 32,000-year-old ivory sculpture of a human-shaped figurine with the head of a lion (Dalton, 2004).

Not only did anthropomorphism influence ancient human behavior and art, it also was also a well-used literary device that is still seen in modern literature. Although there are earlier works, Aesop's fables are perhaps the most well-known collection of tales that utilize anthropomorphism. Aesop was a slave and storyteller who lived in Greece between 620 and 564 BCE (Gibbs, 2002). His stories were religious, political, and social commentaries that used animals to portray human personalities and behaviors. For example, his fable "The Wolf and the

Lamb" represents a victim being falsely accused and killed despite his innocence. The moral of the story was that a tyrant will always find an excuse to get his way, and the unjust will not listen to the reasoning of the innocent (Aesop, ~6th century, BCE). Many of the stereotypes for animals recognized today come from these tales (aka, the wily fox or the proud lion).

Definitions:

Anthropomorphism is present throughout human history, and has many definitions. A sampling of which are shown here:

1. Some definitions describe anthropomorphism as applying human traits to non-human entities, as Epley et al. do in their paper "On seeing human: A three-factor theory of anthropomorphism":

   > "Anthropomorphism describes the tendency to imbue
   > the real or imagined behavior of nonhuman agents
   > with human-like characteristics, motivations, intentions,
   > or emotions" (Epley et al., 2007, pg. 864).

   Nicholas Epley is a professor of behavioral science, while the other authors of the paper, Adam Waytz and John Cacioppo, are professors of psychology (University of Chicago, 2019). Their definition of anthropomorphism is more anthropocentric than others because it does not specifically mention animals as the focus of anthropomorphism.

However, many definitions specify that anthropomorphism is the attribution of human characteristics to non-human animals, not just to objects:

2. Pamela Asquith is cited in many anthropomorphism studies for her early definition of anthropomorphism in the context of animal behavior as the ascription of human mental experiences to animals (Asquith, 1984). Armed with her doctorate on anthropomorphism and ethology, Asquith spent many years studying the Korean and Japanese views of

'souls' in animals and objects, and the anthropology of science (Pamela J. Asquith Index, 2019). She comes to the conclusion that vocabulary is at the heart of anthropomorphism:

> "…firstly, vocabulary, for anthropomorphism is always ultimately about our use of words and what they can and cannot tell us about the animals. We can ask where our words take us in terms of our empirical knowledge, but, as importantly, where they take (or leave) the animals. In particular, the distinction between ordinary language terminology, which tends to attribute agency to animal actors, and technical language, which attempts to avoid that, is at the heart of the primatological field reports" (Asquith, 2011, pg. 239)

Asquith's unique research background gives her an interesting perspective on how human language is the basis of anthropomorphism, but also on how human understanding of animal's lives and experiences are limited.

3. In his paper, "Anthropomorphism, primatomorphism, mammalomorphism: understanding cross-species comparisons" Brian Keeley addressed the existence of anthropomorphism in animal studies by saying:

> "Anthropomorphism in the study of animal behavior is placed in its original, theological context" (Keeley, 2004, pg. 521)

Keeley is a professor of philosophy (Pitzer Faculty, 2019), so rather than just define anthropomorphism, he looked at how it fits into the context of human religions historically.

4. In his pivotal book, *The New Anthropomorphism,* where he critiqued many definitions of anthropomorphism, J.S. Kennedy agreed with Pamela Asquith's 1984 definition (listed above). He further commented:

> "The main point I want to make is that the scientific study of animal behaviour was inevitable marked from birth by its anthropomorphic parentage, and to a significant extent it still is" (Kennedy, 1992, pg. 3).

As a psychological anthropologist (University of California Senate, 2019), Kennedy was mainly interested in how anthropomorphism influenced research in varying fields. In *The New Anthropomorphism,* he criticized many anthropomorphism definitions, except those which pertained to animals and biological sciences. This is because he believed animal studies could not be conducted without anthropomorphism, whether intended or subconscious.

5. In his paper, "Anthropomorphism and Anthropomorphic Selection - Beyond the 'Cute Response'" James Serpell used:

> "Anthropomorphism - here defined as the attribution of human mental states (thoughts, feelings, motivations and beliefs) to nonhuman animals" (Serpell, 2002, pg. 83).

Serpell is a professor of animal ethics and welfare (PennVet Faculty, 2019), so he mostly studies anthropomorphism to understand how it influences human treatment of animals.

6. In another paper, "What are Animals? Why anthropomorphism is still not a scientific approach to behavior," Clive Wynne used:

> "Anthropomorphism - the ascription to animals of human psychological qualities" (Wynne, 2006, pg. 125).

Clive Wynne is a behavioral scientist and psychology professor, but is more focused on how animals think and behave (ASU Department of Psychology). Anthropomorphism

can skew these findings, so he discusses its applications and why he does not think they are useful in “What are animals?...”

For the purposes of this thesis, anthropomorphism will be defined in the context of animals, meaning the attribution of human characteristics and traits to nonhuman animals.

2.2 What Entities are Anthropomorphized?

Anthropomorphism is a fascinating topic in its own right, and it is not always aimed at animals. People name their cars, captains name their ships after women, and some people have even fallen in love with inanimate objects (Epley et al., 2007). However, animals are the most frequent nonhuman targets of anthropomorphism because humans are instinctively biophilic (Wilson, 1984). From a young age, people tend to attribute human characteristics to animals. They notice when their dogs are “happy” or “pouting,” say wild predators are “angry” when they may just be defending their territory, and think raccoons are “mischievous” because their coloring is similar to a thief wearing a mask.

Anthropomorphized animals are pervasive in human cultures, and reach the public through many outlets. In western culture they can be seen in tv, movies, adult literature, music, children’s books, myths/folklore, magazines, mascots, marketing, video games, toys, and news media. The amount of anthropomorphism in everyday lives suggests it may have a powerful influence on human behavior. This is important because the general public contributes to the degradation (as well as the repairs) of global ecosystems, and thus needs to be convinced that natural biodiversity needs to be protected (Chan, 2012). The focus on anthropomorphized animals offers an opportunity to engage the public in conservation by fostering empathy for target species through stressing that animals share many human characteristics.

Table 2.1 provides a brief list of anthropomorphized animals in different forms (from this author’s research). They are pervasive throughout many human cultures, but this thesis will stick with western popular culture. Often, anthropomorphized characters are present across mediums, for example, Snow White is a children’s book, movie, and ballet. It is worth noting that while these are fairly clear examples of anthropomorphized animals, not everyone will relate to them in the same way.

Table 2.1 Examples of Anthropomorphism of Animals in Western Popular Culture

Movies	TV	Literature	Children's Books	Western Holidays
Finding Nemo	SpongeBob SquarePants	Moby Dick	Winnie the Pooh	Halloween costumes
Flipper	The Wild Thornberrys	Animal Farm	Black Beauty	Santa's reindeer
Frozen	Teenage Mutant Ninja Turtles	Harry Potter	Charlotte's Web	Easter bunny
How to Train your Dragon	Zoboomafoo	The Chronicles of Narnia	Bambi	Thanksgiving "pilgrim" turkeys
The Lion King	Sesame Street	The Jungle Book	The Very Hungry Caterpillar	Punx. Phil (Groundhog's Day)
Video Games	**Dance**	**Mascots**	**Marketing**	**Toys**
Sonic The Hedgehog	Swan Lake	US Democratic Party: donkey	Charmin bears	Beanie Babies
Super Mario Bros	The Nutcracker	US Republican Party: elephant	Energizer bunny	Tomagotchi
Donkey Kong	Carnival of the Animals	Seahawks mascot: osprey	Smokey the Bear	My Little Pony
Pokemon	Don Quixote	Mariners mascot: moose	Geico gecko	American Girl pet friends
Frogger	Snow White	Seawolves mascot: killer whale	Tony the Tiger	Furby

While all kinds of species are anthropomorphized in Western popular culture, studies have shown that humans are naturally attracted to and feel more empathy for those that they perceive to be similar to them (Meyers et al., 2009). Similarities to humans are more pronounced in terrestrial mammals than others, and are likely the reason people are more willing to pay for the conservation of animals than plants, and vertebrates over invertebrates, despite the importance of the roles of those organisms in their respective ecosystems (Martin-Lopez, Montes, Benayas, 2007).

This pattern continues with allocation of government funds - species that are similar to humans either phylogenetically or by appearance receive a larger share of conservation funds or policy focus (Urquiza-Haas & Kotrschal, 2015). In fact, the closer the resemblance to humans, either morphologically or behaviorally, the more humans anthropomorphize them. This is the case for charismatic and sublime megafauna, or, animals that are perceived as beautiful/cute, or awe-inspiring/terrifying, respectively. Why charismatic megafauna, and to a lesser extent, sublime megafauna, are so important in the conservation world when it comes to attracting donations will be discussed later in this chapter.

2.3 Is Anthropomorphism Good or Bad?

For as long as anthropomorphism has been present in human history, people have gone back and forth on whether its influence is negative or positive. In purely scientific studies (think Aristotle's examination of anatomy, or medical testing on lab animals) anthropomorphism is considered bad because it invokes empathy and can bias or cloud results (Wynne, 2004). In labs or on farms, people need to be able to distance themselves emotionally because it becomes much

harder to kill another living being if they empathize with it (Herzog, 2010). On the other hand, anthropomorphism in applied sciences (think conservation or policy making) can benefit the work rather than detract from it because it can inspire caring and subsequent action from the public; many people develop anthropomorphic understandings of species through their representations rather than through interactions in nature (Root-Bernstein et al. 2013). Plus, anthropomorphism of animals in children's literature has been shown to increase their knowledge of biological facts because they identify with the animal and pay closer attention to it (Markowsky, 1975).

The empathy invoked by anthropomorphism can create moral dilemmas (Herzog, 2010). An example Hal Herzog (an anthrozoologist mentioned earlier in this thesis) gives in his book *Some We Love, Some We Hate, Some We Eat* is the relationship humans may have with eating other animals. A person may eat meat because it is a natural thing to do, and being a vegetarian or vegan may not appeal to them. But that same person may feel bad for their choices, knowing commercial livestock generally live miserable lives before being slaughtered for grocery store packaging (Herzog, 2010). This conflict can lead to cognitive dissonance, an uncomfortable feeling where the brain cannot reconcile two beliefs. Their solution to feeling better may be to buy "free-range, organic, ethically raised" meat, and whether or not the labels are true, they may be less uneasy knowing they are trying to make ethical choices (Herzog, 2010). The human-meat relationship is not the only moral grey area invoked by anthropomorphism, but it is one of the more common issues because most people in western society eat meat and are aware of where it comes from, though they often choose not think about it (Webster, 1994). Another example of this struggle is a letter to Hal Herzog from one of his friends, describing the internal conflict she struggles with when butchering her livestock:

> "Hal,
> We just took our pigs to the butcher this morning.
> It's amazing how complex our psyches must be in
> order to nurture creatures every day for seven months,
> only to have them sent away and then come home in
> little freezer packages. Or sometimes butcher them
> ourselves.

> *I think it takes bravery, don't you?*
> I think of all the millions of humans over time who have hunted and raised animals for food because that was the way you survived. But you need to make it right in your conscience. Maybe reverence helps. Maybe killing the creature yourself helps. It completes the cycle somehow. Taking responsibility is somehow the balm that soothes the horror.
> Blessings to you and Mary Jean and to our pigs"
> (Herzog, 2010, pg. 203)

The woman in the letter addresses the moral difficulty she has with slaughtering animals she raised and anthropomorphized, and how she can only soothe the cognitive dissonance she feels from the situation by taking responsibility and understanding it is the cycle of life for predators to eat prey. Humans are no longer just struggling to survive by hunting other animals though, which is why anthropomorphism even has an impact – people have evolved to empathize with other animals. This renders anthropomorphism a double-edged sword – while it can preclude unbiased data and compromise fact-based results in pure scientific studies (Chan, 2012), it can also improve applied sciences like conservation by tugging on people's heart strings.

Perspectives of anthropomorphism in scientific literature:

Most previous discussions of anthropomorphism in scientific literature focus on its lack of validity when describing and interpreting animal behavior (Serpell, 2002), while more modern studies have ascribed many benefits to the use of anthropomorphism in applied sciences. Still others remain neutral, discussing the benefits but also cautioning against relying on anthropomorphism too much. The following quotes are examples of all three perspectives:

Bad:

> In Clifton Flynn's book, *Social Creatures*, he argues that the irony in scientists avoiding anthropomorphism is that the more they have studied animals in a detached way, the

more they have learned about their complex cognitive and emotional capabilities (Flynn, 2008). However, this quote in the beginning of his description of anthropomorphism is clear on the negative aspects of anthropomorphism:

> "In the scientific community, using language that suggests animals have intentions, desires, and emotions has been severely criticized as lacking objectivity. One of the worst sins a biologist could commit was to assume that animals shared some of the same mental, social, and emotional capacities that humans do. Scientists would go out of their way to overlook evidence of mindedness, selfhood, personality, and agency"
> (Flynn, 2008, pg. xv)

Clive Winne is an example of a scientist very much against anthropomorphism in scientific research. In a previous paper he argued that "the reintroduction of anthropomorphism risks bringing back the dirty bathwater as we rescue the baby," (Wynne, 2004) meaning that the modern resurgence of anthropomorphism in applied sciences, while constructive, will also bring back the negative biases associated with it. In a follow up paper he continues his point with:

> "Anthropomorphism comes very naturally to human beings. We must be continuously on our guard against it… Its drawbacks remain the same as they have always been: mentalistic folk-psychological accounts of animal psychology have no useful role to play in a modern objective science… The study of animal cognition will only proceed effectively once it rids itself of pre-scientific notions like anthropomorphism"
> (Wynne, 2007, pg. 134)

Neutral:

Meredith Root-Bernstein et al. wrote a paper titled "Anthropomorphized species as tools for conservation: utility beyond prosocial, intelligent and suffering species," in which they praised the use of anthropomorphism in conservation. However, they also cautioned that this promotion of empathy between humans and wild animals may leave less 'desirable' species out, even if they are of ecological importance. For example, while charismatic species like tigers draw donations and conservation action, others, like frogs, are empathized with less.

> "Recently, the role of anthropomorphism as a useful tool for conservation outreach and environmental education has been gaining attention. However, we believe that most conservationists still underestimate the breadth of applicability of anthropomorphism to conservation, and are likely to be unaware of research from the social sciences making clear anthropomorphism's potential as a powerful but double-edged sword"
> (Root-Bernstein et al., 2013, pg. 1578).

Good:

In the *Encyclopedia of Applied Animal Behaviour and Welfare,* Daniel Mills and Jeremy Marchant-Forde gave a history of anthropomorphism, but overall were for its use, arguing that it is absolutely ingrained in everything that humans do, and to try to avoid it would be futile. They also point out that in modern day science, anthropomorphism can be used to improve animal welfare:

> "With the expanding research into animal minds has come the general realization that anthropomorphism does not disrupt scientific observation but supports the continuity between humans and animals."
> (Mills & Marchant-Forde, 2010, pg. 28).

As a follow-up to his earlier dismissal of anthropomorphism, Clifton Flynn came to the conclusion that while it needs to be used carefully so as to not cause undue harm, anthropomorphism is a beneficial phenomena for the treatment of animals and human's understanding of their bonds with them:

> "So anthropomorphism, if used wisely, doesn't have to be one of science's most serious transgressions. If we can employ it critically to reach reasonable conclusions, without misrepresenting the animal's nature or needs, then it could help us not only understand other animals and our relationships with them better, it might influence how we think about and treat them as well"
> (Flynn, 2008, pg. xvi).

Given the above examples, can it be concluded if anthropomorphism is good or bad? There does not seem to be a clear answer; it depends on the perspective and goals of the person using it, whether on purpose or subconsciously. What is agreed upon by everyone involved, however, is that anthropomorphism is pervasive in human culture, and tends to influence human decisions, whether desired or not.

2.4 Anthropomorphism in Conservation

As this chapter has established, anthropomorphism can be used as a powerful tool in promoting conservation considerate behavior by highlighting research that promotes animals as being similar to humans (Chan, 2012). The anthropomorphic charisma a species has is often based on the recognition of features shared with humans, such as care of young, pair bonding, or playing (Root-Bernstein et al., 2013). This is especially effective when the species in question is considered charismatic megafauna, or, considered compelling because they are viewed as beautiful, impressive, or cute. A study found that there are stronger efforts to conserve some species over others, simply because the animal is perceived to be physically attractive (Gunnthorsdottir, 2001). Similar to charismatic megafauna, sublime megafauna are species that are awe-inspiring or terrifying, and draw the interest of the public. The increased funding, habitat

protection, and policy support for these species due to their perception by the general public can lead to more conservation successes, but ironically, many of these species also happen to be endangered. Figure 2 is a table from a study showing the twenty most charismatic species (in Western culture). Surveys were used to rank the species, *using rare, endangered, beautiful, cute, impressive*, and *dangerous* as the traits to score (Albert et al., 2018). Note that most are large, exotic, terrestrial mammals, and that sharks, dolphins, and whales have close to the same scores.

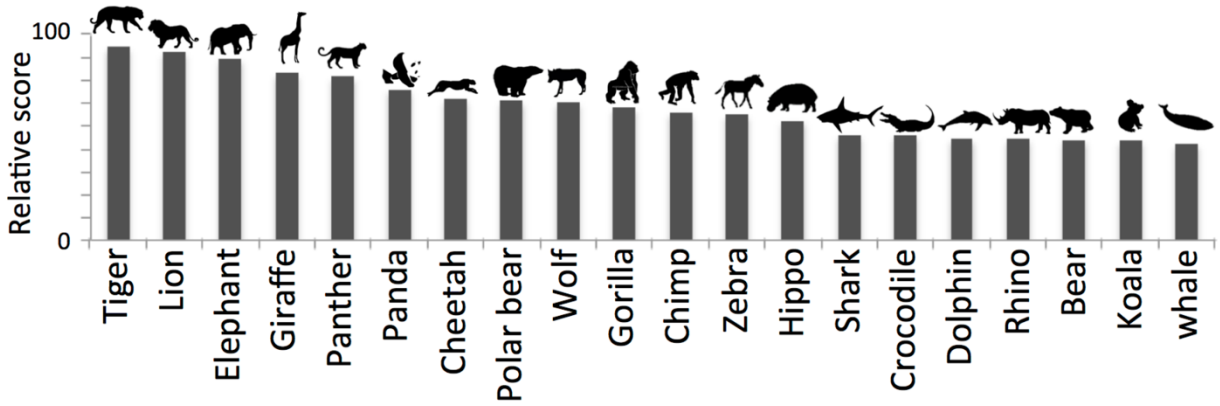

Figure 2.1 The Twenty Most Charismatic Species (Albert et al. 2018)

Many charismatic/sublime species are also flagship species, or species selected to act as an ambassador or symbol of an environmental issue or campaign (Cluclas et al., 2008). They are generally large, recognizable, terrestrial mammals, and conservationists have been using these flagship species in their marketing to promote conservation actions for years (Root-Bernstein et al., 2013). One example is the World Wildlife Fund (WWF). WWF began in the 1960s with an image of a giant panda as its logo because it was one of the few animals that would look good when printed in black and white (Nicholls, 2011). Over time, pandas became the recognizable symbol of endangered species conservation. Big, furry, and "cute," their appearance resulted in people caring about them more than less attractive species, such as salamanders. Having the giant panda as the logo of the WWF was therefore important because people will donate to save a "cute cuddly panda," and that money could also be used for other endangered species that were not as endearing as pandas. Over the last fifty+ years WWF has become one of the largest international conservation organizations in the world and the logo has not changed, proving how effective charismatic megafauna can be as ambassadors for their wild counterparts (Nicholls,

2011).

Not only is the WWF panda a flagship species, the logo has evolved over the years to become more anthropomorphized – the panda went from fairly realistic to looking like a plush toy children would play with (Nicholls, 2011). The edited and anthropomorphized panda logo was either deliberately designed or culturally evolved to suit social, cultural, and economic roles and desires (Brown, 2010). AS WWF has proved, this combination of using charisma and empathy to garner public support works, and many other organizations have followed suit. See Figure 2.1 for a visual list of environmental non-profit organizations that use flagship species as their icon.

Figure 2.2 Environmental Non-Profit Logos

Using charismatic and sublime species to draw in conservation efforts because people anthropomorphize them and thus identify with them is a powerful tool. However, limiting the use of anthropomorphism in conservation to intelligent, social, suffering mammals can make it seem like other species are not worthy of conservation because they are not like humans in the "right" ways. It can also mean overlooking low-profile (aka less charismatic or attractive species) that have high biological conservation value (Root-Bernstein et al., 2013). Other potential problems

with anthropomorphizing a charismatic species is that the heightened level of care from the public for that species may lead to outrage over a competitor or predator species, leading to support of killing the species that poses a threat to the charismatic one. A similar biodiversity worry is that humans have been proven to be willing to contribute to other humans in need when the help is focused on the story of a single individual, yet will become indifferent when the individual in need becomes just one of many (Root-Bernstein et al., 2013). This indifference impacts humanitarian non-profits, and has the potential to do the same with environmental campaigns because ecosystems and biodiversity are complex and made up of many species, not just the popular ones drawing attention.

Anthropomorphism can also backfire by creating expectations of human-like social behavior that non-human species cannot satisfy (Root-Bernstein et al., 2013). For example, people always seem to be shocked when they are attacked or bitten by a wild animal they were trying to feed or take a picture with. They cannot believe that the cute sealion would bite a little girl, when he was clearly so 'playful.' This even happens with domestic animals – as much as dogs are social creatures and have evolved to be a part of human family structures, they have different behavioral cues than humans. A dog bares its teeth in fear or aggression, but to humans, bared teeth are a smile, signaling happiness or a good mood. This misreading of behavior can lead to biting mishaps, and often the dog will have the losing end of the bargain and be put down. The same applies to animals forced to perform (think circus bears or killer whales at SeaWorld) where the animals have been highly anthropomorphized and so are thought to be 'safe' and 'tame' and 'enjoy' human interactions, when in reality, they are performing as they have been trained to do, and may lash out at inappropriate interactions.

While its drawbacks are discussed here, anthropomorphism is overall a very powerful tool for conservation. Creating empathy for a flagship species, whether charismatic or sublime, draws in support for conservation measures, and that targeted support can then be carefully spread to the other species in need that may not be as high-profile or attractive. Perhaps because they are out of sight underwater, marine species are not as represented on the popular charismatic megafauna list. However, marine mammals like dolphins, polar bears, and sea lions are often anthropomorphized, so their use as charismatic ambassadors could be highly beneficial for conservation campaigns surrounding the ocean.

2.5 Anthropomorphism and Cetaceans

Because humans identify with and anthropomorphize animals more when they are perceived to be similar in intelligence or behavior (Meyers et al., 2009), cetaceans are often anthropomorphized. Whales and dolphins are described as playful, mischievous, loving, and cunning by visitors to aquariums and in surveys of people who have seen cetaceans on tv or in movies (Fraser et al., 2006). These perceptions of cetaceans can influence conservation efforts, as well as anti-whaling and captivity sentiments. See Figure 2.2 for a short history of commercial whaling, and how anthropomorphism has caused an international debate between pro-whaling countries and anti-whaling countries.

The Google search engine was used to provide a sample of anthropomorphism of cetaceans in both peer-reviewed literature and news media. For peer-reviewed papers, Google Scholar was used, with a combination of 'anthropomorphism, cetaceans, whales, or dolphins' as the search terms. The actual word 'anthropomorphism' was used in the search because the research being reviewed was completed by scientists. As a rule, scientists view anthropomorphism as bad so they would be careful not to include it in their studies accidently. Unlike the scientific literature search, the review of news media and magazines was conducted by searching for titles in Google News that included a combination of 'cetaceans, whales, dolphins, culture, playing, emotions, and intelligence.' This is because anthropomorphism in the news is likely to be accidental, or at least not strictly controlled for like a scientific study. 'Culture, playing, emotions, and intelligence' are all anthropomorphized words used to describe cetaceans (Fraser et al., 2006) so they were included in the search. It should be noted that this search was not exhaustive, and that there are surely more studies and articles that research anthropomorphism of cetaceans (or that anthropomorphize cetaceans themselves) that do so within the text and not in the title. The papers selected were picked to show a diversity of topics, and because the titles explicitly reference anthropomorphism. The selected titles are listed below, along with an analysis of their topics:

HISTORY OF COMMERCIAL WHALING

The first record of commercial whaling is that of the Basques catching black right whales in the North Atlantic in the 12th century (Gambell, 1992). Those stocks were eventually depleted, so the whalers moved further offshore, until the North American coast was reached in the 16th century. The British and Dutch moved north to hunt bowhead whales in the Arctic in the 17th century, and sperm whales became a worldwide target in the 18th century. By the 20th century, bowhead whales, southern and northern right whales, and gray whales were all seriously depleted (Gambell, 1992). Whaling was initially done from sail or oar-powered boats with hand harpoons and lances, but by the late 19th century, European, Norwegian, American, and Japanese whalers were all using cannon harpoons and nets (Gambell, 1992). The new technology insured more catches, and thus, increasingly endangered whale stocks. The devastating decline of stocks led to and the creation of the International Whaling Commision (IWC) in 1946, and an eventual pause on commercial whaling in 1986. The IWC is made up of almost all the major whaling nations, and introduced a moratorium on the previously uninhibited whale hunts to help recover the depleted stocks of several species.

While the 1986 moratorium banned commercial whaling, it still allowed scientific whaling, or permits that countries can use to hunt whales for the use of science, but not for profit or consumption. Japan harvests hundreds of whales each year under this clause, and has been caught illegally selling whale meat for profit, as well as harvesting endangered whales (Baker et. al, 2000). This disregard for international marine mammal protection laws has had Japan in conflict with other countries for decades. This conflict may be what has lead Japan to announce it's withdrawal from the IWC and its plans to reinstate commercial whaling in 2019 off of its coast (although no longer in Antarctic waters) (National Geographic, 2019). There are no formal records of it yet to cite, but several news sources have reported it directly from Japanese sources. If Japan follows through, it will be joining Norway and Iceland in their continued commercial hunting of whales.

The global pressure on Japan, Norway, and Iceland to stop whaling is not shocking, considering how high whales are on the food chain, their intelligence, and their complex social structures. Cetacean cognition is similar to humans when it comes to language comprehension, self-recognition ability, and social behavior (Marino, 2002). Humans are naturally attracted to animals that are similar in intelligence and/or looks, which results in heightened empathy for those animals (Meyers et al, 2009). However, human cultures play a role in perceptions of wildlife, and this can lead to major disagreements among the public when it comes to wildlife management decisions - especially the killing of popular and anthropomorphised animals like whales (Hamazaki & Tanno, 2001). Because of this, sustainable commercial whaling is one of the most hotly debated international wildlife management topics. A study was conducted to determine the public approval of commercial whaling in pro-whaling countries (Japan and Norway), as compared to non-whaling countries (New Zealand, United States, Australia, and United Kingdom). They found that disapproval of hunting whales and eating their meat was markedly high in non-whaling countries, while whaling countries moderately approved, coming back to the cultural differences angle. Interestingly, the public had similar understanding of whale populations in all surveyed countries (Hamazaki & Tanno, 2001). Historical whaling was not sustainable, and only a couple species including minke whales, could be sustainably harvested moving forward (Aron et al., 2000). Whaling for food is part of the culture in Norway and Japan, as well as many coastal indigenous peoples (Aron et al., 2000). This makes creating the laws around whaling an ethical and social justice issue, not just a conservation issue. Cultural norms influence human-animal interactions, and perceptions of whaling are a prime example of anthrozoology.

"An adult and sub-adult Minke whale are dragged aboard the Nisshin Maru, a Japanese whaling vessel that is the world's only factory whaling ship. The wound that is visible on the calf's side was reportedly caused by an explosive-packed harpoon. This image was taken by Australian customs agents in 2008, under a surveillance effort to collect evidence of indiscriminate harvesting, which is contrary to Japan's claim that they are collecting the whales for the purpose of scientific research. In 2010, Australia filed a lawsuit (still ongoing in 2019) in the International Court of Justice hoping to halt Japanese whaling; this photograph will undoubtedly play a key role in that pending case" (Australian Customs and Border Protection Service, 2008)

Figure 2.3 History of Commercial Whaling

Scientific Literature Search for Research on Anthropomorphism of Cetaceans (1996 – 2016):

- "Ecotourists' beliefs and knowledge about dolphins and the development of cetacean ecotourism" Verna Amante-Helweg, *Aquatic Mammals*, (1996)
- "Human peak experience triggered by encounters with cetaceans" Ryan DeMares, *Anthrozoös*, (2000)
- "Cetacean performance and tourism in Kaikoura, New Zealand" *Environment and Planning,* (2005)
- "Dolphins in popular literature and media" John Fraser, et al., *Society & Animals*, (2006)
- "The predicament of nature: Keiko the whale and the cultural politics of whaling in Iceland" Anne Brydon, *Anthropological Quarterly*, (2006)
- "Thinking about dolphins thinking" John Fraser et al., *Wildlife Conservation Society,* (2006)
- "I just thought that they were just frolicking": anthropomorphism and learning during guided wildlife tours" Jonathan Spring, *Tourism and Global Change: On the Edge of Something Big,* (2013)
- "Survivorship pattern inaccuracies and inappropriate anthropomorphism in scholarly pursuits of killer whale (*Orcinus orca*) life history: a response to Franks et al." Todd R. Robeck, et al., *Journal of Mammalogy*, (2016)
- "Personality in Captive Killer Whales (*Orcinus orca*): A Rating Approach Based on the Five-Factor Model" Yulan Ubeda et al., *Journal of Comparative Psychology* (2018)
- "Why brains are not computers, why behaviorism is not Satanism, and why dolphins are not aquatic apes" Louise Barrett, *The Behavior Analyst*, (2016)

This search was not exhaustive, but it shows the range of research. There were several studies on ecotourism and how it influences people's perceptions of whales, as well as the impacts of cetacean performance in marine parks on visitor's perception of the whales. Similarly, recognitions of whale and dolphin personalities in captivity were studied, as well as cetacean portrayal in popular literature and media. While the research varied, the one thing they all had in common was that they found people will anthropomorphize cetacean behavior when given a chance to interact with or observe them.

Search for Anthropomorphism of Cetaceans in News Media (2006 – 2019)

- "Brainy whales get emotional" Andy Coghlan, *NewScientist*, (2006)
- "Whales in love: Like humans, their brains are wired for romance" Renee Knight, *Independent*, (2006)
- "The cultural life of whales" Philip Hoare and Hal Whitehead, *The Guardian*, (2011)
- "Whales Mourn Their Dead, Just Like Us: Seven species of the marine mammals have been seen clinging to the dead body of a likely friend or relative, a new study says" Traci Watson, *National Geographic* (2016)
- "The Power of Compassion: why humpback whales rescue seals and why volunteering for beach cleanups improves your health" Elin Kelsey, *Hakai Magazine*, (2017)
- "Whales and dolphins have rich 'human-like' cultures and societies" University of Manchester, *Science Daily*, (2017)
- "A killer whale gives a raspberry and says 'hello'" Susan Milius, *ScienceNews*, (2018)
- "Cliquey Adriatic Dolphins May Have Strategies for Avoiding Each Other: You can't swim with us" Brigit Katz, *Smithsonian SmartNews,* (2018)
- "Lonely Dolphin Learns To Speak Porpoise For His Friends" Naia Carlos, *Nature World News*, (2018)
- "These dolphins enjoy watching *SpongeBob SquarePants*—and it could be good for them" Sofie Bates, *Science*, (2018)
- "These Whales Are Serenaders of the Seas. It's Quite a Racket: Why do whales sing? Scientists still aren't certain, and maybe the whales aren't, either" Karen Weintraub, *The New York Times*, (2019)

Rather than focusing on how anthropomorphism sneaks into science or can affect it, as the peer-reviewed research did, the news articles about whales and dolphins are blatantly anthropomorphic in their titles. They have names like "cliquey dolphins," "these dolphins enjoy watching *SpongeBob SquarePants,*" and "brainy whales get emotional" suggesting that their contents are about how cetaceans are like humans, not how humans are anthropomorphizing

cetaceans. This is a subtle but important difference between scientific literature and popular news media, especially because the news can reinforce social stereotypes about cetaceans and their behavior (Fraser et al., 2006).

2.6 Chapter Summary

Anthropomorphism is intertwined with the evolution of modern humans. As far as scientists know, it originated with homosapiens when they began to anticipate animal behaviors and adapted their hunting strategizes accordingly. Anthropomorphism is present in cave art, totem poles, ancient statues and fables. It has interfered with objective science, is pervasive throughout mascots and in marketing, and is recognized as a useful tool in conservation science. Anthropomorphism is the opposite of zoomorphism (the application of animal characteristics) and can be accidental or intentional.

While anything can be anthropomorphized, most anthropomorphism (whether subconscious or not) is directed toward animals. The more characteristics an animal shares with a human, (i.e. prosocial, cares for young, intelligence, etc.) the more humans will anthropomorphize it. This connection creates empathy, which is what conservationists can use to their advantage. Charismatic and sublime megafauna are anthropomorphized more than other species, and are often used as flagship species in conservation outreach and marketing because they invoke more empathy in the public than other species. While a powerful tool, conservationists should use anthropomorphism with caution because it can also lead to misconceptions of wildlife, and leave out vitally important but not charismatic species.

The remainder of this thesis is a case study on how anthropomorphism inspired immediate conservation action for southern resident killer whales. Key takeaways from this chapter to remember for the case study are:

1. Anthropomorphism of animals creates empathy, promoting conservation considerate behavior
2. The more charismatic and similar to humans a species is, the more it is anthropomorphized and empathized with
3. Cetaceans are often anthropomorphized, especially dolphins, who are often flagship species

4. Whales and dolphins are represented in the media as having culture, emotions, and behaviors similar to humans

Part II: Case Study

Part II of this thesis introduces the reader to Southern Resident Killer Whales and the history of their status in the Salish Sea with threats and subsequent conservation action. The case study itself focuses on J-35, Tahlequah. In 2018 her calf died and she carried it for 16 days at the detriment to her own health. The case looks at how anthropomorphism of the situation (fueled by a global news frenzy) influenced immediate conservation action.

J-16, Slick, with her calf, J-50, Scarlet. Credit: NOAA Fisheries

Chapter 3: Southern Resident Killer Whales in the Salish Sea

Killer whales are valuable to Washington's tourist economy, fueling the drive for whale watching in the San Juan Islands and representing the beauty and remaining wilderness of the Pacific Northwest. Prior to that though, killer whales were important to the Native American tribes of the Northwest coast of North America. They are considered a symbol of power and strength, and some tribes, such as the Tlingit, never hunted orcas although they hunted other whales, because orcas are considered protectors of humankind. The Kwakiutl tribe believed that the souls of marine hunters turned into killer whales (Native Languages of the Americas website, 2015). Killer whales are also the clan animal in some Native American cultures, such as the Tlingit, Tsimshian, and Kwakuitl tribes, and can be found carved on other tribes' totem poles (Native Languages of the Americas website, 2015). Despite their importance to indigenous people and PNW locals, Southern Resident Killer Whales (SRKW) are endangered and struggling for survival in the Salish Sea. To provide the background for the case study, this chapter will present the natural history of SRKW, threats to their survival, and previous conservation efforts.

3.1 Natural History

Killer whales (*orcinus orca*) are also known as orcas, and sometimes as blackfish. Most scientists use the term killer whale, while the public tends to use orca. The name killer whale came from the Spanish whaler's term "whale killer" because they observed orcas hunting other species of whales (Center for Whale Research, 2019). Despite their name, killer whales are not actually whales. They are the largest of the Delphinidae family (oceanic dolphins), with males growing up to 26 feet long and females 23 feet long. They are found in all global oceans with several distinct ecotypes, each with their own hunting strategies and preferred prey (NOAA Fisheries, 2019). Both the resident and transient (also known as Biggs's killer whales) ecotypes live in the Salish Sea, but transients prey on other marine mammals, and are doing much better than the salmon-eating residents. The specifics of why transients are out-surviving residents will be discussed in the threats portion of this chapter. The Southern Resident Killer Whales (SRKW) are broken into three family groups, J, K, and L pods, and are matriarchal with complex hierarchies.

Today, each individual whale is documented, along with his or her familial lines. This began in the 1970's when scientists began taking pictures and cataloging individuals based off of their saddle patches (white coloring on the back of the whale) and by their dorsal fin shapes. They gave each whale a numerical ID and nickname, for example J-2, Granny, was the oldest whale documented in J Pod, and was anywhere from eight five to one hundred and five years old when she died (Center for Whale Research, 2019). Living in the Salish Sea for almost a century, she would have witnessed the growth of the pods and the subsequent decline with capturing for marine parks and modern threats. She was seen breaching and playing with her grandchildren up until her death in 2016 (The Whale Museum, 2019). See Figure 3.1 for the photo ID's of all currently living whales. J Pod has 22 members, K pod has 18, and L pod has 35.

Figure 3.1 Photo IDs of J, K, and L Pod Whales

Credit: The Whale Museum and the Center for Whale Research

While SRKW do not migrate in the traditional sense, they feed almost exclusively on chinook salmon, and follow them throughout the year. J, K, and L pods range from southern Alaska to northern California, and are considered "urban whales" because of their critical habitat area in the Puget Sound (NOAA Fisheries, 2019). See Figure 3.2 for a map of the SRKW habitat range. Because of their proximity to the densely populated WA coast, SRKW are the most researched and documented whales on the planet. And yet, they are also the only endangered population of killer whales globally. This is for a number of reasons that will be discussed in the threats portion of this chapter.

Figure 3.2 Southern Resident Killer Whale Habitat Range

Credit: Earth Touch News Network created this map from NOAA satellite tagging data

Orcas are slow reproducers. Although mating and calving take place year-round, gestation can take up to 18 months, and the average female gives birth every five years. A typical female will have 3 – 5 calves on average during her lifetime (Center for Whale Research, 2019). Similarly to humans, female orcas hit puberty around thirteen to fourteen years old, and go

through menopause in their forties (Brent et al., 2015). Rather than lose status when no longer reproductively viable, older females lead the pods and teach young whales hunting strategies (Brent et al., 2015). and will often mate with the young males that are technically of age, but are not wanted by the reproducing females because they are too young. Male killer whales do not usually mate until after the age of 20, and mate with whales from other pods before returning to their mothers (Center for Whale Research, 2019). When calves are born other immediate members of the family will help care for them. Aunts will watch the calf while the mother hunts, as will young males in the pod. Other members of the pod will also help the mother by bringing her food if she's struggling.

Orcas do not just help out mothers in their pods, they often take bring food to any whale who has fallen behind or is sick. One special example is what an underwater photographer, Rainier Schimpf, and his wife, Silke Schimpf witnessed off the coast of South Africa in 2013. A young orca was missing his dorsal fin and pectoral fin, making it difficult for him to swim or hunt. He kept falling behind the pod, but rather than leave him behind (which would seem to be to the benefit of the pod) they would share their catch with him so that he did not starve. The couple returned four years later and saw that the disabled young whale had grown up and was an active member of the pod (Barcroft Animal News, 2017).

These complex social behaviors are not shocking given the intelligence of killer whales. Orca brains are four times the size of human brains, and while that may seem obvious because they are much larger physically than humans, it does not hold true for all large animals (Marino et al., 2004). For example, the stegosaurus was about the same size as an orca, and their brains were the size of a walnut. If adjusted to body ratio, human brains are slightly larger than killer whale brains, but then again, hummingbirds have a bigger brain to body ratio than both humans and killer whales (Center for Whale Research, 2009). Another measurement shows that killer whale brains have a larger surface to volume ratio than humans, meaning the part of their brain that integrates information is bigger than humans (Crawford, 2013). They also have more spindle cells, a special type of cell that has only previously been discovered in humans, great apes, humpback whales, bottlenose dolphins, and elephants, and is associated with deep emotions and bonds. Other findings show the portion of killer whale brains that deal with language are incredibly similar to humans, while the part that deals with emotions is 3x larger in killer whales and far more complex than in humans (Crawford, 2013).

To sum up this section, Southern Resident Killer Whales are highly social, highly intelligent, top marine predators living in the Salish Sea, and have been studied extensively since the 1970's. Many articles written about them are littered with anthropomorphic language, including this thesis. It is difficult not to anthropomorphize orcas given their intelligence and apparent culture. However, it may also be naïve of humans to assume that orcas do not have their own complex emotions and lives, and that people are merely projecting their thoughts and feelings onto them. This conflict will be explored more in the case study of J-35, Tahlequah, and her behavior after the death of her newborn calf.

3.2 Threats to Survival

Southern Resident Killer Whales are the only endangered population of killer whales in the world, and it is for a number of reasons. The biggest issue they face is a lack of prey. SRKW feed exclusively on chinook salmon (*Oncorhynchus tshawytscha*), a species whose populations are endangered and threatened throughout the Pacific Northwest (National Wildlife Federation, 2019). Without enough to eat, SRKW begin to metabolize their fat stores, which can be deadly because of the lipid-soluble organochlorines (DDT, PCBs, PCDDs, etc.) they contain from the polluted Puget Sound Waters and bioaccumulation up the food chain (National Marine Fisheries Service, 2008). As urban whales, SRKW deal not only with toxin pollution, but also with noise pollution from ships and boaters. Perhaps all of the above threats could be managed if the pods were at a healthy population size to begin with, but they have never recovered from the decimation of their population by hunting and the 1960's round-up for marine parks (National Marine Fisheries Service, 2008). Slow reproducers to begin with, the low birthing rates of the last 20 years and low survival of calves has further endangered the SRKW population, almost to the point of no return. Table 3.1 is from the 2008 NOAA Recovery Plan for Killer Whales, and lists the threats to SRKW, their severity, and the likelihood of mitigating them. Each of these topics could make up a thesis in their own right, so they are just mentioned here as the relevant threats to SRKW survival. Many resources are available online for further exploration of each threat.

Table 3.1 Threats to Southern Resident Killer Whales

Credit: National Marine Fisheries Service, 2008

Threat	Listing Factors	Severity	Likelihood	Feasibility of Mitigation
Prey availability	Habitat	High	High	High, many salmon recovery efforts underway
Contaminants	Habitat, Inadequacy of Existing Regulations	High	High	Medium, Puget Sound clean-up efforts underway
Vessel effects (commercial, recreational whale watch)	Habitat, Overutilization, Inadequacy of Existing Regulations	High	High	High, whale watching guidelines and outreach underway, NOAA evaluating regulations and/or protected areas
Vessel effects (other vessel traffic not targeting whales)	Habitat, Inadequacy of Existing Regulations	Medium	High	Medium, safety and security considerations may limit ability to alter shipping lanes, MMPA and ESA mechanisms in place
Sound	Habitat, Inadequacy of Existing Regulations	Medium-High	High	Medium, MMPA and ESA mechanisms in place
Oil spills (pipelines, container and oil tankers)	Other Natural or Human-made Factors	High	Low	High, regulations in place for prevention, response plan for killer whales in development
Oil spills (small chronic sources)	Other Natural or Human-made Factors	Medium	High	Medium, permits and program in place to regulate point and non-point sources
Disease	Disease and Predation	High	Low	Low, opportunistic monitoring in place
Small population size	Other Natural or Human-made Factors	Medium-High	Medium	Low, population monitoring in place
Live-captures for aquaria	Overutilization	Low	Low	Live-captures discontinued, but potential population structure effects remain

3.3 Previous Conservation Efforts

Prior to the 20th century there were estimated to be around 200 SRKW, but opportunistic shooting of pesky "blackfish" that interfered with fishing vessels, and the live capture of ~70 resident and transient whales for marine parks decimated the population down to about 75 whales. In 1972 the Marine Mammal Protection Act was passed, making it illegal to hunt, kill, harass, or capture marine mammals in the United States. In 2001, Canada listed SRKW as endangered by the Committee on the Status of Endangered Wildlife, and under the Endangered Species Act in the U.S in 2005. Although there were a couple of resurgences, overall the population continued to decline, and in 2018 Washington Governor Jay Inslee issued an executive order for the creation of the Southern Resident Orca Task Force to develop a long-term plan for SRKW recovery. Figure 3.3 was created to show the threats, conservation efforts, and the SRKW population status over time.

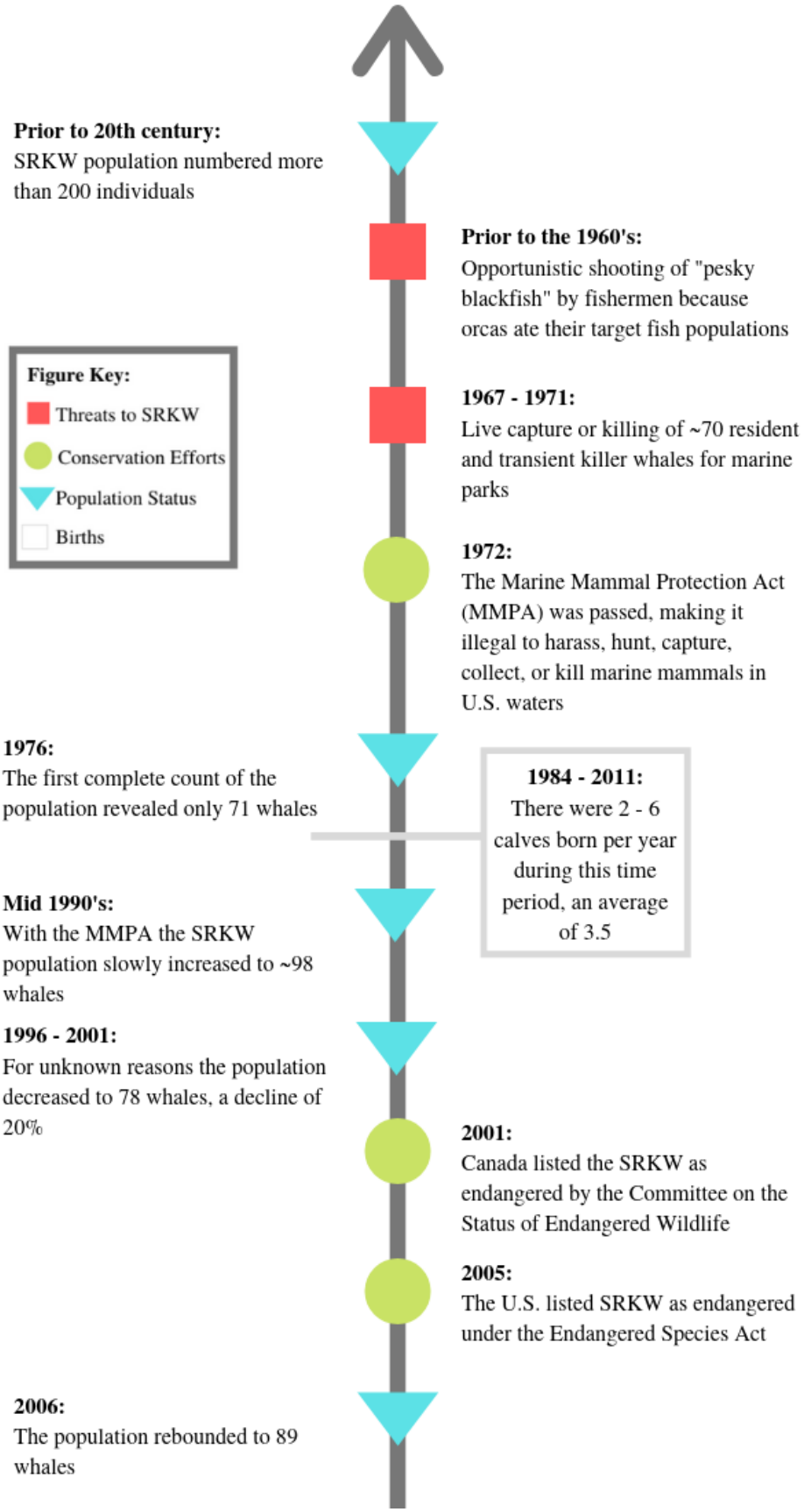
Figure Key:
Threats to SRKW
Conservation Efforts
Population Status
Births
Prior to 20th century:
SRKW population numbered more than 200 individuals
Prior to the 1960's:
Opportunistic shooting of "pesky blackfish" by fishermen because orcas ate their target fish populations
1967 - 1971:
Live capture or killing of ~70 resident and transient killer whales for marine parks
1972:
The Marine Mammal Protection Act (MMPA) was passed, making it illegal to harass, hunt, capture, collect, or kill marine mammals in U.S. waters
1976:
The first complete count of the population revealed only 71 whales
1984 - 2011:
There were 2 - 6 calves born per year during this time period, an average of 3.5
Mid 1990's:
With the MMPA the SRKW population slowly increased to ~98 whales
1996 - 2001:
For unknown reasons the population decreased to 78 whales, a decline of 20%
2001:
Canada listed the SRKW as endangered by the Committee on the Status of Endangered Wildlife
2005:
The U.S. listed SRKW as endangered under the Endangered Species Act
2006:
The population rebounded to 89 whales

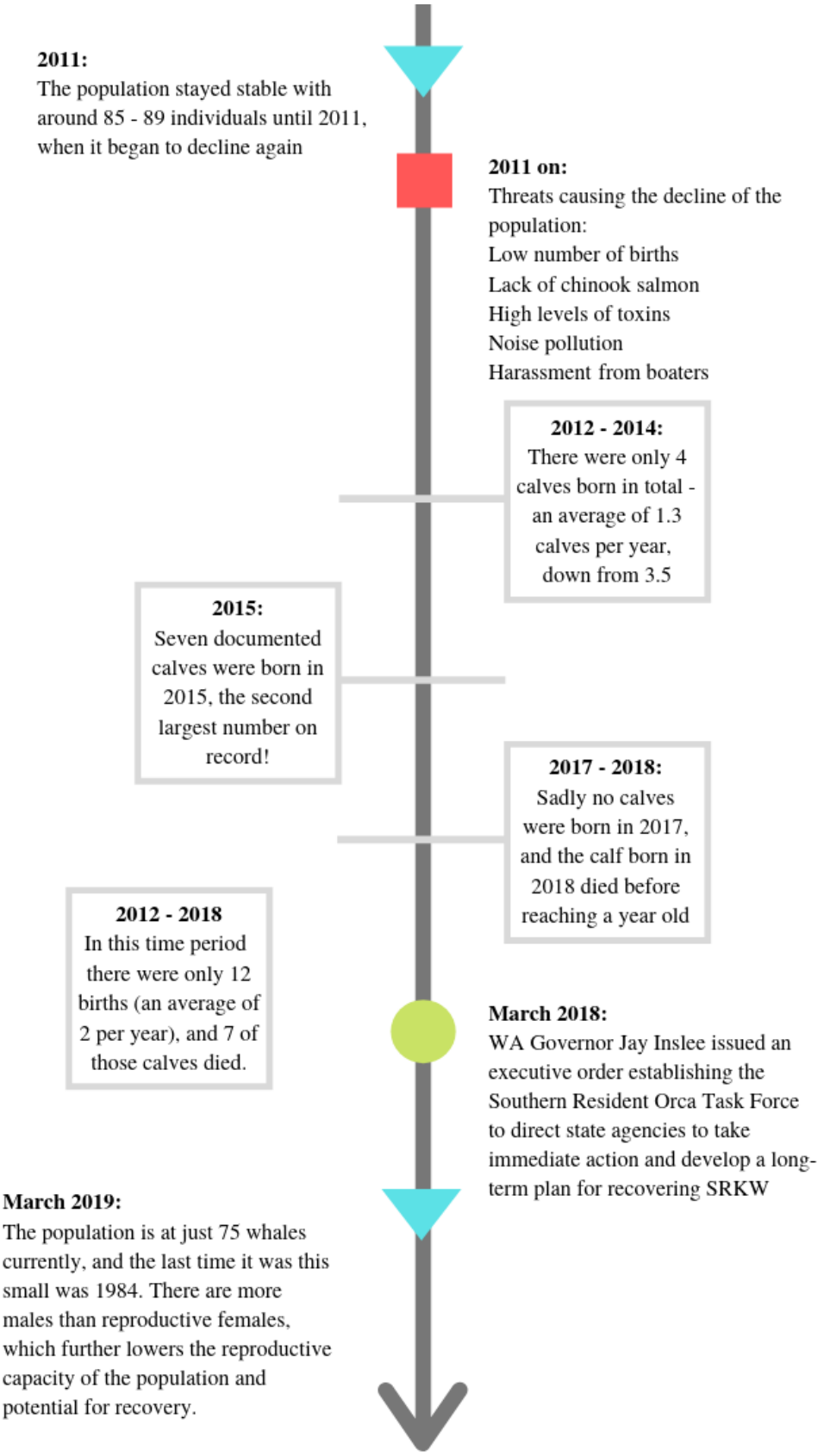

Figure 3.3 Southern Resident Killer Whale Status Timeline

Credit: Information for this graphic was found on the Marine Mammal Commission website and the website for WA Governor Jay Inslee

3.4 Chapter Summary

Southern Resident Killer Whales are icons of the Pacific Northwest with value both as a cultural symbol for Native Americans and Seattleites, and more importantly as top predators of the Salish Sea. Over the last century and a half they have gone from being feared to pests to loved, but human actions have decimated their population, almost to no return. J, K, and L pod combined only have 75 whales, and fewer births/lower calf survival rates than before. Whaling, removal of orcas for marine parks, lack of food, loss of habitat, pollutants, and noise harassment all lowered the population and prevent it from rebounding. SRKW are listed under the Endangered Species Act, and the Marine Mammal Protection Act, and recently WA Governor Jay Inslee issued an Executive Order for immediate action to recover their population.

Orcas are highly intelligent, social animals with culture and hierarchies. Their lives are similar to humans in that they go through puberty in their early teens and females go through menopause in their forties. They reproduce slowly, and spend a lot of time caring for calves and relatives. Studies have shown that killer whale brains are second only to humans when it comes to brains size relative to body size, and the portion of their brans that manages is emotions is more complex and larger than that of humans. They also have spindle cells, which have been previously only been found in humans and great apes, and are thought to be involved in the creation of emotions. This suggests that killer whales may have emotions and relationships similar to humans.

Key Takeaways:

1. Killer whales are highly intelligent and social, and may have emotions similar to humans
2. Southern Resident Killer Whales (SRKW) are broken into matrilineal pods, J, K, and L
3. Extremely endangered
4. Biggest threats are lack of prey (chinook salmon) and high levels of pollutants

Chapter 4: The story of Tahlequah (J-35) and her calf

This chapter presents the case study of SRKW, J-35, Tahlequah, and how her grief touched people's hearts around the globe.

4.1 Who is Tahlequah and What Happened?

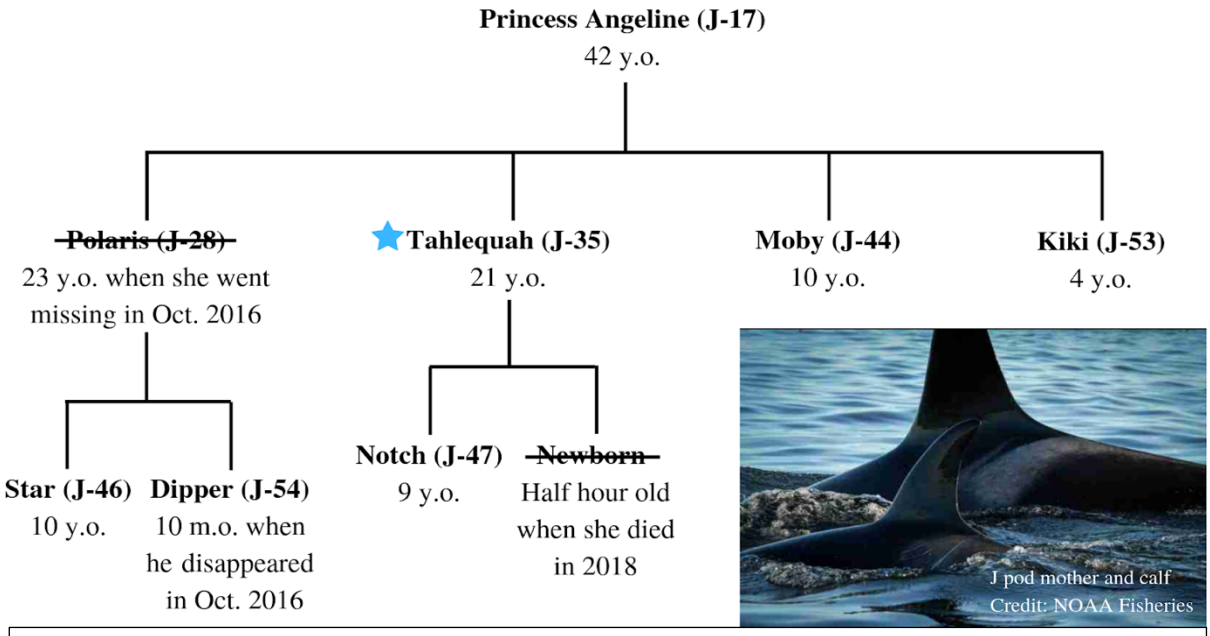

Figure 4.1 Tahlequah's Family Tree
Information for this graphic was found on The Whale Museum and Center for Whale Research websites.

Tahlequah, the whale who grieved for the whole world to see, is a 21-year-old member of J pod, also known as J-35. Figure 4.1 shows her lineage, based on the visual identification system developed in the eighties. She is the second calf of four born to Princess Angeline (J-17), with three surviving today. Tahlequah is mother to Notch (J-47), who is only slightly younger than his cousin, Star (J-46), and is quite close with, according to observers. Tahlequah took over care for Star after her mother, Polaris (J-28), Tahlequah's sister, disappeared in October 2016 with her young calf, Dipper (J-54), and was assumed dead. This kind of supportive care by relatives has been seen repeatedly in resident killer whale behavior, both northern and southern (Mann et al., 2000). Researchers describe Tahlequah as an attentive mother to Notch, and were very excited to see her pregnant again in 2017, as there are few reproductive females left in J, K,

and L pods. She gave birth to a female calf near Victoria, British Columbia on July 24, 2018, and they swam together for a short time. Sadly, the calf was severely emaciated, and lacked enough blubber to stay afloat. She died after only 30 minutes of life in the Salish Sea (Center for Whale Research, 2018). Tahlequah kept pushing her calf to the choppy surface even after she stopped breathing, until the sun went down. A San Juan Island local watched the whole thing, and said:

> "At sunset, a group of 5-6 females gathered at the mouth of the cove in a close, tight-knit circle, staying at the surface in a harmonious circular motion for nearly 2 hours. As the light dimmed, I was able to watch them continue what seemed to be a ritual or ceremony. They stayed directly centered in the moonbeam, even as it moved. The lighting was too dim to see if the baby was still being kept afloat. It was both sad and special to witness this behavior. My heart goes out to J35 and her beautiful baby; bless it's soul"
> (Center for Whale Research, 2018).

The researchers and residents who watched the sad event were just the first to share in Tahlequah's grief. Killer whales are known to carry their deceased calves for a few days in their grief, just as elephants and gorillas mourn their dead (Mann et al., 2000). But Tahlequah shattered those standards by carrying her dead newborn far longer than ever before. See Figure 4.2 for images of her doing so. Local news outlets started covering her vigil after 5 days, and the news spread quickly around the world as she continued into her 7th, 10th, 15th day...until after over a thousand miles and 17 days she finally released her decaying baby to sink to the seafloor on August 11th. She fell behind the pod more than once during her "tour of grief," and researchers worried she would starve herself to death - losing a reproductive female would be a true blow to the struggling population. But her relatives took turns bringing her fish and she always caught up eventually, toting her heavy baby with her despite the cost to her health. Researchers are unsure whether she eventually let go of her calf because she wanted to or if it was because she was decomposing. No matter the case, Tahlequah inspired an outpouring of empathy, grief, and outrage around the world, and opened the public's eyes to the plight of

Southern Resident Killer Whales unlike any has done before. In the next section of this thesis, articles telling her story will be analyzed for their variations of anthropomorphic language.

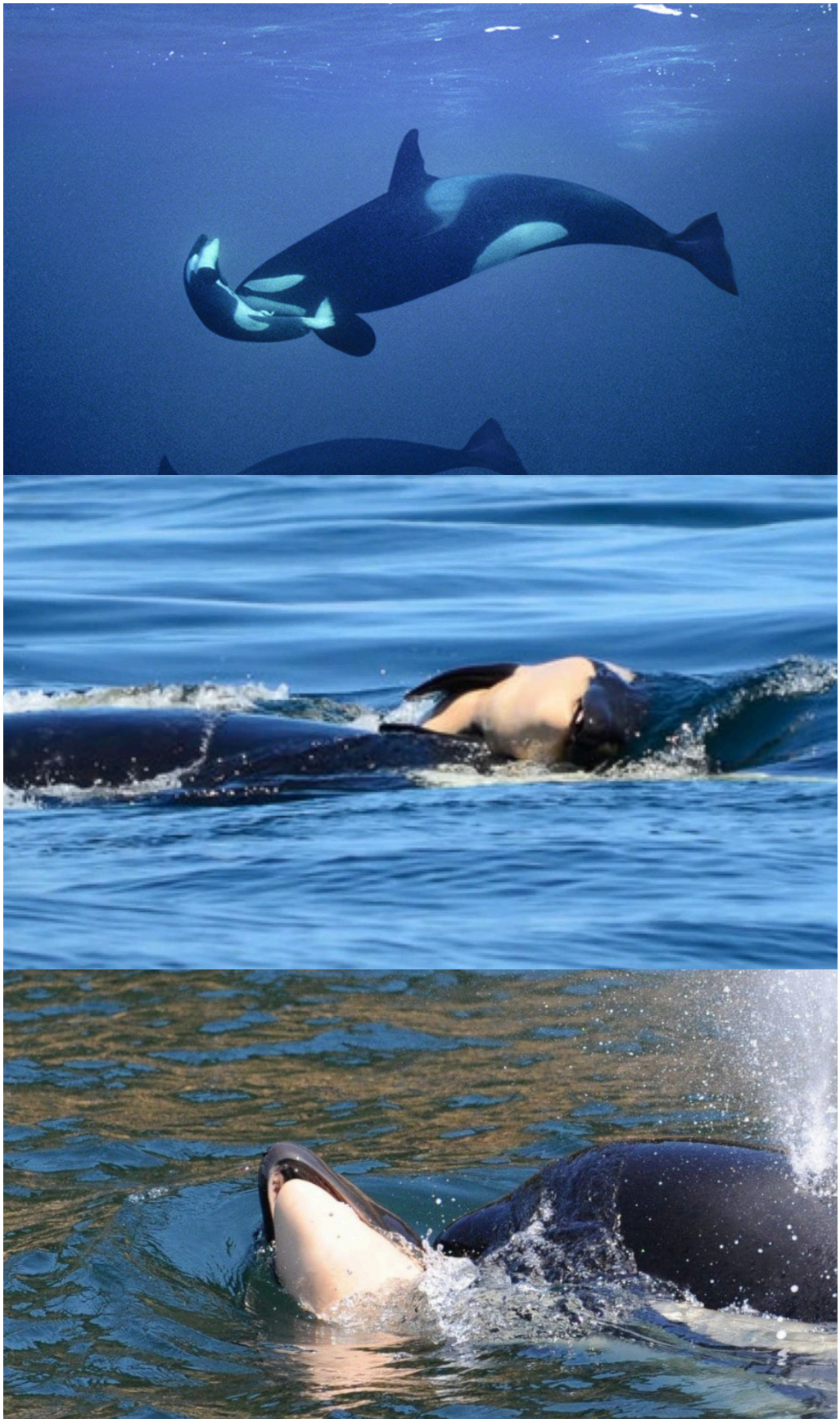

Figure 4.2 Images of Tahlequah Carrying her Deceased Calf These images are from the Center for Whale Research, Soundwatch under a NMFS MMPA permit, and Ken Balcomb/Center for Whale Research, respectively.

4.2 "Tahlequah's Tour of Grief" - Anthropomorphism of Her Loss in News Media

When dealing with highly intelligent, social animals with brains 4x larger than humans, it becomes difficult to draw the line between anthropomorphic language about their behaviors and descriptions of behaviors that are their own but that they share with humans. For example, great apes play with their young, elephants grieve their dead, and killer whales certainly have a hierarchical society, all of which are natural and also human behaviors. The issue is that these behavioral similarities between nonhuman animals and humans can lead to blatant anthropomorphism. For example, there is no evidence or observations of religion in cetaceans (or other nonhuman animals for that matter) so to say that a dolphin is praying would be anthropomorphism, while saying it is playing is not.

Emotions are much trickier to prove. Many scientists maintain that animal behaviors that look like emotions are merely "affect," or behaviors that seem like emotion but are really just a biological response to a stimulus. This is mostly said in labs, where scientists need to maintain strict control over anthropomorphism to protect their experiments from bias, and also to keep distance from their subjects in order to prevent empathy. Empathy for a monkey systematically being tested on in ways that are arguably inhumane or immoral, would take a psychological toll on the scientist performing the experiment.

However, humans have decided they have emotions, so why is it wrong to assume other intelligent, social animals with spindle cells (the source of emotion in the human brain limbic system) have emotions and reactions in common with humans? In this author's opinion, it is not wrong to make that assumption. In order to have some consistency in an anthropomorphic framework of cetacean behaviors however, a standardizing agent is needed. For this thesis, a framework was developed based on scientific evidence. While there are many phenomena science has yet to prove, existing evidence was used to categorize behaviors shared between cetaceans and humans as natural, speculated, or anthropomorphized. It is worth noting that the completely undocumented behaviors in the table are also the most complex behaviors that humans do not entirely understand about themselves. In fact, it could be said that humans anthropomorphize animals or examine anthrozoological relationships to better understand themselves. Trying to prove these behaviors in other intelligent animals can be a way to understand human motivations and sense of self.

Keeping all of this in mind, Table 4.1 was created to provide a scientifically-based framework organizing cetacean behaviors into natural, speculated to be natural but may instead be anthropomorphism, and behaviors that are blatantly anthropomorphized. This framework will be used to analyze the news articles surrounding Tahlequah's "tour of grief." Each behavior that is backed by scientific evidence has more than one study done on it, with an example study for each listed under the table.

Table 4.1

Shared Behaviors Between Humans and Cetaceans

Evidence-based Behaviors (natural)	Speculated Behaviors (both)	Undocumented Behaviors (human)
Social Behaviors (1)	Love (7)	Religion
Culture (2)	Annoyance (8)	Artistic Expression
Playing (3)	Empathy (9)	Future Planning
Grieving (4)	Anger (10)	Dreaming
Self-Awareness (5)	Vengeance (11)	
Altruism (6)		

↑ ↑

- Anthropomorphism +

(1) "Cetacean Societies: Field Studies of Dolphins and Whales" Mann et al. (2000)
(2) "Culture in Whales and Dolphins" Rendell & Whitehead (2001)
(3) "Play in Wild and Captive Cetaceans" Paulos et al. (2010)
(4) "Cetacean Behavior Toward the Dead and Dying" Bearzi et al. (2017)
(5) "Mirror Self-Recognition in the Bottlenose Dolphin: A Case of Cognitive Convergence" Reiss & Marino (2001)
(6) "Cetacean Societies: Field Studies of Dolphins and Whales" Mann et al. (2000)
(7) "Why Do Dolphins Smile? A Comparative Perspective on Dolphin Emotions and Emotional Expressions" Kuczaj et al. (2012)
(8) "Why Do Dolphins Smile? A Comparative Perspective on Dolphin Emotions and Emotional Expressions" Kuczaj et al. (2012)
(9) "Are Animals Capable of Deception or Empathy? Implications for Animal Consciousness and Animal Welfare" Kuczaj et al. (2001)
(10) "Why Do Dolphins Smile? A Comparative Perspective on Dolphin Emotions and Emotional Expressions" Kuczaj et al. (2012)
(11) "Humpback whales interfering when mammal−eating killer whales attack other species: Mobbing behavior and interspecific altruism?" Pitman et al. (2017)

News articles about Tahlequah and her dead calf in chronological order:

"An orca calf died shortly after being born. Her grieving mother has carried her body for days"
The Washington Post
July 27, 2018

"For roughly 17 months, she patiently waited. Like many expectant mothers, she looked forward to the day she would get to welcome her baby into the world.

On Tuesday morning, it finally happened. J35, a member of an endangered population of southern resident killer whales, gave birth near Victoria, B.C. It was a baby girl. She was the first calf to be born alive in three years to the pod known to frequent the waters off the coast of Washington state. In that moment, surrounded by family and swimming by her mother's side, everything was perfect.

Then, the calf stopped moving, and J35 experienced a mother's worst horror. She watched her baby die — less than an hour after giving birth to her.

But J35 wasn't ready to say goodbye.

"It's real, and it's raw," Giles said. "It's obvious what's happening. You cannot interpret it any other way. This is an animal that is grieving for its dead baby, and she doesn't want to let it go. She's not ready."

This reaction is similar to how many people feel when they lose a child, Giles said. "That's part of what people are picking up on, like 'My God, I would feel the same way,' " she said. " 'If I had a baby that only took a couple breaths, I wouldn't want to let it go, either.' "

"The Orca, her Dead Calf, and Us"
New York Times (opinion)
August 4, 2018

> "At times, interpreting their behavior through a human lens might be misleading, silly or even harmful. But at other times - and they occur more often than science would care to admit - perceiving ourselves in these others is exactly the right response. When an animal's emotional state is obvious to anyone with eyes and a heart.
>
> Like the human brain, the orca brain contains von Economo neurons: rare, specialized cells that relate to empathy, communication, intuition and social intelligence.
>
> So orcas feel emotions, however exotically, which in turn strikes an emotional chord in us. Yes, they're smart, but our fascination with orcas and other cetaceans also stems from something more esoteric. On some level, we sense how connected we are. As with anthropomorphism, science balks at the notion that these animals affect us so profoundly because of some innate kinship — but that doesn't make us feel it any less"

"I have not slept in days': Readers react to Tahlequah, the mother orca clinging to her dead calf"
Seattle Times
August 5, 2018

> "We asked you how this story was affecting you and what questions you had about orcas in the Puget Sound. More than 1,000 readers responded, flooding our comment sections and inboxes with tales of how Tahlequah's story has impacted them. Some shared poems, others shared art and one group shared a killer-whale ballet. But the common theme among the responses was profound grief over this mother whale, her dead calf and the state of our southern resident killer whales.

> "I can't stop crying. I can't sleep," wrote Enza Amendola. "My heart is aching and I am powerless to help."
>
> Some readers empathized deeply with the mother whale, responding with stories of their own grief and loss, while others saw a silver lining in the spotlight the story has shined on the bigger, more dire issues facing the southern residents."

"A mother orca's "tour of grief" reminds us how much we have in common with animals"
Quartz
August 6, 2018

> The pair's journey has been described by observers and orca researchers as a "tour of grief." That's because the obvious bond between mother and child orca–what's known as "nurturant behavior" towards a dead calf–reminds us of our own human mother-child instincts. To see J35 grieving her dead child is to imagine ourselves going through the same process; hence the global outpouring of empathy for the whale. And on a fundamental level, the orca's evident bond with her child reminds us of how much we have in common with other animals.
>
> "To learn the orcas' natural and cultural history is to understand how closely connected a mother and calf are, how tight-knit their bond." Mother orcas have a unique bond with their offspring, who rarely leave their mothers' sides. That bond is heartbreakingly evident in cases that involve death. A 2012 study found that the death of a mother orca meant an eightfold increase in the likelihood of death within a year for males over the age of 30. And we know that killer whales grieve their dead: A 2016 study collected evidence of 14 instances of adults displaying care and affection toward dead calves, across seven species, in seven different geographic regions.

> While that aspect of the orcas' mother-child bond is unique, killer whales also share some things in common with humans. For example, mother orcas tend to cradle their newborns on the left, like humans do. That's because the position activates the right hemisphere of the brain, which controls communication and bonding functions."

"'I am sobbing': Mother orca still carrying her dead calf — 16 days later"
The Seattle Times
August 8, 2018

> "I am sobbing. I can't believe she is still carrying her calf around," Giles said, adding, "I am gravely concerned for the health and mental well being of J35.
>
> The plight of Tahlequah carrying her dead baby for hundreds of miles, refusing to let it go, has struck the hearts of people around the world.
>
> Tahlequah's witness to her loss, as she carries her dead calf day after day through the Salish Sea, is searing."

"Orca mother carries dead calf for 17th day as it's 'starting to come apart'"
Q13 Fox News
August 9, 2018

> "An orca mother continues to hold on to her dead calf, even as its carcass decomposes on top of her. Balcomb speculates J35 will drop her baby soon, after carrying it for more than 1,000 miles. He called the latest updates "macabre."

"Grieving mother orca finally lets go of dead calf after 17 days"
CBS News
August 12, 2018

> “The mother carried the baby on her head for at least 17 days, in an image of grief that struck an emotional chord worldwide.
>
> "She literally is pushing her baby to connect with it and, hope against hope -- hoping that it will take a breath, which it will never do," biologist and wildlife conservationist Jeff Corwin told CBSN last week. "I can imagine this [mourning period] could take a very, very long time."”

“Orca mother finally abandons dead calf she carried for more than two weeks”
The Guardian
August 12, 2018

> “Researchers say an endangered killer whale that carried her dead calf on her head for more than two weeks has finally abandoned the calf’s body and is back to feeding and frolicking with her pod.
>
> The whales are being deafened by sonar and boat noise in the sea, as well as a lack of Chinook salmon, their main source of food. However, with each salmon they catch, they are poisoned a little more as pollution accumulates at the top of the food pyramid.”

“'She's Clearly Reacting to a Loss': Experts Say Killer Whale Carrying Her Dead Calf for 17 Days May Actually Be Grieving”
Time Magazine
August 12, 2018

> A mother orca whale is still carrying the body of her calf 17 days after it died, in what some experts say may be an unprecedented testament to the strength of the species’ familial bonds.

Other members of the pod have even taken turns carrying its body.

"We do know that animals form very strong bonds, and killer whales are very well known to have very strong social relationships with their family members," Christen says. "[Tahlequah] is an experienced mom - she's had a calf before — so she's doing what she has a very strong instinct to do."

"These are highly intelligent, highly social animals, and they have cultures," Ross says. "They're like family units."

Tahlequah's past and present behavior illustrates that fact. Two years ago, Christen remembers, Tahlequah's sister died and left behind a nursing calf. Tahlequah "adopted" the calf and tried to care for it, until the baby ultimately died without its mother, Christen says.

Those incredible acts have led many observers to assign human emotions to Tahlequah - a natural tendency, Ross says. "One of the reasons the story is rather heart-wrenching is the fact that we've grown to truly marvel at this iconic species and I think we see a little bit of us in them," Ross says. "We look for things that we might understand or explain on the basis of our own experiences."

"Orca Mother Drops Calf, After Unprecedented 17 Days of Mourning"
National Geographic
August 13, 2018

"A Pacific Northwest orca likely bonded closely with her calf before it died, which could help explain her record-breaking

emotional sojourn.

The sad spectacle was a prime example, and confirmation, of the complex emotional lives of these sophisticated cetaceans, experts say.

As J35's sojourn continued, some experts wondered why she was so attached to the calf. Was it because the calf lived for about 30 minutes after it was born? Jenny Atkinson, executive director of The Whale Museum in Friday Harbor, British Columbia, thinks the grief Tahlequah is feeling is deeper because after 17 months of gestation, she then had the chance to form an emotional connection with her baby before it died."

What a Grieving Orca Tells Us
The Atlantic
August 14, 2018

"These whale aficionados see these whales not as generic, faceless exemplars of their species, but as individuals with families and personalities. This familiarity makes the whales' plight even harder to take.

It is hardly anthropomorphic to ascribe grief to animals that are so intelligent and intensely social. Tahlequah's relatives occasionally helped her carry her dead calf, and may have helped to feed her during her mourning.

Giles describes Tahlequah as an "incredibly attentive mother" that played with her first calf, Notch (J47), more than most orca moms. Since Notch was born in 2010, it's likely that

> Tahlequah has gone through at least one failed pregnancy, if not two. That, combined with her personality, might explain her incredible 17-day mourning period. "Think about a female going through those pregnancy hormones, growing a fetus, and then losing it—twice," says Giles. "And then finally, she has a full-term calf, and after a breath, it dies. It's not surprising that she was grieving to the degree that she was."
>
> Balcomb goes even further. "It's a little bit of anthropomorphism, but I think she was letting everyone else know she was grieving," he says. "They're very intelligent. They know people are out there: I've seen them look at boats hauling fish out in nets. I think they know that humans are somehow related to the scarcity of food. And I think they know that the scarcity of food is causing them physical distress, and also causing them to lose babies."

Discussion:

All of the articles have the same core message: people were sad for Tahlequah's loss, shocked by how long she carried her baby, worried for her, and overall, concerned for the health of Southern Resident Killer Whales. Sections of each article were provided to give a sample of the authors' takes on the story, as well as potentially anthropomorphized phrases in context. Each was highlighted when a word or phrase projected human-like qualities on Tahlequah. Table 4.2 is a collection of the anthropomorphized phrases – note that some are verbs describing Tahlequah's behavior, while others are comments on her emotional state.

Table 4.2

Anthropomorphic Language in Articles About Tahlequah

Wasn't ready to say goodbye	Making a statement	Emotional connection	Witness to her loss
Grieving her dead child	Emotional sojourn	Mother-child bond	Daughter
Looking forward to	Mourning	Frolicking	Horror
Patiently	Adopted	Hoping	Sorrow

Some of the articles held blatantly anthropomorphic statements such as Tahlequah was "looking forward to the birth of her calf," or carrying her dead calf to "make a statement" about human degradation to their habitat. Others used anthropocentric words such as "child" or "daughter," which are not used when referring to other species. One does not often hear about a mother lion and her child (instead of cub), or a seal and her daughter (instead of pup). Still other words such as "sorrow" and "horror" were more in the middle of the range of natural to anthropomorphic, meaning they can probably be attributed to such an intelligent mammal, but have not yet been scientifically proven. Finally, words such as "grief" and "emotional connection" were not considered anthropomorphic because although humans show these behaviors, killer whales do as well, so it is not just projecting human characteristics onto another species. Some of the authors mentioned anthropomorphism in their articles, some said it was not anthropomorphism because the whales are perfectly capable of grief, while others just let their words stand without apology.

As discussed earlier in this thesis, anthropomorphism is not just apparent in the casting of human behaviors onto animals. It also invokes empathy – something the media surrounding Tahlequah's 'tour of grief' was full of. The following quotes are found in the articles above, but paraphrasing them does not do them justice so they have been re-listed here to show the impact of Tahlequah's story on both Puget Sound residents and people from around the world:

> "This reaction is similar to how many people feel when they lose a child, Giles, a conservation biologist, said. "That's part of what people are picking up on, like 'My God, I would feel the same way,' " she said. " 'If I had a baby that only took a couple breaths, I wouldn't want to let it go, either.' " (The Washington Post, 7/27/18)

> "More than 1,000 readers responded, flooding our comment sections and inboxes with tales of how Tahlequah's story has impacted them. Some shared poems, others shared art and one group shared a killer-whale ballet. But the common theme among the responses was profound grief over this mother whale, her dead calf and the state of our southern resident killer whales.

> Some readers empathized deeply with the mother whale, responding with stories of their own grief and loss, while others saw a silver lining in the spotlight the story has shined on the bigger, more dire issues facing the southern residents" (Seattle Times, 8/5/18)
>
> "I can't stop crying. I can't sleep," wrote Enza Amendola. "My heart is aching and I am powerless to help" (Seattle Times, 8/8/2018)
>
> "One of the reasons the story is rather heart-wrenching is the fact that we've grown to truly marvel at this iconic species and I think we see a little bit of us in them," Ross says. "We look for things that we might understand or explain on the basis of our own experiences" (Time Magazine, 8/12/2018)

People were so touched by Tahlequah's story that they cried, wrote poems, created art, and re-lived their own losses in response to hers. As some of the articles said, and as science has shown, killer whales are remarkably intelligent and have tight social bonds with family members and relatives, so understanding Tahlequah's grief as similar to their own was not a stretch. Observation of killer whale births in the wild have only been documented twice, and in both cases relatives gathered around the mother and breached, slapped their tails, and making percussive calls after the birth. They even rubbed and lifted the infant into the air, in what could only be described as a celebration (Baird, 2000). Despite the attentions of relatives and the mother, neonatal mortality of wild cetaceans is high; about 43% of resident killer whale calves die during their first 6 months (Baird, 2000), especially first-born calves. Of the few calves born to the SRKW each year, a high percentage dies, so why was Tahlequah's calf any different? In essence, she was not, but Tahlequah is an attentive mother to her other calf, and the length of time she carried her dead newborn caught the media's attention. The power of the public's empathetic response to Tahlequah over other SRKW calf deaths shows how much influence the media has, especially with charismatic megafauna. The next section will discuss the subsequent conservation actions taken after the news frenzy surrounding Tahlequah's tour of grief.

4.3 Direct Conservation Action Following Media Attention

Southern Resident Killer Whales have been struggling for years, and although many scientists have been sounding the alarm about their dwindling populations and non-profits such as the Center for Whale Research, Orca Conservancy, and Wild Orca work to improve their status, little has been done until recently. NOAA Fisheries listed Southern Residents as endangered in 2005, and in 2011, adapted the Marine Mammal Protection Act and Endangered Species Act so that vessels could not be within 400 yards of the path of incoming whales, and must stay at least 200 yards away from them (NOAA Fisheries, 2011). In 2015, they named SRKW as a "Species in the Spotlight," warranting intense efforts for their recovery (NOAA Fisheries, 2016). Work has also been done to improve the availability of prey for SRKW, specifically improvement of endangered salmon and steelhead stocks from the Columbia and Snake River systems (NOAA Fisheries, 2016). Despite these efforts, the SRKW population has continued to decline. More drastic measures are needed to recover SRKW.

In March 2018, WA Governor Jay Inslee issued Executive Order 18-02 creating the Southern Resident Killer Whale Recovery and Task Force. The order directed state agencies to take immediate actions to their recovery. The task force includes nearly 50 members, including state agencies, the legislature, and state, tribal, federal and local governments, as well as private sector and non-profit organizations (Jay Inslee website, 2019). The task force set a goal of increasing the SRKW population from 75 to 84 over the next decade, and will do so by increasing the abundance of chinook salmon, decreasing disturbance and risks from vessel traffic and noise, reducing exposure to toxic pollutants, and ensuring funding, information, an accountability to support the recovery efforts (Jay Inslee website, 2019). The four pages of the executive order can be viewed in Figure 4.3 below.

Only four months after Inslee issued E.O. 18-02, Tahlequah lost her calf, and the news frenzy began. While the recovery and task force plans were already in motion, the public support came pouring in from the empathetic observers of Tahlequah's tour of grief. Sadly, while Tahlequah was still carrying her newborn, another member of J-pod was also struggling to survive. Scarlet (J-50), was born in 2014 to Slick (J-16), her fourth calf. On August 2nd, 2018, researchers decided to assess the health of Scarlet because she emaciated and lethargic. They were able to take photographs of her and obtain a breath sample, which did not show any illnesses but also did not preclude them. Figure 4.4 shows her emaciated condition.

JAY INSLEE
Governor

STATE OF WASHINGTON
OFFICE OF THE GOVERNOR
P.O. Box 40002 • Olympia, Washington 98504-0002 • (360) 902-4111 • www.governor.wa.gov

EXECUTIVE ORDER 18-02

SOUTHERN RESIDENT KILLER WHALE RECOVERY AND TASK FORCE

WHEREAS, Southern Resident Killer Whales (Southern Residents) are an iconic and treasured species in Washington and throughout the Pacific Northwest;

WHEREAS, Southern Residents are classified as endangered in Washington and surrounding waters, under the U.S. Endangered Species Act and in Canada under the Species at Risk Act;

WHEREAS, the population of Southern Residents has declined, from a high of 98 in 1995, to 76 today, which is the lowest number of Southern Residents in more than three decades. Recent science also indicates that many Southern Residents are in poor condition and are struggling to raise calves;

WHEREAS, if Southern Residents were to become extinct, we would suffer an unacceptable loss to our environment, economy, and way of life. We would also lose an essential component of our marine ecosystem and an indicator of the health of our waters;

WHEREAS, Southern Residents hold significant cultural value to native tribes and all Washingtonians;

WHEREAS, Southern Residents, through the whale watching industry alone, contribute as much as $60 million to the local economy annually and provide hundreds of jobs to the Puget Sound region;

WHEREAS, Southern Residents make their home in Washington's marine waters for a portion of the year, but they are also highly migratory seeking prey along the west coast from Northern California to Southeast Alaska. Therefore, Southern Residents rely on healthy ecosystems and food sources from Washington and throughout the west coast of the United States and Canada;

WHEREAS, three primary factors threaten Southern Resident populations: (1) prey availability, (2) legacy and new toxic contaminants, and (3) disturbance from noise and vessel traffic. The health of Southern Residents and Chinook salmon are tightly linked. Recent scientific studies indicate that reduced Chinook salmon runs undermine the potential for the Southern Resident population to successfully reproduce and recover. Both Southern Residents and Chinook salmon populations are adversely impacted by warming oceans and ocean acidification due to climate change. Presence of contaminants and accumulation of pollutants in Washington's waters are also linked to the decline of Southern Residents. Key sources of contamination in storm water runoff remain to be addressed and the potential for a catastrophic oil spill continues to threaten Southern Residents and the entire ecosystem of Puget Sound. In addition, increased boat and ship traffic has caused greater underwater noise that interferes with Southern Resident critical feeding and communication;

WHEREAS, both swift near-term actions and effective long-term actions are necessary to recover these iconic and endangered animals. Essential recovery actions that are described in both United States and Canadian federal plans and federally approved regional plans must be implemented through close coordination with all of our partners including state, local, tribal, and Canadian governmental entities and other private sector partners to be successful;

NOW THEREFORE, I, Jay Inslee, Governor of the state of Washington, by virtue of the power vested in me by the Constitution and statutes of the state of Washington do hereby order and direct as follows:

Implement Immediate Actions to Benefit Southern Resident Killer Whales
Within existing resources, I ask the following state agencies, in consultation with the appropriate local governments, federal agencies, and tribal governments, to conduct the immediate actions listed below to further the purpose of this Executive Order.

- Washington Department of Fish and Wildlife (WDFW) with review from the Governor's Salmon Recovery Office (GSRO) and the Puget Sound Partnership (PSP)—By July 31, 2018, identify the highest priority areas and watersheds for Southern Resident prey in order to focus or adjust, as needed, restoration, protection, incentives, hatcheries, harvest levels, and passage policies and programs.
- WDFW and Washington State Parks and Recreation Commission (WSPRC)—By April 30, 2018, develop implementation plans for increased enforcement, outreach and education of vessel regulations as well as enforcement of Chinook fisheries regulations in areas frequented by orcas.
- Washington State Department of Ecology (Ecology)—By April 30, 2018, create a curriculum to improve and increase the number of trainings for vessels in the whale watching industry to become "vessels of opportunity" to assist in the event of an oil spill.
- Washington State Department of Transportation (WSDOT)—By May 31, 2018, develop strategies for quieting state ferries in areas most important to Southern Residents.
- WDFW—By April 30, 2018, review and amend, as needed, 2018 recreational and commercial fishing regulations prioritizing protection of key areas and fish runs for Southern Resident recovery. I will also ask our tribal co-managers, and international and federal fisheries managers to work directly with WDFW and its Commission in developing recommendations for implementing this action.
- WDFW—By April 30, 2018, explore options and develop a proposal to alter fish food used in state hatcheries to limit the amount of Polychlorinated Biphenyls (PCBs) in Southern Resident prey.
- PSP, WDFW, GSRO—By December 15, 2018, demonstrate how Chinook recovery projects benefit Southern Resident recovery, beginning in the 2018 grant round, for the Pacific Coast Salmon Recovery Fund, the Puget Sound Acquisition and Restoration Program, the Estuary and Salmon Restoration program and the Washington Coastal Restoration Initiative.
- PSP, WDFW, GSRO, WSPRC, Washington State Department of Licensing (DOL)—By July 1, 2018, prioritize existing outreach resources to support Southern Resident recovery. Collaborate with the Governor's Office to develop a public education program and identify needed resources.
- Ecology—By July 31, 2018, develop criteria to prioritize financial assistance beginning in the 2019-21 biennium for storm water projects that benefit Southern Resident recovery.

Establishment of the Southern Resident Killer Whale Task Force
A Southern Resident Killer Whale Task Force is hereby created to identify, prioritize, and support the implementation of a longer term action plan needed for the recovery of Southern Residents and necessary to secure a healthy and sustained population for the future. The plan shall include actions needed to make significant progress in addressing all three of the identified threats to Southern Residents. The Task Force should monitor and evaluate the immediate actions undertaken by state agencies and build upon the progress and effectiveness of that work when developing longer term actions. Where available and applicable, the Task Force should build upon existing state, regional and federal plans.

Members of the Task Force will include directors or their senior designees from the Washington Departments of Agriculture, Commerce, Ecology, Health, and Transportation, as well as the Puget Sound Partnership, the Governor's Office of Indian Affairs, the Recreation and Conservation Office, and the Governor's Salmon Recovery Office. I also invite the Department of Fish & Wildlife and its Commission, the Department of Natural Resources, and the Washington State Parks and Recreation Commission to participate on the Task Force as members in full.

I will separately invite representatives of appropriate federal, tribal, and local governments, the private sector and the non-profit sector, to participate in the Task Force. I will invite each Washington legislative caucus to appoint a member to participate in the Task Force.

I shall appoint co-chairs and convene the Southern Resident Killer Whale Task Force (Task Force) beginning in April 2018.

The Task Force shall work with all levels of government and other partners to identify needed policies and programs, recommend priority actions to support recovery efforts, highlight budget needs, and recommend any legislation needed to support this Executive Order. The Task Force shall coordinate their work with appropriate representatives of the Government of Canada, the Province of British Columbia, and the states of Oregon, California, Idaho, and Alaska.

The Task Force shall prepare a comprehensive report and recommendations for recovering Southern Residents, with a full draft due by October 1, 2018, and a final report by November 1, 2018. The report should detail ongoing and new actions that will address all of the major threats to Southern Residents, including prey availability, legacy and ongoing toxic contaminants, and disturbance from noise and vessel traffic. A second report outlining the progress made, lessons learned, and outstanding needs shall be completed by October 1, 2019. With the submission of its second report, the Task Force shall dissolve.

I direct the Puget Sound Partnership and ask the Department of Fish and Wildlife to organize the necessary agency experts and staff to support the work of the Task Force. The Governor's Policy Office and the Office of Financial Management will provide assistance and guidance to the lead agencies as needed to ensure the success of the Task Force.

The Governor's Office will work with both the State Legislature and State Congressional delegation to solicit their early and ongoing advice and guidance.

The Southern Resident Killer Whale Task Force shall conduct its business in an open, transparent manner, and its meetings will be open to the public.

Signed and sealed with the official seal of the state of Washington on this 14th day of March, 2018, at Olympia, Washington.

By:

/s/
Jay Inslee
Governor

BY THE GOVERNOR:

/s/
Secretary of State

Figure 4.3 Executive Order 18-02
Executive Order 18-02: Southern Resident Killer Whale Recovery and Task Force (Jay Inslee Website, 2019)

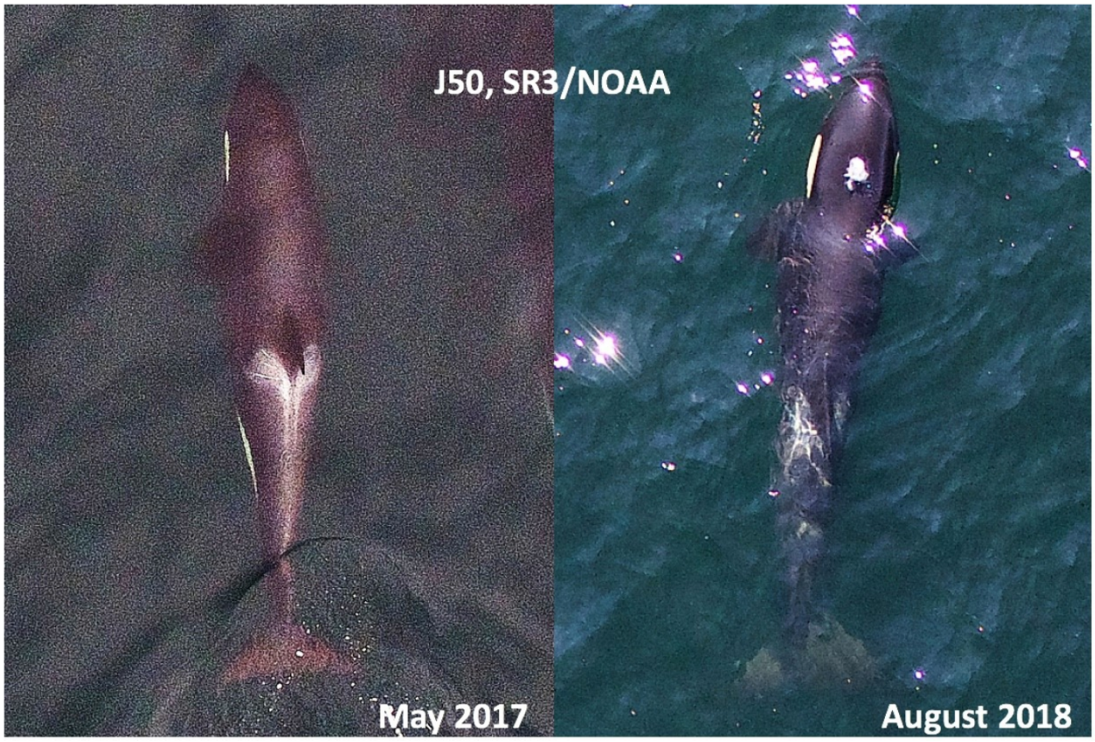

Figure 4.4 Images of Scarlet 2017 vs. 2018
Images of Scarlet taken in 2017 vs. 2018 show 'peanut head' condition, which happens because of emaciation. SR3 and NOAA took the images by drone.

By August 9th, a response team was doing something unprecedented – rather than just observe, they were actively interfering with Scarlet's health in an attempt to save her. The team shot her with a dart full of antibiotics, and on August 12th (the day after Tahlequah released her calf) the team released salmon near her in an effort to help her take in some nutrition. Puget Sound locals were already torn up about Tahlequah, and this author remembers hoping against all hope that the rescue efforts would save little Scarlet. Sadly, the emergency response efforts did not work, and by mid-September the 3-year-old whale was declared missing (as of May 3rd, 2019 she has not reappeared, and is presumed dead).

With the loss of Scarlet right after Tahlequah's baby, the summer of 2018 invoked a lot of empathy for Southern Resident Killer Whales, and outrage over their condition. NOAA set up public meetings in September to listen to the public's views and ideas, and emphasized the importance of the recovery task force (NOAA Fisheries West Coast, 2019). It appears to be working - as of April 28th, 2019 four bills that were a part of the task force's recommendations

have passed through both the Washington House and the Senate and are headed to Governor Jay Inslee for signing. The bills are listed here:

> "House Bill 1578 – Reducing threats to Southern resident orcas by improving the safety of oil transportation passed the House on March 7 with 70 yeas and 28 nays, and passed the Senate on April 10, with 32 yeas and 13 nays.
>
> Senate Bill 5918 – Providing whale watching guidelines in the boating safety education program passed the Senate March 7 with 48 yeas and 0 nays, and passed the House on April 7 with 90 yeas and 5 nays.
>
> SB 5577 (second substitute) –Concerning the protection of Southern resident orca whales from vessels passed the Senate on March 7 with 46 yeas and 3 nays, and passed the House on April 15, with 84 yeas and 13 nays.
>
> SB 5135 (substitute) – Preventing toxic pollution that affects public health or the environment passed the Senate on March 7 with 25 yeas and 24 nays, and passed the House on April 15 with 60 yeas and 37 nays.
>
> HB 1579 – Implementing the recommendations of the Southern Resident Killer Whale Task Force related to increasing Chinook abundance passed the House on March 7 with 59 yeas and 39 nays, and passed the Senate on April 10 with 26 yeas and 20 nays"
> (The Journal of the San Juan Islands, 4/28/19)

The Washington Legislature also approved a budget of $933 million toward the development of a long-term orca recovery plan, enforcement of vessel rules, and for hatchery operations that boost the stock of Chinook salmon and other key prey species (Investigate West, 5/2/19). These bills are a good first start for the recovery of Southern Resident Killer whales, and

combined with the emergency response attempt for Scarlet, are already significantly more than SRKW's have had in the last 50 years. The hope is that the anthropomorphism and resulting fierce public outcry from Tahlequah's tour of grief in the summer of 2018 will continue to fuel recovery efforts by putting pressure on WA and federal governments to make changes.

4.4 Chapter Summary

In the summer of 2018, a young J Pod mother, Tahlequah, gave birth to her second calf. The baby lived for about 30 minutes before passing away. Tahlequah mourned her calf by carrying her around for a record-breaking 17 days, more than five times longer than other killer whales grieved in this manner in the past. This mourning period caught the attention of global news media, and became known as her "tour of grief." Articles written about her had varying amounts of anthropomorphism, and people empathized deeply with Tahlequah, recognizing her grief and loss as the same as their own. This empathy, combined with the subsequent loss of three-year-old Scarlet, led to public pressure on Washington's government to pass conservation legislation. Governor Jay Inslee's Executive Order 18-02 (Southern Resident Killer Whale Recovery and Task Force) was passed in March, but it did not start gaining legislative ground until after the anthropomorphic media frenzy.

Key Takeaways:

1. Executive Order 18-02 Southern Resident Killer Whale Recovery and Task Force was created by WA Governor Jay Inslee in March 2018
2. Tahlequah (J-35) lost her calf in July, and carried her for 17 days in what the media called a "tour of grief"
3. Scarlet (J-50) starved to death in the same time period, despite unprecedented emergency response efforts
4. These events invoked a news frenzy with anthropomorphic language, and the public empathized strongly with the whales

Discussion and Implications for Future Conservation Efforts

Part I of this thesis provided definitions of anthrozoology, a recent field that is expanding rapidly. Anthrozoology is the study of human and animal interactions, and such research can discerned from biology and similar fields by looking for these four defining aspects:

1. Motivated by an interest in how the lives of people are shaped by interactions with animals
2. Motivated by respect and compassion for animals and an interest in their rights
3. Focused on individual animals as opposed to the larger populations or species
4. Published in journals (e.g*., Society & Animals, Anthrozoos*) and volumes (e.g., *Animals and Society, Social Creatures*) with names that identify the field

Although anthrozoology researchers have examined a diverse set of issues and themes, anthropomorphism is the facet focused on for thesis. Part I discusses what anthropomorphism is - the attribution of human traits to other non-human entities – and examines it in the context of human-cetacean interactions. Essentially, anthropomorphism of animals creates empathy, which promotes conservation considerate behavior. The more charismatic and similar to humans a species is, like whales and dolphins, the more it is anthropomorphized. This phenomenon was explored in Part II by looking at how anthropomorphism of Tahlequah, a southern resident killer whale, influenced conservation efforts for her highly endangered population. The results showed that the outpouring of compassion from the public inspired conservation action. The rest of this discussion will highlight the case study in more detail, as well as suggest future research topics.

This thesis found that the connection between anthrozoology and marine conservation needs to be further explored, specifically that of anthropomorphism of charismatic marine megafauna like killer whales. Cetaceans, especially bottlenose dolphins and killer whales, are some of the most recognized and beloved on marine mammals, and thus, draw a lot of attention and empathy from the public. This empathy is from anthropomorphism, because the more people relate to an animal, the more they care about it. The case of Tahlequah, J-35, and her deceased calf was examined for this thesis to see if Tahlequah's loss of her calf was anthropomorphized, and if so, to see if it influenced conservation efforts for Southern Resident Killer Whales.

The findings showed that not only was Tahlequah's loss of her calf anthropomorphized, the resulting outcry from the public increased conservation efforts. As Tahlequah carried her dead calf for days on end, the media got hold of the story and started calling it her "Tour of Grief." Seattle locals, U.S. residents, and people across the world felt bad for Tahlequah as her

story spread, and many identified with the mother whale, understanding her loss as similar to their own losses. Journalists and locals used words such as "mourning," "horror," and "sorrow" when describing what happened, words that are anthropomorphic as they are emotions that scientists have been unable to prove in non-human species so far. As Tahlequah carried her baby for her thousandth mile, another story appeared in the news – that of young Scarlet, J-50, a 3-year-old SRKW who appeared to be starving and falling behind her pod. The public was already worked into a frenzy over Tahlequah, so they were quick to demand action to save Scarlet. NOAA attempted to give Scarlet antibiotics and food in an unprecedented interference in a wild animal's life, but unfortunately were not able to restore her health and she disappeared soon after.

Anthropomorphism of Tahlequah's grief and the loss of Scarlet led to public pressure on Washington's government to expand efforts to restore the SRKW. Governor Jay Inslee's Executive Order 18-02 (Southern Resident Killer Whale Recovery and Task Force) was passed in March, but it did not start gaining legislative ground until after the anthropomorphic media frenzy. On April 28th, 2019 four bills that were a part of the task force's recommendations passed through both the Washington House and the Senate and were sent to Governor Jay Inslee for signing. NOAA is also working to restore degraded salmon habitat throughout rivers that drain into the Salish Sea and throughout the Northwest and the Columbia River Basin (NOAA, 2018). Hopefully the anthropomorphism of Tahlequah and Scarlet over the summer of 2018 will continue to improve conservation efforts for Southern Resident Killer Whales and someday move them off of the endangered species list.

North Atlantic right whale in South Georgia. Photo by Amy Kennedy

The case study for this thesis (along with other research papers) found that anthropomorphism of charismatic megafauna does positively influence conservation efforts for that species. But what of species that are not cute or liked? Right whales are not as charismatic as

other whales like humpbacks or orcas because they do not jump out of the water, and have large bulbous growths on their heads. However, they are in dire need of conservation action. North Pacific right whales number in the 30's, and are thus functionally extinct, but it isn't too late to reverse the decline of North Atlantic right whales, of which there are only about 450 animals left (NOAA Fisheries, 2019). Right whales got their name from early whalers because they have thick blubber, are slow, and float when dead, making them the "right" whales to hunt. They were hunted nearly to extinction in the 18th century, and have not rebounded due to ship strikes and fishing gear entanglements.

Despite this dire situation, the plight of right whales is not very well known by the public – mostly because they are not charismatic. Right whale recovery lies in human hands, so it is important to get people to care about them. Some improvements have been made as lobster fishermen on the East Coast became more aware of the struggle. They have worked to create innovative gear that releases the whales when they become entangled. It is a tricky problem though because vessel strikes and fishing entanglements are a consequence of people's livelihoods, and eliminating them in ways compatible with maintaining livelihoods may be challenging, as work on whale entanglements on the US West coast shows (Lebon et al., 2019) . One way to bring more attention and funding to these problems is to tie right whales to conservation campaigns for flagship species, such as dolphins, that live in the same area. By opening the public's eyes to the issues of other threatened cetaceans that inspire empathy, the result may be more funding and increased conservation efforts for the less fortunate species. The same could work for sharks or other fish that do not receive the same amount of love and attention as marine mammals.

Beyond charismatic or sublime marine mammals, there is a steady lack of exposure of the public to marine life. This happens for a number of reasons, including the fact that they live underwater and out of sight. Even if people do observe marine mammals in the wild, it is only for the time they spend above the surface, which is a limited part of their lives. Marine mammal parks such as Sea World somewhat alleviate the distance between humans and cetaceans, but they are increasingly controversial and have lost the support of many of their former visitors. All of the above make it difficult to raise awareness for conservation of marine mammals, but promoting research that shows the similarities between cetaceans and people may help conserve those species and their habitats (Chan, 2012). Publishing studies that show cetaceans have

similar intellects and social processes to humans will inspire empathy and anthropomorphism for them, meaning the public may act more conservation responsible, even if there are no discernable benefits for themselves.

More research is needed on cetacean emotion and cognition, as well as the effects of anthropomorphism, both good and bad, on conservation action. Language barriers prevent humans from asking animals about their emotional states, but the possibility that cetaceans (and other animals such as elephants and great apes) experience overwhelming emotions is difficult to ignore. Innovative techniques conducted by scientists with open minds, or even collections of anecdotal evidence by citizen scientists would be an improvement to the current literature on cetacean emotions. People spend so much of their lives talking to others about their emotions and thinking about their own, and yet are far from understanding themselves, let alone other species (Kuczaj, et al. 2012). However, the more animal emotions are studied, the less alienated those animals will become, and the more compassion people will feel for them. It is in this compassion that anthrozoology truly lives, because after all, the more humans understand and anthropomorphize non-human animals, the more they learn about themselves.

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