Tweeting Sharks

A New Actor in the Conservation Movement

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Abstract

In this master thesis, I investigate a new actor in the conservation movement – the tweeting sharks. The conservation movement consist of actors arguing for conservation, but also actors that masquerade themselves to exploit the legitimacy of the conservation movement's agency. I use Weber's understanding of legitimacy as the belief in authority throughout this master thesis. The belief in an actor's authority is important for the strength of their agency.

The new actor, the tweeting sharks, consist of various human and non-human actors and have become popular as well as influential in defining the role of the animal and the focus of conservation. My interest in pursuing this topic has been to understand how the tweeting sharks' structure achieve the necessary legitimacy to gain agency as a transformative actor.

The research question that guides this study is:

How do the tweeting sharks achieve transformative effects in the network of conservation?

I used an explorative research design and grounded theory for the data-collection throughout this research process. During analysis of this data, and subsequent data-collection, actor-network-theory and boundary object emerged as fruitful conceptual tools for understanding the tweeting sharks' influence.

I investigate three translation processes that have separate problematizations and different actor-networks. These translation processes are connected by two boundary objects that together create the tweeting sharks.

My results suggest that the structure of the tweeting sharks achieve legitimacy as a transformative actor in two ways: By allowing their audience to verify information and allowing the sharks' agency to manifest in the tweeting sharks due to the separation of translation processes.

The tweeting sharks' structure transform both the representativity of the animal and the focus of conservation. The sharks are transformed from an object into an actor, and the focus of conservation changes from the species to the individual. In effect, the sharks become an immutable mobile, maintaining their agency as the main actor within the tweeting sharks.

Acknowledgements

Writing this master thesis has been a challenging and rewarding experience. The more I investigated these tweeting sharks, the more I started to care about them. It struck me as incredible how this phenomenon could evoke so many emotions in me, especially once I learned that one the most influential sharks went missing. These tweeting sharks are not normal entertainment-objects, and I hope I will convince the readers of this master thesis of the same.

I would like to thank those that made this master thesis possible. First, and foremost, I would like to thank Susanne Bauer for excellent guidance as my supervisor throughout this process. Her contributions have been highly valued. I would also like to thank Pål Anders Opdal for constructive criticism on structure and writing style, and Sidsel Sandtrøen for critical reading and constructive feedback on the structure of the master thesis. In addition, I would like to thank Frans Joakim Titulaer for excellent discussions throughout this process.

Finally, I would like to thank Petter Bøckman for sharing his great insight into communication of animals, and Rob Landers and Jim Ware for their contributions to my understanding of the tweeting sharks.

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1 Introduction

In this master thesis, I investigate a new type of actor in the conservation movement. Through utilization of a complex infrastructure, tweeting sharks have become active participants on Twitter. These sharks are not fictional, but real animals that traverses the world. In social media, they give us insight into their "day-to-day" ventures while generating awareness of conservation issues in their audience.

The most popular of these tweeting sharks, Mary Lee, have over 129.000 Twitter-followers (Mary Lee the shark, n.d.). By all accounts, she is an influential actor, making headlines in the news while she traverses the oceans (see, for example, Radel, 2017). However, Mary Lee has achieved more than just influence. She has become a legitimate authority on conservation issues. As the creator of Mary Lee's Twitter-profile told me: "the most memorable troll was a local political candidate who began to advocate culling of great whites after a shark was spotted feeding off a popular beach. The candidate's research was lacking and he tweeted erroneous material in his bid for election. Eventually Mary Lee had to step in and set him straight, though she did it ever so politely – and with a graphic" (Interview with Jim Ware).

My investigation will try to illuminate this perplexing idea of a tweeting shark as an actor with transformative effects in the conservation movement, able to change how we view nature and nature conservation. How can this emerging phenomenon, consisting of its own network of actors, achieve transformative effects on the network of conservation as a whole? The research question that have guided this investigation is:

How do the tweeting sharks achieve transformative effects in the network of conservation?

1.1 Conservation and the conservation movement

Before illuminating the specificity of the tweeting sharks, I will discuss the overarching network in which it acts. As an umbrella term, the overarching network I refer to is the network of conservation. I do not limit this network to only those who argue *for* conservation, but *all those who participate in conservation-related discussions*. In other words, all actors that *influence* conservation are relevant within this network.

Within this network are several actors, for example fisheries, zoo's, documentary creators etc. These may themselves consist of networks of actors and have differing agencies which influences the discussion of conservation. In this thesis, I focus on an actor within the conservation movement – a term I use to signify a network of actors arguing *for* conservation. Before discussing the role of the conservation movement, however, I will define conservation and how conservation become important.

Conservation is, strictly speaking, "the protection of plants and animals, natural areas, and interesting and important structures and buildings, especially from the damaging effects of human activity" (Conservation, n.d.). It is the protection of "something" from some type of interference. What is this something, and what is this interference in nature conservation?

As Kristin Asdal (2011) has pointed out, what is important in 'nature' is co-constructed with politics and science. The importance of 'Nature' is not apparent before it is formulated as such through issues raised through scientific inquiry and public debate (Asdal, 2011). In other words, what is important is arguments believed to be important. In her book, Asdal looks at how nature, and the protection of nature, rose to importance through utilization of arguments based upon scientific research and public concern (Asdal, 2011). Affected actors in the debate used, among others, scientific results, grounded by measurements done through usage of technology, to persuade the government to protect nature (Asdal, 2011).

This line of thought can be pursued all the way back to the "Dewey and Lipmann discussion", where Dewey paved grounds for the understanding of a "public" (Dewey, 1991). According to Dewey, "the public consists of all those who are affected by the indirect consequences of transactions to such an extent that it is deemed necessary to have those consequences systematically cared for" (Dewey, 1991:15). A public is thus not a spontaneous movement appearing from "thin air" but rather a reaction to an issue that they believe is important. A necessity of a public is that these issues *cannot* be fixed within the paradigm of current institutions (Dewey, 1991). The goal of a public, then, is to get these issues regulated by a representative, someone that the public can hold accountable (Dewey, 1991). As Kristin Asdal points towards, the public *argues* for the necessity of fixing these issues.

My usage of the term "the conservation movement" is in this thesis limited to a specific type of actors within a specific context of conservation. I refer to actors that operate within the context of *nature* protection. The actors that fall within this distinction are actors that argue

for protection of nature. While not being the only relevant actors in conservation discussions, they are the actors that bring conservation issues to the fore. I sympathize with Dewey's concern: "the actual alternative to deliberate acts of individuals is not action by the public; it is routine, impulsive and other unreflected acts also performed by individuals" (Dewey, 1991:18). In other words, without these actors arguing *for* conservation, one might be tempted to believe that nothing will be conserved in the first place.

The conservation movement can be considered a public in a general sense, as it *formulates issues* and *urges action* that current institutions cannot fix. Not all actors pursue political goals, and some, like the tweeting sharks, are more influential in changing attitudes that make conservation possible. These actors help generate awareness that make policy measures gain support. Actors that do urge policy changes, for example, the International Union for Conservation of Nature (IUCN) draw upon the public support in changing policies.

IUCN, for example, formulates a need to conserve sharks, rays and chimaeras. As IUCN present it: "Overfishing is the main threat to the species, according to the paper. Reported catches of sharks, rays and chimaeras peaked in 2003 and have been dominated by rays for the last 40 years" (IUCN, 2014).

IUCN utilizes a similar strategy as the actors described by Kristin Asdal (2011). By presenting this report, IUCN establishes a *scientific basis* for an issue directly related to the fishing industry. It is this scientific basis, they argue, which *legitimizes* the need for conservation. In this article, the organization also establishes a goal for this public, created by the formulation of an issue: "Significant policy strides have been made over the last two decades but effective conservation requires a dramatic acceleration in pace as well as an expansion of scope to include all shapes and sizes of these exceptional species. Our analysis clearly demonstrates that the need for such action is urgent" (IUCN, 2014). Through this argument, the conservation of sharks, rays and chimaeras become a *public issue*, in which they point out the need for a dramatic acceleration of conservation measures directed by the state. It is a convincing argument in a public debate, trying to influence policy directions.

My discussion of the conservation movement is a positive one, arguing that the conservation movement is necessary for illuminating important issues. This presentation makes it seem like the conservation movement is a unified public, arguing about something akin to "the best argument", as Habermas would describe it (Pellizzoni, 2001). However, the necessity of

illuminating important issues does not mean that all actors identifying with this movement pursue conservation-related goals. Beatty's article from 1954 gives telling signs that even at its time of writing a range of actors were pursuing different aims under the common header of the conservation movement. Not all conservation movement actors had noble goals, and the movement consisted of both those that were concerned about nature and those who exploited it (Beatty, 1954). This is not too dissimilar from the nature conservation movement today, which consist of "a plethora of ideas, practices and values, differing for individuals and organisations alike" (Van der Wal et al. 2015:661).

The multifaceted nature of the conservation movement makes the *argument* but also the *actor* important. A belief that the conservation movement is always *for* conservation also enables actors to exploit the intended agency of this movement. I believe that this is to be taken seriously. Considering the mission-driven nature of nature conservation (Van der Wal et al. 2015:663), my position is that one ought to analyze both the validity and legitimacy of the actors as well as the missions put forward. What do the conservation movement actors base the validity of their claims on, and how do they legitimize themselves and the need for conservation?

My usage of legitimacy derives from Max Weber, which defines legitimacy as "the basis of every system of authority, and correspondingly of every kind of willingness to obey, is a belief, a belief by virtue of which persons exercising authority are lent prestige" (Weber, 1964:382). As this quote illustrate, a fundamental aspect of legitimacy is that we believe in an authority's right to authority. If an actor doesn't have legitimacy, no-one will take the actor seriously. The actor's legitimacy is therefore important for its agency. However, the *reason* why an actor achieve legitimacy is not problematized in this definition. Legitimacy can, for example, be grounded through scientific arguments, but can also very well be *imposed* through various means, including obfuscation of reality. Fake news, bias or "cherry picking" arguments can, for example, skew our view of an actor, turning what would have been deemed illegitimate into legitimate.

This is not to say that all, or most, conservation-related missions and actors are illegitimate. Rather, it is an interesting starting point to investigate how they *achieve* legitimacy. As I will discuss next, this is especially important when digital technology is introduced in the conservation movement.

1.2 Digital conservation

Digital technologies have broad implications for how we view reality (Büscher, 2012). When digital technologies are introduced in the conservation movement, a myriad of new possibilities and challenges appear (Van der Wal & Arts, 2015). The tweeting sharks utilize digital technologies, for example through usage of Twitter and an online interactive map. Technology is not *just* a tool when utilized in pursuance of conservation. They are formative powers, which can be both positively and negatively valued (Van der Wal & Arts, 2015:662).

Science and technology-studies is familiar with the formative powers of technology. Latour and Woolgar (1986), for example, pointed out how technology was used to achieve legitimacy in science. By conducting a scientific study with the right technology, not only could the scientists transform a substance from one form into another, but it also made their argument valid in the view of the scientists' peers. The technological equipment, and the scientists' skillful use of it, gave power to the argument they put forward (Latour & Woolgar, 1986:70). The belief that the right usage of technology can produce a valid argument, is also why it is considered a valid argument. In other words, the skilled usage of valid technology legitimized the scientific findings as valid.

However, we often imagine technology as a material artifact, being physically present in the environment. As Leonardi (2010:1) argues, the importance of *digital* technology has thus not been fully acknowledged as a formative power due to its lack of a "material form". The digital exists in an abstract plane, for example *inside* a computer, and does not appear with a physical substance. In addition, it can exist multiple places simultaneously, not being present in only the one local computer. He thus argues that we need to redefine materiality and understand digital technology not through its physical substance but by its relational context. We need to focus on its practicality and significance (Leonardi, 2010). With this redefinition, it becomes clear that digital technology is just as much a part of structuring reality as those with physical properties. It is the practical and significant usage of technology that *matter*. Digital technologies can structure reality not only locally, but globally. Not only in one place, but in multiple places simultaneously (Leonardi, 2010). It's practicality and significance, for example, is clear in the usage of Microsoft word, a highly practical and significant technology in structuring reality. It is used as a typing-program, and through this usage have significant consequences for how we approach typing. My anecdotal experience, for example, suggests

that in today's world it is rare to see someone typing a master thesis by hand or on a type-writer.

Another example is Google Maps. A walking trip, for example, takes 15 minutes from point A to point B because Google Maps says it does. If we accept this statement as true, we ought to schedule our travel route and possibly consider if going by car would be more beneficial. In this example, Google Maps offer practicality; It helps us determine the best route of travel, and thus structure how we think about travel. Google Maps also gain significance because we use it for its practicality. It is a structuring tool that have formative power on how we view reality. Following Star's (1999) discussion on infrastructures, while google maps nowadays is normally taken for granted, it's significance might lead to consequences if it were to break down.

As this example illustrates, digital technologies must be seen to have the same formative power as other technologies. This is true whether the use-case is scientific experiments, a map used for travel planning or telecommunications for holding personal conversations. However, all technologies' significance is also based upon the belief of their significance. It rests on the notion that we trust the information or opportunity the technology provides. If we did not trust this information, then the usage of this technology would also be meaningless.

This dual-property of technology, and especially digital technology, provide an interesting point of discussion within nature conservation (Van der Wal & Arts, 2015:661). While allowing new ways of viewing nature, it simultaneously changes what nature is (Van der Wal & Arts, 2015). Nature has gone from being something "out there" to something available with a mouse-click. Yet, this form of nature is markedly different from the nature out there. A great white shark, for example, would probably be greeted by the audience differently if encountered while swimming in the wild than on the YouTube-video playing on the computer screen. This change of what *nature* is, is certainly not without its problems. Digital technology might very well be misused disguised as nature conservation.

Digital technology might, for example, be used to tamper with what constitutes pristine nature. It might give an artificial impression of nature to appeal to its audience. As Horak points out, animal documentaries are not realistic accounts "but are artificial constructs which are largely dependent on classical documentary film techniques" (2006:461). These depictions of animals, in many cases, have highly ideological meanings. For example, the demonizing of

sharks or animal reality-tv (Horak, 2006). This is not only apparent in documentaries. When I searched google for "Shark", the first page gave me, among others, the hits: "10 TERRIFYING Shark Encounters Caught On Tape" (The Richest, 2017) and "How It Feels To Be Chased By A Great White Shark" (Barcroft TV, 2014). Muter et al. (2012) found that there was a significant negative bias in shark representation *even* in news-sources.

By creating depictions of nature, we thus simultaneously change how we view nature. One might, for instance, assume that animals are constantly hunting in an action-packed environment. Artificial nature might give the impression that it is pristine nature, unbeknownst to its audience (Büscher, 2012:1).

Nature might also become a commodity used for capital gains. An organization can gain a monopoly on information or sell nature experiences, arguing that doing so is necessary to ensure its survival (Büscher, 2012:2). Horak (2014) argues that there has been a growing awareness about conservation issues in documentaries. Yet, "animal documentaries, particularly on television, have no other ambition than to allow for the consumption of images (of animals), interspersed with advertising for products bought by animal lovers" (Horak, 2014:473). It might thus seem as if the sensational and entertaining get priority over accuracy. News about animals might very well be tailored towards viewers interests rather than the interest of the animals themselves.

Digital technologies have great impact on what constitutes nature and nature conservation (Büscher, 2012:3). My discussion on this subject is therefore of importance for understanding the lens I view the tweeting sharks through. Tweeting sharks are not just an entertaining technological development, but a formative power of what constitutes nature and nature conservation.

When investigating how the tweeting sharks can achieve transformative effects on what conservation entails, I must also investigate how the tweeting sharks garner legitimacy to do so. What is the reason for the acceptance of the tweeting shark's legitimacy?

1.3 Animals in media

As Kirby points out, an important element of legitimacy of science in the public realm is the witnessing of science being conducted (2011:24). The term science is here understood as the process leading to the outcome. In other words, that the usage of the technology (capability) leads to the results being argued. Whether we believe the representation of a dinosaur, or the possibility of air-flight is thus dependent on the witnessing of it (Kirby, 2011). Directly witnessing an air-flight is possible, and available to many of us regularly. We would be hard-pressed to never have noticed an airplane flying in the sky above us. However, directly witnessing a dinosaur is (at least today) impossible.

In times when we cannot directly witness science being conducted, we turn to indirectly witnessing through "virtual witnessing technologies" (Kirby, 2011:25). These are capabilities for witnessing, for example news stories, popular science stories, public lectures or documentaries. While we may be able to watch the experiment itself through these technologies, we are not always able to. These technologies thus have another important effect. They show compelling evidence that the experiment and the result must have occurred, without recreating the experiment (Kirby, 2011).

Consider, for example, a news story stating that "we have landed on the moon". This story cannot show the moon-landing happening, but may provide pictures, scientific information, information about the narrative leading to this event etc. The accumulation of indirect evidence thus makes the moon-landing believable. As such, these witnessing technologies are just as important as the studies themselves, in legitimizing their validity in the public lens.

However, can we trust these witnessing technologies? As Kirby (2011) argues, modern special effects blur the line between what is real, and what is fictional. It turns out that it is difficult to distinguish between what is real and what is depicted as real. This is the case, for example, with dinosaurs. While scientists are unsure of whether they looked as represented in Jurassic Park, we still believe this depiction due to its realistic effects (Kirby, 2011:28). They move realistic, act realistic, look realistic. They show compelling evidence for how they must have been like. Dinosaurs may thus appear to be *legitimate*. This is not even contained within movies themselves. Kirby showcased a hypothetical situation where someone found a can with the scientific markings "WARNING: BIOLOGICAL MATERIAL" (Kirby, 2011:21).

Needless to say, this might easily create widespread panic, even though the content itself might not be harmful.

The point I am making is that these sources of information may legitimize beliefs about reality which aren't necessarily valid. From YouTube-sources one might perceive of sharks, for example, as human hunting machines, glossing over the fact that such attacks rarely occur. We might perceive of bears as cute and fluffy, while at the same time ignoring that they are ferocious predators. This might seem innocent enough, but as I've already mentioned in the case of sharks, they may very well have real consequences.

As I've discussed so far, the conservation movement utilize technology to generate strong arguments, for example arguments based on science. However, they must also convince the lay-person that these arguments are legitimate. In the digital age, where information is abundant and fighting for attention has gotten ever more predominant, they may change the content itself to match the viewers interests. Due to realistic representations, we might not be able to accurately discern between fact and fiction. Animals may very well be tailored to fit our own needs rather than their own. However, could this be changing? In the next sub-chapter, I will look at how the tweeting sharks fit into this discussion.

1.4 Tweeting sharks: a new actor in the conservation movement

The previous discussion might seem very anthropocentric. This is not by chance, as the normal projection of animals is as objects which are to be saved or to entertain us (Horak, 2014). Yet, we do know that animals are not without agency.

As Burt points out: "To take a famous example, when Lassie climbs out of a river and, instead of doing what comes naturally to a dog, which is to shake off the water, he staggers about bedraggled and exhausted, this is seen as a mark of what makes Lassie such a great actor" (Burt, 2002:32). In this quote, Lassie's agency is pointed out. Instead of being a mere object, Lassie responds to the relational context in which he is put in. He also has *transformative effects*, changing what a dog is and the context in which he acts. He acts according to how he has learned to behave in the situation, but simultaneously changes what a dog is in this situation by so doing. In effect making a new situation emerge.

When I first learned of the tweeting sharks, I dismissed them as humorous but insignificant entertainment objects. They reminded me of the normal depiction of animals one would see in social media, like cats, dogs etc. However, I couldn't shake the feeling that the tweeting sharks were "more than meets the eye".

It was already apparent that the portrayal of these sharks was *different* from the normal portrayal in media sources and documentaries. Instead of being "mindless killers", they were given a name, a personality and a *presence* in the social landscape. It was possible to get to know the sharks, their relationship to each other, and what they stood for.

However, this also came with the realization that the focus had changed from someone representing the sharks, to the sharks representing themselves. They were *individuals*, taking part in conservation discussions on Twitter. But how exactly? As it turns out, the tweeting sharks are tracked by a satellite-tracker called SPOT-tag (OCEARCH, n.d.-c).

The satellite-tracker is a rather new development. It first developed as a radio-tracking technology, originating somewhere around 1960 (Benson, 2010). It was a technological development fraught with discussion within a huge network of actors, including military and political. All though tracking of wildlife at first consisted of radio tracking, satellite tracking became a viable alternative in the 1990s (Benson, 2010).

The story behind the development of satellite-tracking is an interesting one, and closely tied to killer whales (Benson, 2010). Research on killer whales was a controversial topic, especially within the conservation movement, and was dominated with efforts to stop the research on this marine species (Benson, 2010). It was both dangerous for the animal to use tracking technologies, and the radio-tracker did not function optimally (Benson, 2010). While satellite-tracking technologies emerged in the 1990s, it was still controversial to utilize them (Benson, 2010:182).

Perplexingly enough, it was the movie-star Keiko, a killer whale from "Free Willy" that played an important part of changing the landscape for tracking technologies (Benson, 2010:181). An organization known as the Free Willy/Keiko Foundation wanted to release Keiko into the wild after several years in captivity. The Marine Mammal Commision and National Marine Fisheries Service argued that this would be impossible without the usage of tracking technology (Benson, 2010:181). When the Free Willy/Keiko Foundation agreed with

this argument, Keiko's release in 2000 became a milestone for an acknowledgement of the necessity of tracking wild marine animals (Benson, 2010:183). While this release was not a complete success (Keiko did not manage to completely adapt to wilderness), it paved the way for acceptance of utilization of tracking technologies within the conservation movement.

After the development of satellite-tracking during the 1990s, and the release of Keiko in 2000, the development of satellite-tracking has developed tremendously (Benson 2010:189). The utilization of technologies has improved other unexpected areas which has brought the general public closer to the animals. As Benson describes it: "…scientists could now be seen as mediators of a kind of virtual intimacy between individual animals and mass audiences, or even as audiences themselves" (Benson, 2010:190). It changes the dynamic of *representation*, and subsequently our view of nature.

The tweeting sharks are not just Twitter-profiles. They are a new development of the usage of tracking-technologies. The tweeting sharks are linked together by (among others) expeditions costing an incredible amount of money, real sharks, various human actors with different agencies, capture- tracking- database- and social media technologies, as well as text, images and videos; all sewn together to create a 'tweeting shark'.

This complexity makes for a fitting study of this phenomenon. How does the structure of the tweeting sharks achieve the necessary legitimacy for transformative effects?

1.5 Research question

The discussion I have brought to the forefront illuminates the importance of human, technological and animal actors in the network of conservation. As I have shown, all three have capabilities to achieve transformative effects on reality. However, their agency is also dependent on the legitimacy of the actors. The tweeting sharks is a mixture of many types of actors with different agencies.

As I pointed out in this discussion, not all representations of animals are accurate, and not all representations are meant to be beneficial for the animal itself. However, might the tweeting sharks change this? The tweeting sharks differ from the "traditional" objectivist representation of animals. The shark in each tweeting shark can influence the tweeting shark's persona. How they choose to act, have direct consequences for their portrayal.

The research question is:

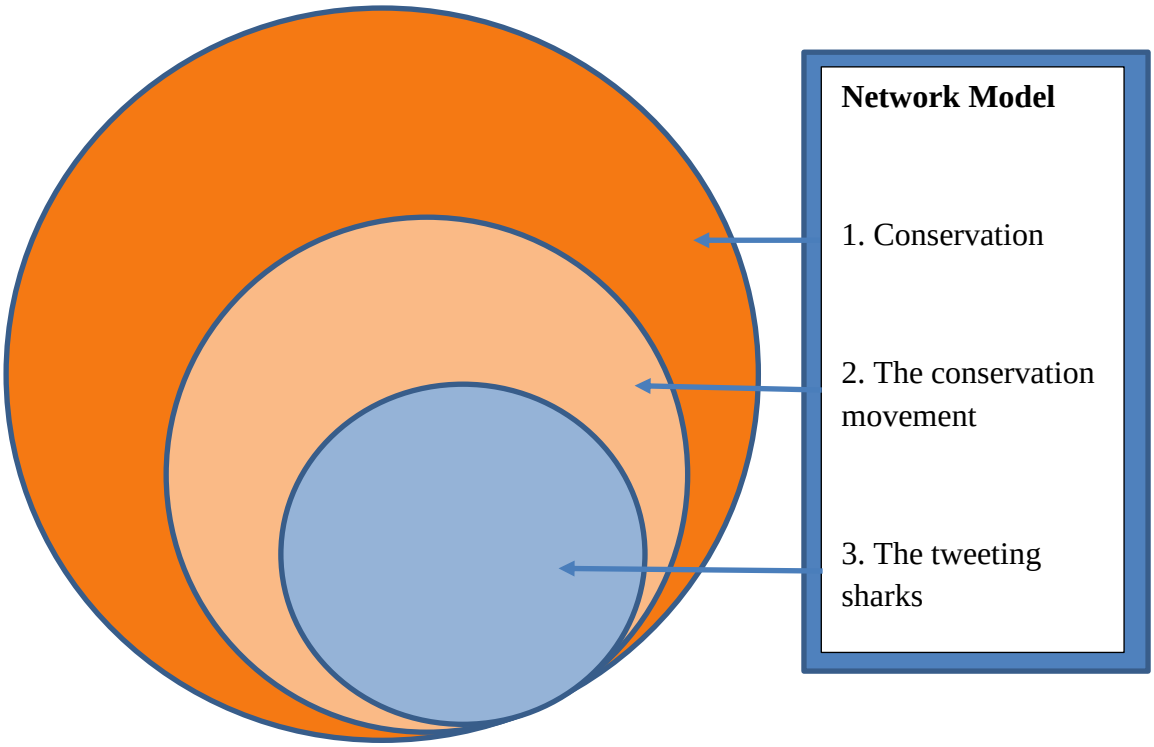
How do the tweeting sharks achieve transformative effects in the network of conservation?

I started my investigation of the tweeting sharks by using an explorative research design and grounded theory for the data-collection throughout this research process. The data I collected suggested that actor-network-theory and boundary object were fruitful in explaining their transformative effects.

I will utilize these theoretical concepts to analyze how the structure of the tweeting sharks can achieve transformative effects in the network of conservation (Star & Griesemer, 1989; Latour, 2005). This has allowed me to analyze the tweeting sharks symmetrically, understanding how human and non-human actors influence the translation processes leading up to the tweeting sharks (Latour, 2005).

In order to answer this research question, I will follow the actors through the identified translation processes from the initiation until the creation of the tweeting sharks. During this analysis, I will also illuminate how they become perceived as legitimate actors, and how the sharks' agency influences the tweeting sharks.

Below I illustrate how the network of conservation is organized:



Model 1: Network Model.

Within this main network of conservation are several actors. This network (1) consists of all actors that participate in conservation-related discussions, regardless of whether they are for or against conservation. The conservation movement (2) is another network (or actor-coalition) consisting of actors that argue *for* conservation. Actors within this network I regard as a public, making nature issues important policy topics. The tweeting sharks (3) is the last category and the focus point of this master thesis. It consists of various actors that together make the tweeting sharks a possible phenomenon.

I will investigate how the structure of the tweeting shark (3) network creates opportunity to influence the conservation movement (2) and conservation (1).

The master thesis is limited to the construction of tweeting sharks, how they achieve legitimacy and how they achieve transformative power of the conservation network. In the infrastructure that make up these tweeting sharks, the various actors have different agencies, and I (as an observer) have yet another. My role is to analyze the tweeting shark's transformative effects, and not discuss how they perceive their role. This is similar to the

description given by Susan Leigh Star, in which she observes how components in infrastructures give different meanings among actors in a relational context (Star, 1999:380).

The master thesis will hopefully be a contribution to the discussion on utilization of digital technology in the conservation movement. It does not reflect other areas of study, such as the quantitative impact of the tweeting sharks or a moral judgment on whether this is a good development or not. I do not discuss factors outside of immediate relevancy to the creation and transformative effects of these tweeting sharks.

1.6 Structure of the master thesis

The master thesis is structured as follows. I start by discussing the methodology that have guided the data collection and coding of the data. The first section of the chapter will contain a description and discussion of the relevant aspects of 'explorative research design' and prescribed approaches to 'grounded theory' and how this pertains this study. Thereafter, I will provide a chronological account of the research process, including methodological concerns, until the finalizing of the master thesis.

Then, I will discuss the various analytical perspectives I utilize in this study. This chapter will elaborate on, and discuss, actor-network-theory and boundary object.

In view of the discussion of methodology and analytical perspectives, I will analyze what a tweeting shark is and how they gain legitimacy as a transformative actor in the network of conservation.

Finally, I will discuss my research question in and provide a summary for the findings and possible research topics for future studies.

In summary, the master thesis will contain the following elements:

- Introduction
- Methodology
- Analytical perspectives
- What is a tweeting shark?
- Discussion
- Conclusion

2 Methodology

I started by utilizing an explorative research design in my investigation of the phenomenon 'tweeting sharks', due to the novelty of this phenomenon. My main purpose was to understand what made these tweeting sharks appear interesting to me. The analysis of my findings was inspired by a grounded theory approach. Grounded theory is a common furthering of the explorative research design and is fruitful for providing research direction within the data material (Stebbins, 2001). I used this approach before settling on any given framework, as I did not want to be blinded by following one research direction. After learning more about the tweeting sharks, I became more interested in understanding how they achieved their popularity and transformative effect.

My data collection and analysis thus brought me towards incorporation of the actor-network-theory and boundary object. This analytical framework allowed me to symmetrically analyze the various non-human and human actors, and the relations between them (Latour, 2005; Star, & Griesemer, 1989). I have decided to not include actor-network-theory and boundary object in this chapter, but rather describe them in chapter 3. This has been to highlight the importance of these conceptual approaches. Actor-network-theory and boundary object are the concepts that I use throughout my analysis of the results in the master thesis. I thus wanted to dedicate a separate chapter to elaborate these analytical concepts more rigorously.

My reason for doing so is to make the distinction visible between my usage of the explorative research design, grounded theory and data-collection, and the analytical framework which I have utilized for my final analysis of the data material. While the analytical framework is part of the methodology

This chapter contains an elaboration on and a discussion of the methodological considerations I made before and during the study. I will start by illuminating the combination of an explorative research design and grounded theory, why I chose to utilize this approach and how it impacted my investigation of the subject. This includes a discussion of sampling strategies, implications for analysis and coding of the data material.

After the initial discussion of the methodological framework, I will describe and discuss how I conducted the study.

2.1 Explorative research design

Finding a relevant research design for my master thesis was a challenge given the novelty of the field I am studying. Not much is known about the usage of digital technology in conservation (Van der Wal & Arts, 2015). However, it was precisely this novelty that made an exploratory research design seem like a fitting choice. The field of d*igital Conservation,* i.e. the study of digital technology usage in conservation (Van der Wal & Arts, 2015), has only had one special issue related to it, and the role of tracking technologies in conservation-related animal communication practices has, to my knowledge, only had one scholarly article associated with it at this time of writing. This article was not relevant either, due to its focus on algorithmic programming, which is not a characteristic of the tweeting sharks.

In other words, there was not much earlier research to base this study on. Van der Wal and Arts (2015) even states the need for more empirical research explicitly in their introduction to digital conservation. My investigation thus needed to start by 'mapping' important moments within the process of creating the tweeting sharks, including relevant actors and the infrastructure in which it exists.

This made it clear to me that there is not a foundation for saying that one source of data, either from interviews, documents or other quantitative or qualitative data-collection methods is preferable for understanding the tweeting sharks. By using an exploratory research design, I gained the flexibility to choose the data material based on circumstantial elements, combining various data to understand the phenomenon more broadly than what I could have if I limited myself to a certain method. Instead, I let the data itself provide direction for further data collection.

But what is an explorative research design? As Stebbins points out, the term exploration is complicated and contain a lot of different approaches of discovery (Stebbins, 2001:2). Stebbins differentiate between four ways of exploring. Exploring can either be to "study, examine, analyze, or investigate something", "to become familiar with something by testing it or experimenting with it", "to travel over or through a particular space for the purposes of discovery and adventure" or "to examine a thing or idea for diagnostic purposes" (all quotes in previous sentence from Stebbins, 2001:2).

It is this third sense of exploration, "to travel over or through a particular space for the purposes of discovery and adventure" Stebbins argue best describe the exploratory research design (Stebbins, 2001:2). While I have not taken this quote literally, my usage of this design has been to investigate this phenomenon before attempting to pinpoint what it is. Before deciding on a research question and research direction, I investigated various analytical frameworks for this study. Should I, for example, pursue a valuation study or an actor-network-study? I decided to pursue an actor-network-theory approach, due to its fruitfulness in explaining how this phenomenon was possible.

An explorative research design brings flexibility to the case I am studying. John Law (1999) argued that actor-network-theory has been too simplified, and due to this simplification eroded the complexity inherent in networks. It was too simple to just "stick" a label on who is the actors, and what are their relations. Understanding these tensions was an important consideration and was made possible to pursue within this explorative research design.

As I mentioned earlier, the tweeting sharks have risen to popularity, legitimacy and influence. This was the main reason that I found this topic of study interesting. The explorative research design was fruitful for a broad approach to this topic. However, using an explorative research design also provided some limitations. I could not beforehand pinpoint what was relevant and what was not. This meant that I had to do a lot of research before I could start the final step of the analysis.

My chosen research design also had consequences for the types of data-material I gathered. In an explorative research design, flexibility and open-mindedness is important (Stebbins, 2001:6). Unlike qualitative approaches, an explorative research design is open towards both qualitative and quantitative sources (Stebbins, 2001:6). The emphasis in an explorative research design is to develop theory from data, where the "most efficacious approach is to search for this understanding wherever it may be found, using any ethical method that would appear to bear fruit." (Stebbins, 2001:6). The end-goal being "the production of inductively derived generalizations about the group, process, activity, or situation under study" (Stebbins, 2001:6).

This implies an orientation towards several types of sampling-techniques where gathering relevant data is more important than consistency in source-types. It means that the study is not subject to one type of sampling-technique, i.e. theoretical sampling, snowball sampling,

systematic sampling, accidental sampling etc. but depends on what emerges from the situation (Stebbins, 2001:9).

A natural development from the data collection in exploratory research studies is the weaving of generalizations from the data material into grounded theory, or other theory that emerges from the data (Stebbins, 2001:9). In the next sub-chapter, I will discuss how I utilized grounded theory in the generation of concepts from the data-material, as well as subsequent data collection and testing of validity.

2.2 My usage of grounded theory

As already mentioned, grounded theory is a possible direction in analysis and ensuing further data collection in the explorative research design. I utilized this approach to analysis before moving onto the actor-network-theory. My study did not follow the design of grounded theory completely, as the overlying research design is explorative. However, it has contributed in important ways to coding, data analysis and subsequent data collection.

Grounded theory is not a single method, but rather a collection of methods that are "systematic, yet flexible guidelines for collecting and analyzing qualitative data to construct theories from the data themselves" (Charmaz, 2014:1). The main purpose of grounded theory may thus be said to be theory generation (Charmaz, 2014:1). However, this notion of "theory generation" is disputed even within the grounded theory community (Charmaz, 2014:228). Charmaz separates between the positivist perspective, in which theory assumes a relationship between the phenomenon and the abstract concept used to describe it (Charmaz, 2014:229), and the interpretive perspective, in which theory interprets a phenomenon for greater understanding rather than stating causality (Charmaz, 2014:230). These two perspectives are divided into two forms of grounded theory: objectivist grounded theory and constructivist grounded theory (Charmaz, 2014:235). It is difficult to pinpoint which form of grounded theory this study should be interpreted as. In my view, it contains elements of both, arguing that there is an external reality while simultaneously acknowledging my subjectivity in this investigation. However, both forms of grounded theory are *rhetorical*. They present an argument about the world, by which they attempt to convince its readers (Charmaz, 2014:232). In this sense, my study is as much an argument about the world as it is an investigation of it.

Thus, to be able to present my findings with any form of validity, I have utilized *constant comparative methods*. Constant comparative methods refer to a constant comparison between the data material. It is used on all analytical levels, and are used to establish analytical distinctions (Charmaz, 2014:132). This has for my study meant scrutiny of various data sources, and my interpretation of them, to identify similarities and differences. For example: Do the interviews match up with written accounts? Do the claims made seem feasible for what has been undertaken? Is my categories and codes represented among the data sources? What do previous literature, news articles and common sense say about the validity of claims? In what way does my interest influence my interpretation?

2.2.1 Conducting grounded theory

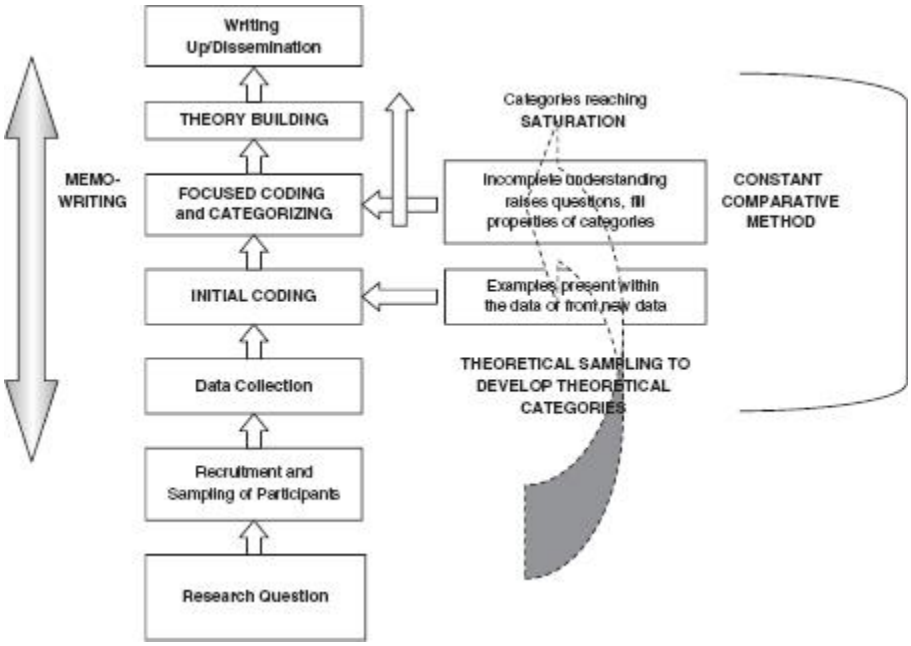
While grounded theory may contain several different elements, I have only utilized some in this study. These are:

- Simultaneous data collection and analysis in an iterative process.
- Constant comparative methods
- Draw on data (e.g. narratives and descriptions) in service of developing new conceptual categories.
- Emphasize theory construction rather than description or application of current theories.

  (Charmaz, 2014:15; Star, 1998:221).

Data collection and analysis has in this study been conducted simultaneously. This means that my analysis of the gathered data material has guided the direction for further data collection. I've used comparative methods to accomplish this, testing and supplementing my understanding by conducting interviews and searching additional data. This has also meant that I've drawn on data to further my understanding about and analysis of the subject. I've also emphasized developing categories based on the data material instead of application of current theories. This is not to say that I have not sought out analytical perspectives, but that these became viable due to the data gathered.

The conduction of grounded theory follows a specific, yet flexible pattern that is meant to guide the research process. Charmaz have made an illustration of how this process is done, which I will show on the next page.



Model 2: Model from Charmaz (2014:18).

While my "research question", "recruitment and sampling of participants", and "data collection" have been done through the methodology of the explorative research design, I have been inspired by the steps illustrated in this model when coding and analyzing the various data collected. In the following sub-chapter, I will go into greater detail on initial coding, focused coding and theoretical coding.

2.2.2 Coding

Coding entails "categorizing segments of data with a short name that simultaneously summarizes and accounts for each piece of data" (Charmaz, 2014:111). It is labeling data with an abstraction, making it useful for analytical purposes. While coding in grounded theory describes the data material it also "*define* what is happening in the data and begin to grapple with what it means" (Charmaz, 2014:113). Codes are thus both descriptive and interpretive, describing what is in the data material but simultaneously representing the lens of the person coding the data (Charmaz, 2015:113). As Star (2007:80) points out, a code also establishes a *relation* with the data material and the informants in the study. When going through various abstraction levels in the coding process, this locality will gradually diminish. A key element is thus to balance the locality of the material with the abstraction needed of a theoretical analysis.

Initial coding is the first phase of coding that is used when gathering data (Charmaz, 2014:112). It serves to "map" out the essence in the data material and, in turn, enable the scientist to perceive "holes" in the data material or data material with special significant (Charmaz, 2014:112). Not only is initial coding important in understanding the data material but also to point out what is not apparent within this material. This is a shared trait of both explorative research design and grounded theory, enabling the scientist to conduct further studies of the subject when required. During initial coding, the goal is to be open to all possible theoretic directions (Charmaz, 2014:114).

The second phase of coding is *focused coding*. In this phase the scientist selects "the most significant or frequent initial codes to sort, synthesize integrate, and organize large amounts of data" (Charmaz, 2014:113). These codes are tested on a large sum of data in order to test their significance. An important aspect is that they are apparent in the initial codes. They should always be based on the initial codes and expand upon those codes the researcher wishes to pursue (Charmaz, 2014:138).

Theoretical coding is the third (and optional) phase. It is used to develop theory from focused coding (Charmaz, 2014:150). Theoretical codes "are meant to be integrative; they lend form to the focused codes you have collected" (Charmaz, 2014:150). As Charmaz points out, "theoretical codes not only conceptualize how your substantive codes are related, but also may move your analytic story in a theoretical direction" (Charmaz, 2014:150). The theoretical codes utilized in this master thesis are the application of the actor-network-theory and boundary object to the data material. Their relevance emerged towards the end of this study. I will go into greater detail on why these conceptualizations became relevant in chapter 2.4, and a further discussion of these concepts in chapter 3.

Coding has played a big role in this study, guiding not only the results, but also the acquiring of new data. In the next sub-chapter, I will present and elaborate on the data collection tools I have utilized throughout this study.

2.3 Data collection

In this study, I use numerous sources of data. The data has been acquired through both accidental and theoretical reasons. I will not discuss the method for collecting YouTube-videos, webpages, Twitter-profile data etc., as I believe it is self-explanatory (I.e. google, key-

words etc.). I will, however, discuss how I conducted the interviews as the method for collecting interview information to a large degree depend on the instrument utilized.

For this thesis, the data collected has included qualitative data from:

- Interviews
- E-mail interviews
- YouTube-videos
- Blog-posts
- Webpages
- Documents

And quantitative data from:

- The Twitter-shark profiles
- the location data from the Global Shark Tracker.

2.3.1 Interviews

I have conducted three interviews throughout this research process. These have been unstructured and structured. Unstructured interview refers to interviews which do not revolve around questions, but rather is informant-focused (Hay, I. 2016:160). I utilized this interview form while interviewing zoologist and museum curator Petter Bøckman, due to his expert-role on communication of animals and nature. My goal was to learn what he thought was important in these settings, not to test my own hypotheses. The unstructured interview form enabled me to do this, with a focus on his accounts instead of answers to specific questions.

The second interview form, structured, refer to interview-settings in which the researcher employs an interview guide, with "exactly the same questions in exactly the same order" to each informant (Hay, I. 2016:158). I utilized this interview form on two occasions through *e-mail* with Rob Landers and Jim Ware, due to the availability and distance between me and the informants. The choice of a structured format, instead of a semi-structured format, was that an e-mail interview has certain limitations. For example, not allowing me to intervene or ask follow-up questions easily. I thus needed to gain the information needed without being able to interfere in the interview process outside of the interview guide.

The sources that I used were selected due to their expert-knowledge. As such, these interviews must be considered elite-interviews. However, as Smith (2005) argues, it is not apparent that elite interviews offer different challenges than normal interviews. The light I understand my interviews in, is that they have agreed to answer the questions in the way laid forward by me. A more valid question is thus my neutrality in the usage of a structured interview format, and my ethical conduct. When I asked for an interview, the informants were able to decline my proposition and ask for anonymity. I have also been sensitive towards the contexts in which these answers were given, and explicitly state where I am interpreting their statements.

The interviews will be referred to in the following ways:

(Interview with Rob Landers)

(Interview with Jim Ware)

(Interview with Petter Bøckman)

2.4 The research process

The research process started with an explorative research design – or rather, the discovery that I needed an explorative research design. After searching for relevant literature on "Tweeting sharks" and "OCEARCH" on Google Scholar and Oria, I found no literature bar a letter mentioning the tweeting sharks in a passing sentence. The closest I came was literature detailing the creation of an algorithm for blog-communication of birds in Scotland, yet this was not applicable to a study of the tweeting sharks.

The discovery that there was no research on the effects of communicating wild animals with tagging-technologies in social media, made it impossible to find a fitting template for studying this phenomenon. This claim was further substantiated through the Ambio issue on Digital Conservation, which explicitly stated that there was a lack of empirical studies in the field (Van der Wal & Arts (eds.), 2015).

The first I did was to use an explorative research approach to this phenomenon. What was the phenomenon tweeting sharks? I started this exploration by investigating the website www.ocearch.org, the various shark Twitter-profiles, and key-words such as "tweeting

shark", "OCEARCH", "Mary Lee the shark" and "Katharine the shark" on google. I was fortunate enough to find blog posts written by the creators of the two first tweeting sharks' Twitter-profiles which explained why they created the Twitter profiles and several blog-posts and news articles detailing OCEARCH's tagging-process, including the tagging of specific sharks. However, I also came across sources which stated different views over this context. OCEARCH's work is not uncontroversial, and other actors are attempting to diminish their legitimacy as conservational actors (see, for example White Shark Video, n.d.).

The amount of data available from several sources made it apparent that the sharks must have been quite successful in spreading awareness, not only on Twitter, but also news channels. The link between the Twitter-profiles of the sharks and OCEARCH was impossible to ignore, as they were mentioned simultaneously in most news articles (See, for example, Dan Radel, 2017), and hyper-linked between OCEARCH and several Twitter-profiles (see https://twitter.com/OCEARCH/lists/the-sharks for the full list of Twitter-profiles). Why did they become successful?

In order to learn more about their success, I contacted the zoologist and museum curator Petter Bøckman. I approached him by phone first, and later had an *informal interview* and a guided tour around the Natural History Museum in Oslo in order to learn more about communication of animals. A concept that was illuminated as important was emotional resonance, i.e. promoting an emotional bond with the animal and the audience (Interview with Petter Bøckman). In other words, communication of animals does not generative emotional resonance by just being informative, it must also generate an emotional impact in its audience. How are these tweeting sharks able to generate emotional resonance in their audience?

I analyzed several different web-pages, YouTube-videos, OCEARCH's web-page and the Twitter-profiles, scouring for information on how the tweeting sharks generated emotional resonance. This constituted the *initial coding* phase. My approach towards data-collection within this phase was a combination of both *accidental* and *theoretical sampling*. Accidental, since not all information is published online. Theoretical, as they helped me understand the environment surrounding the tweeting sharks.

After analyzing this information, I understood that there is a multitude of processes that contribute towards emotional resonance. Through my initial coding, I categorized three processes which *appeared* to be important parts of the tweeting sharks.

The processes of importance within this infrastructure was OCEARCHs work for conservation of sharks in general, their specific expeditions leading to location data on The Global Shark Tracker, and the creation of the Twitter-profiles for tweeting sharks. The link between these processes was not something I interpreted, but something that was highlighted in the sources I read. In an USA Today article, for example, "OCEARCH", "Twitter", "Tagged" and "Shark Tracker" all appear (Dan Radel, 2017). This correlation is one of many examples I found throughout the study. As such, I used these areas as focus areas for study.

Within the next phase, *focused coding*, I investigated the relations between the data material, which included interviewing the creators of Katharine and Mary Lee's Twitter-profiles, Rob Landers and Jim Ware (Interview with Rob Landers; Interview with Jim Ware). The reason for these *structured interviews* was to gain more understanding of relevant topics in which I lacked insight. I also checked out different sources, including Kickstarter and Rally.org. These sources of data material were also part of my usage of *constant comparative methods*. I had to question my own interpretation and the information provided by different sources at multiple points during this process. This was the case, for example, when I found out that Mary Lee and Katharine became part of OCEARCHs Kickstarter-campaign, a usage I interpreted as a conflict towards a separation of OCEARCH and the Twitter-profiles, a harmony presented in other sources. This lead me to re-interpret the data material and starting an analysis of the power-relationship between the various actors.

The final phase, *theoretical coding*, emerged when I connected my findings to the concerns within the field of digital conservation. When I realized that legitimacy was an important issue within the conservation movement, I needed a framework that allowed me to understand the dynamics between the different processes, actors and conflicting agency. This lead to the application of the actor-network-theory to analyze how the actors worked within each of the previously mentioned processes. By understanding these as translation processes, it allowed me to focus on how these networks were built.

However, solely applying actor-network-theory did not help me to analyze the distinctions between these translation processes. I thus applied the concept of boundary object to the instruments that allowed one translation process to connect to another.

The utilization of actor-network-theory and boundary object can be understood as the final phase of my analysis. It emerged as relevant because of its ability to open the different

mechanisms within and between the networks I have found to be important in answering my research question. They are fruitful in opening the "black-boxing" of a series of events which creates the tweeting sharks and give them the necessary foundation for being perceived as legitimate. In the next chapter, I will discuss these concepts in great detail, and why they have been important within the analysis of the tweeting sharks.

3 Analytical approach

As mentioned earlier, the analytical concepts I utilize in this master thesis emerged as relevant from my coding of the data material. The utilization of these analytical concepts is as much an analysis of my findings as the result from previous coding during my methodological approach.

The inclusion of *actor-network-theory* was a result of the connection between the data material and digital conservation. I found that it relevant to map out the actors' relationship and how they went through the process of creating the tweeting sharks. I did this in order to provide insights into how the tweeting sharks became transformative actors in conservation. The actor-network-theory was a fruitful approach towards analyzing the relation between the actors in each translation process, allowing me to analyze how legitimacy could be achieved for this emergent actor.

I noticed, however, that limiting tweeting sharks toward one translation process was insufficient to explain this phenomenon. The various processes contain different actor-compositions, which currently is, and as I will argue, should be kept separate. I thus utilized the conceptualization of *boundary objects* to better understand how these processes were connected.

In the following sub-chapters, I will give a detailed presentation of the analytical concepts I have used throughout this study, and the relevancy of these conceptual tools in analyzing the tweeting sharks.

3.1 Actor-network theory and boundary object

The tweeting sharks consist of different processes and various actors with different agencies that are bound together by different modes of communication. My analysis of the process leading to the creation of the tweeting sharks had to consider *how* the various actors try to shape this phenomenon through their agency across different processes, now and in the future. In other words, the *context* and *network* became an important element in the investigation of the tweeting sharks.

Star and Griesemer (1989) pointed towards the heterogeneity involved in most scientific work in their 1989-article. By using the Museum of Vertebrate Zoology at the University of California, Berkeley's history as an example, they showcased how various social worlds intersected in the creation of new knowledge (Star & Griesemer, 1989). This included amateurs, professionals, animals, functionaries and visionaries (Star & Griesemer, 1989:387).

A main point they argued was that actors have different aims and cannot be said to be unified under one common interest. Rather, "unless they use coercion, each translator must maintain the integrity of the interests of the other audiences in order to retain them as allies" (Star & Griesemer, 1989:389). As such, an integral part of this analysis has been to understand the limits of a translation process. In the creation of tweeting sharks, this aspect is of vital importance. I previously argued that we cannot be sure on the claims of legitimacy made by an actor without analyzing how this legitimacy is construed. It is my belief that one ought to analyze if one's claim to legitimacy is valid. That is, can we be certain that the actor represents what the actor is saying it is representing. Whose interest is being pursued? Is it OCEARCH's, it's sponsors, the shark's or the general public's? Is it all of them, or a selected few?

In the following sub-chapters I will describe and discuss the relevancy of the framework that I use to analyze how 'sharks' become 'tweeting sharks' and how various interests influence these tweeting sharks.

3.1.1 Actor-network-theory

> "Alas, the historical name is "actor-network-theory", a name that is so awkward, so confusing, so meaningless that it deserves to be kept" (Latour, 2005:9).

As Latour points out, the name "actor-network-theory" is confusing. It can be traced back to three documents, when non-human entities became "social compatible" (Latour, 2005:10).

Actor-network-theory stands in "opposition" to traditional sociology. According to Latour, traditional sociology views the social as distinct from, but encompassing, other fields of study, for example biology, medicine, physics etc. In this perspective, the social is *what* glues other fields into a coherent whole. The social precedes other fields of study, determining what can and cannot be done (Latour, 2005).

However, in the alternative view of actor-network-theory, the social "is *what* is glued together by many *other* types of connectors" (Latour, 2005:5). The social is an outcome from associations between non-social entities like biology, medicine, physics etc. (Latour, 2005). As Law argues, this is not specific for science but for all types of institutions (Law, 1992). In other words, actor-network-theory is not only relevant for the study of a scientific enterprise.

It is the outcome of associations that is important to note, as the social is "visible only in the traces it leaves (under trials) when a *new* association is being produced between elements which themselves are in no way 'social'" (Latour, 2005:8).

In a non-changing world, actor-network-theory would thus not be relevant. However, with a traditional sociology form of the social, "as soon as things accelerate, innovations proliferate, and entities are multiplied, one then has an absolutist framework generating data that becomes hopelessly messed up" (Latour, 2005:12).

It is its relevance in the creation of *new* associations that make actor-network-theory an interesting approach. When a situation suddenly changes, from one state into another. From one view of reality into another. As I've already discussed in detail, both human and non-human actors have transformative effects. They can change a situation, from one state into another. The fruitfulness of the actor-network-theory emerges when older theories are not sufficient to explain what has or is occurring (Latour, 2005). It is in this position I find the tweeting sharks.

The tweeting sharks are not just Twitter-profiles, not just tagged sharks, not just an entanglement of the old. Rather, they are a new association between actors that has not previously been linked together. They are the onset of the confusing *new*, which cannot be explained sufficiently by the old.

Actor-network-theory's focus on the *new* makes it more of an analytical approach than a theory. It does not explain this confusing "new". Rather, it guides searches which can illuminate the new. As Latour states: "It is no longer enough to limit actors to the role of informers offering cases of some well-known types. You have to grant them back the ability to make up their own theories of what the social is made of" (Latour, 2005:11).

Rather than providing hypotheses for a cause and effect, actor-network-theory focuses on the study of emerging relationships in the creation of the new. It is not up to the scientist to

hypothesize the new by using the old, but rather to "follow the actor" and let them show how they have made the new possible (Latour, 2005:12). In Latour's own words: "If the sociology of the social works fine with what has been already assembled, it does not work so well to collect anew the participants in what is not—not yet—a sort of social realm" (Latour, 2015:12). In other words, we need to define the 'new' by leveraging the expertise of those creating it.

Actor-network-theory has been useful for following the actors within the process of creating the tweeting sharks. The tweeting sharks consist of several different actors with different agencies. They are not representative of real sharks, nor are they only fiction. They are not pure human constructs, nor are they pure technological or biological creatures. They are a hybrid in several ways – making it difficult to pinpoint 'exactly' what they represent. Placing the tweeting sharks in prior categories does them no justice, as these labels carry associations towards concepts developed for different purposes. As such, I have utilized the actor-network-theory as a framework to leverage the position of those who make up this infrastructure surrounding 'tweeting sharks'.

In order to understand actor-network-theory it is important to look closer at the role of the relevant 'actor'. As Latour points out, there is a great deal of difference between an *intermediary* and a *mediator* (Latour, 2005:39). An intermediary, according to Latour, transport meaning without transforming it, whereas a mediator transforms the meaning it transports (Latour, 2005:39). In other words, the mediators are the relevant actors that impacts a process. Since the mediators impact the process, the outcome of a process may vary from the old. Mediators are thus unpredictable, and must be understood through their specificity (Latour, 2005:39).

The mediator is not only limited to human actors. Animals, machines etc. can also be mediators, transforming the output of the process (Latour, 2005). Latour's usage of mediator is akin to my usage of transformative effects. However, whereas mediation is a (somewhat) neutral signifier, my usage of transformative effects can be conceived of as the effective output of the transformation. Whereas a conventional bomb can transform a situation, a nuclear bomb can too, but with greater effect.

The different tweeting sharks can have different transformative effects on conservation. This is apparent, for example, with Mary Lee. Her number of Twitter-followers is much higher

than all the other tweeting sharks, which I would argue is a signifier for her being a more "impactful" tweeting shark. I will return to this point during my analysis of the tweeting sharks. My reason for pointing this out is that transformative actors matter, not just for enacting transformations but also the impact of this transformation.

This leads me to the key-word *transformation*. It changes the fabric of what 'was' and what 'is'. An example Latour and Woolgar uses in the book 'Laboratory Life' is that of *inscription* and *inscription devices* (Latour, & Woolgar, 1986). Inscription refer to the writing into text, whereas an inscription device is the device that enables the scientist to do so (Latour & Woolgar, 1986). An inscription can be understood as a transformation. The material changes from one state of being into another. From, for example, a soil-sample to a diagram of soil components (Latour & Woolgar, 1986). In this example, the device co-acted with the scientist and the soil-sample. They were all mediators within this context. The machine enabled the scientist to conduct the transformation, the scientist moved the soil-sample in the machine, and the soil-sample was responsible for what sort of information could appear on this diagram of soil components. This transformation into a new association could only happen due to organization of the context in which it was done.

The tweeting sharks is a transformation that came from emerging associations between several actors. It was an outcome only made possible because of the emerging organization of the network. This transformation, done by mediators, went through what Callon calls a process of translation (Callon, 1986). Translation, according to Callon, is a process "during which the identity of actors, the possibility of interaction, and the margins of manoeuvre are negotiated and delimited" (Callon, 1986:68). It "is the mechanism by which the social and natural worlds progressively take form" (Callon, 1986:81). The precise meaning of the terms 'translation' and 'transformation' is ambiguous, where the two concepts are seemingly used interchangeable. In this study, I do, however, separate the two. The definition used throughout this study is that *transformation* refer to the output – i.e. the end-product, whereas *translation* is the process which make this transformation possible.

According to Callon, one of the moments done by the initiators of the process of translation is to formulate questions and designate roles to relevant actors (Callon, 1986:69). This is what Callon refer to as "problematization" (Callon, 1986:69). This is a double movement, where they in addition to formulating the problems they wish to solve also define whom these

problems concern. By so doing, the "main" actors become an *obligatory passing point*, determining what should be done and who shall do it (Callon, 1986:69).

However, this does not mean that the various actors involved agree to the problematization. They might very well oppose such a problematization. Thus the "main" actors must develop an appealing problematization for the various actors involved. They do so by *interessement*, that is to appeal towards the needs and wants of the various actors involved. Interessement might be done by any number of devices, where the goal is to ally towards finding a solution to a problem (Callon, 1986:74). Successful interessement leads to enrollment. Enrollment in this case referring to the designated roles in solving a problem (Callon, 1986:74). Whereas interessement has as its goal to make actors interested, enrollment is agreeing to contribute towards solving the problem. In my analysis, I will illuminate how this happened in the creation of the tweeting sharks.

The last point I want to elaborate is that of representation. Who are to represent these actors, which might contain any number of individual actors sharing the same group-identification? Callon raises this question when referring to the negotiations that occur within the various actors that represent one group, for example "fishermen" or "scallops" (Callon, 1986:76). Are representatives to be decided by voting, random chance, or other means of selection? As he points out, only the few larvae that is successfully enrolled end up representing the countless that evades captivity (Callon, 1986:76). The notion of representation is an important dimension of the tweeting sharks, which I will elaborate on during the analysis.

To summarize, actor-network-theory is suited to analyze that which is new. It is more of an analytical framework for analyzing new phenomena. Within the actor-network-theory 'we follow the actor', understanding that creation of the new require a disruption of previous associations to create new ones. These associations are made through a translation process, where earlier associations are transformed through the passage of mediators, whether human or non-human. Mediators, in turn, are enrolled into the process by "main" actors that wish to solve a problem. In order to enroll these mediators, the "main" actors must create an appealing reason for the mediators to be involved in this process.

There is a reason why I have chosen to use the term "main" actors in this description. It is not so straight-forward to designate a *main actor* in all projects. As I discovered in my investigation of the tweeting sharks, there are three actors (discussed in chapter 4) that can be

considered as an obligatory passage point: OCEARCH, M/V OCEARCHs crew and the Twitter-profile creators. These actors appear to be located within different translation processes, and as I will argue, *need* to be located within different translation processes. The difficulty of understanding a process through one main actor is one of the factors critiqued in the concept of "boundary object" (Star & Griesemer, 1989).

3.1.2 Boundary Object

As Star and Griesemer point out, it is not so that only one actor tries to conduct translations. In reality, all actors try to conduct translations simultaneously (Star, & Griesemer, 1989:389). Administrators, researchers, amateurs, animals, machines all have different interests outside of a given project. It is thus more accurate to include the institutional setting, rather than reducing it to a single project (Star & Griesemer, 1989:390). This is not to say that the project setting is not important, but rather that it does not exist in a vacuum.

In practice, this entails that there is not *one* obligatory passing point, but *many* (Star & Griesemer, 1989:390). Since the project does not exist in a vacuum, it will have conflicts not only with enrolling other actors, but also to avoid being enrolled by other projects. The main goal then, "becomes to defend it against other translations threatening to displace it" (Star & Griesemer, 1989:391). An example of this might be the need to get funding, which requires one set of actors to persuade another set of actors that the project is worth pursuing. While there might be good reasons for securing funding, this funding might be followed by some caveats. It might be that the other set of actors try to *change* the project, aligning more to their goals than what was originally proposed. Actors are therefore acting within a *dialectic* framework, where actors must cooperate on equal grounds, instead of being sub-actors for a "mighty" principal (Star & Griesemer, 1989:392).

I have contextualized this within my study of the tweeting sharks. Instead of understanding the tweeting sharks through a single translation process, I have looked at this phenomenon as an institutional context. In this institutional context are actors with different agencies working within different translations. Tweeting sharks, in my interpretation, is therefore the overarching phenomenon which link these translation processes together.

The institutional setting leads Star and Griesemer to the concept of "boundary objects" (Star & Griesemer, 1989:408). Boundary objects are objects that negotiate the cooperation between

actors. They are produced when various actors collaborate to produce means of representing nature (Star & Griesemer, 1989:408). Due to the intended purpose of boundary object, that is to facilitate cooperation, boundary objects need to be "simultaneously concrete and abstract, specific and general, conventionalized and customized" (Star & Griesemer, 1989:408). It is based upon principles that all actors can agree on, and which takes into consideration the various needs of each actor (Star & Griesemer, 1989:408).

Within tweeting sharks, I identified two boundary objects which link the three translation processes together: M/V OCEARCH and The Global Shark Tracker. I will elaborate more on these during the analysis.

There are many types of boundary objects. In Star and Griesemer's article, four is mentioned as demarcations for analytical purposes. These are "repositories", "ideal types", "coincident boundaries" and "standardized forms" (Star & Griesemer, 1989:410).

Repositories are "ordered 'piles' of objects which are indexed in a standardized fashion" (Star & Griesemer, 1989:410). Ideal types are abstract projections which do not accurately describe local objects but are vague enough to be adapted locally (Star & Griesemer, 1989:410). Coincident boundaries are "common objects which have the same boundaries but different internal content" (Star & Griesemer, 1989:410). Standardized forms are "boundary objects devised as methods of common communication across dispersed work groups" (Star & Griesemer, 1989:411).

In this chapter, I have discussed actor-network-theory and boundary objects. These have been included in the final step of my analysis, theoretical coding, of the tweeting sharks. With these analytical perspectives, I have been able to identify three translation processes and two boundary objects which together illuminate the *mediators* and their modes of cooperation Together they make up the structure of the tweeting sharks.

As I will show, there are many independent actors that were able to cooperate non-intentionally and intentionally to create these tweeting sharks. However, this cooperation is also under threat. As I will argue, the separation of these translation processes is important to ensure the legitimacy of these tweeting sharks.

4 What is a tweeting shark?

As presented earlier, my research question is:

How do the tweeting sharks achieve transformative effects in the network of conservation?

This chapter will illuminate the structure that makes these transformative effects possible. I will in this chapter present the results from my study, as well as connect the results with the analytical framework presented. By so doing, I illuminate the structure of the tweeting sharks. The chapter is organized chronologically, whereby I investigate the three different translation processes and how they are connected through boundary objects. During this analysis, I will also investigate how the validity of tweeting sharks is constructed, and how the belief of legitimacy is construed.

As mentioned, the tweeting sharks consist of much more than Twitter-profiles. The term itself, "tweeting sharks", is an interesting title used in several news stories surrounding another related phenomenon (see, for example, O'Neil, 2014). It originated as a term for describing sharks whose tagging-technology is programmed to tweet once the sharks hit Australian coastlines. While these sharks only post their tagging data, I would argue the term also captures the essence of the tweeting sharks within the context of this study. The term tweeting sharks, I would argue, is a class in which variations can occur. In my usage of this term, I refer to various sharks that have their own Twitter-profile and write tweets from their "own" perspective.

These Twitter-profiles are in reality narrated by people that give a "voice" to the sharks, making them entertaining and promoting conservation at the same time. Yet, understanding this phenomenon as a Twitter-profile narrated by a person does them no justice. The sharks, on which the twitter-profiles are based, have real agency in the narrative that is put forward. They are not just an entertaining, conservation-promoting "object".

I have identified three translation processes that occurs in the creation of a tweeting shark. These are: *Getting scientists closer to sharks*, *the transformation of sharks* and *the tweeting sharks*. The three translation processes are what makes up the infrastructure of the tweeting

sharks. It is a structure that simultaneously construct validity, construe legitimacy and gain transformative capability in what constitutes nature and nature conservation.

I will analyze each of these translation processes as well as the link between them. While the presentation of these translation processes is *chronological*, I want to point out that these are dialectic and influence each other.

4.1 Translation process 1: Getting scientists closer to sharks

The starting point of the first chapter is to look at the translation process that *enabled* the following translation processes to occur. I want to point out that this process does not occur in a vacuum. The following translation processes also influence the one I discuss in this chapter. However, this is a fitting starting point, as it was the translation process that rendered the other ones possible.

Every story has its own backstory, and the origin of tweeting sharks is no different. To understand how 'tweeting sharks' was created, it is important to note the amount of effort that was required to achieve this feat. In this chapter, I will "follow the main actor", looking at how OCEARCH was conceived and generate support for their expeditions (the next translation process).

The initiator of this translation process is Chris Fischer, and the non-profit organization he founded – OCEARCH (OCEARCH, n.d.-a). OCEARCH was an outcome of a situation that occurred during the TV-show career by its founder Chris Fischer (Clemens, 2015). The starting point of this process was a TV-series Chris Fischer hosted for ESPN, called "Offshore Adventures". The TV-show lasted for 180-episodes, and its success made Chris Fischer win an Emmy-award, testament to the show's popularity (Clemens, 2015).

The success of "Offshore Adventures" is an important aspect for understanding how OCEARCH came to be, as it got Chris Fischer appointed to the board of the "billfish association", an association dedicated to billfish conservation (Clemens, 2015). After getting more acquainted with marine animal conservation through this association, Chris learned that "The full-time people on the water, the captains and the mates, oftentimes knew more about what was going on with specific types of fish than the PhDs did." (Clemens, 2015). Chris

Fischer thus started bringing scientists, fishermen, captains and mates together in his tv-shoots, combining practical and theoretical knowledge during his trips (Clemens, 2015).

It was during a shoot for the TV-series in 2007 where Fischer got a “reality check” from one of the scientists that accompanied them on their trip. He stated the importance of this “reality check” in an interview with Discovery: "while we were helping these scientists, one of them looked at me and said, 'Man, if we lose our giant sharks, we're not gonna have any billfish or tuna or anything else because they're the balance keepers and we don't know enough about their lives to create their future. They're just too big to catch'" (Clemens, 2015). This was the key event leading to Chris Fischer’s decision to found OCEARCH (Clemens, 2015).

Chris Fischer and his wife spent their life savings to buy the decommissioned Bering Sea crabbing vessel “M/V OCEARCH” and founding OCEARCH (Clemens, 2015). Their goal was to enable scientists to study sharks up close in order to help conservation efforts of shark populations (Clemens, 2015). Their vessel, M/V OCEARCH was customized to fit a custom 75,000-pound hydraulic lift and an at-sea laboratory, making it a unique vehicle for scientific studies of sharks, and viable for their goal (Annear, 2013).

As this prelude show, OCEARCH’s foundation is directly linked to Chris Fischer’s television-career. Without it, OCEARCH may never have been founded. This prelude is also the starting point that eventually lead to the creation of ‘tweeting sharks’. And as such, a necessary component for understand the translation processes.

In the prelude, two things happen that I think are especially important to note for this translation process. The first thing is that Chris Fischer and OCEARCH made a problematization – “how can we help scientists get closer to sharks?”. Within this problematization, the roles of the actors were clearly defined. OCEARCH became the enabler in this network, granting the necessary means for scientists to get closer to sharks. Scientists got a role of scientific expertise, responsible for conducting studies. And the shark became the *object* which OCEARCH wanted to conserve.

The initial network can thus be described as OCEARCH and scientists cooperating to conduct studies to better help the conservation of the sharks. OCEARCH placed itself as an *obligatory passage point* within this network. Without them, the scientists would have had no other

option of getting close to the sharks. It was thus no symmetrical power relationship, but an asymmetrical one.

As I mentioned in my analytical approach, the main actor needs to enroll other actors. Being the main actor in an asymmetrical power structure, OCEARCH thus needed to make scientists willing to participate through *interessement*. They provided good reason to do so, considering the possibility of either conducting studies or not conducting studies. Later, OCEARCH also generated other means of interessement. This will be elaborated more in chapter 4.2.

By utilizing the M/V OCEARCH, OCEARCH has currently conducted around 30 expeditions together with scientists since OCEARCH's inception in 2007 (Tolliver, 2017). More than 50 research papers have been, or is in the process of being, published through OCEARCH-facilitated data collection, with one expedition in particular - the Galapagos-expedition - having measurable impact on legislation (OCEARCH, n.d.-a).

However, this prelude does not explain *how* OCEARCH is able to conduct its expeditions. After all, OCEARCH requires funding and generation of awareness to be able to achieve the means necessary to conduct their mission. In the following sub-chapters, I will illuminate *how* OCEARCH enroll various actors into participating in their mission.

4.1.1 OCEARCH's organizational structure

OCEARCH is organized in order to *facilitate* scientific studies (OCEARCH, n.d.-c). The organization is led by Chris Fischer, founding chairman and expedition leader in OCEARCH (OCEARCH, n.d.-a). OCEARCH also have five additional crew members filling the functions of "Fishing master/Captain", "Chief Operating Officer", "PR/Communications & Education Coordinator", "First Mate" and "Vessel Operations Manager" (OCEARCH, n.d.-a).

The list of crew members reflects Chris Fischer's notion that I presented earlier – that the captains and the mates are important in marine observations - as only one of the six crew members has a background from marine-biology studies (OCEARCH, n.d.-a). As OCEARCH states on their website, they are *enabling* science to be done (OCEARCH, n.d.-c). Their explicit notion of "crew", instead of "employees" or "scientists", further emphasizes OCEARCH's role as tailored towards operation of a marine vessel.

OCEARCH should thus not be confused with scientists, but rather as a *facilitator* for science. They enable scientists to study sharks by usage of the vessel M/V OCEARCH, as well as capturing, handling and tagging great sharks (OCEARCH, n.d.-c). During a 15-minute window, scientists can conduct experiments which entail, among other things, a collection of samples which are used as data material in their studies (OCEARCH, n.d.-c). M/V OCEARCH is thus two things simultaneously. It is a transformative actor, in that it renders what was impossible, possible. However, it is also a boundary object. It is not just an enticing interessement, but an actual form of cooperation – both abstract and material. M/V OCEARCH is a method, so to speak, that is vague enough to allow different kinds of experiments to occur, yet solid enough to provide structure for how the cooperation should be. It embodies a rule-set of conduct. A scientist knows that there is only a 15-minute window, and consent to this mode of cooperation by participating. This allows OCEARCH to follow their goal, but also allows the scientists to follow their own goal, independently from the perspective of OCEARCH. As OCEARCH states, the only requirement is that they publish an academic paper (OCEARCH, n.d.-c).

OCEARCH's modus operandi is therefore to grant scientists access to their equipment for, and expertise in, getting close with great sharks. In other words, they create interessement for the scientists to *enroll* in their project. Yet, this interest is not only local to OCEARCH's mission. Through cooperation both parties can further their own goals simultaneously. OCEARCHs structure as a facilitator also legitimizes their mission. They are not the ones that conduct the studies, and as long as one agree that science is important, OCEARCH can act as a legitimate actor in providing help for the scientists.

OCEARCH have, according to their website, partnered with 157 researchers from 83 regional and international institutions (OCEARCH, n.d.-a), stating the name and institution for several of the scientists on their homepage (OCEARCH, n.d.-c).

As the quote OCEARCH provide from Dr. Bob Hueter illustrate, "OCEARCH brings a capacity to shark research unlike anything we have ever had before. We have never had a ship like this, never had a crew like this — the expertise — it's amazing" (OCEARCH, n.d.-c). I see no reason for doubting this claim, as OCEARCH's expedition usually enroll between 10 and 13 scientists for each expedition (OCEARCH, n.d.-c). It thus appears that OCEARCH's utilization of M/V OCEARCH has been successful as an interessement device and as a cooperative tool.

However, the enrollment of scientists is not the only relevant factor. As previously stated, OCEARCH also need to generate awareness and funding for its mission. In the next-sub-chapter I will detail how they enroll various actors to gain the necessary awareness and funding.

4.1.2 Generation of awareness and funding of OCEARCH

I have already highlighted that OCEARCHs main mission is to facilitate for scientific research. They do so by organizing expeditions which bring scientists closer to great sharks. This is not cheap, however, costing approximately 400.000 USD for a three-week expedition (Tolliver, 2017). OCEARCH therefore need to achieve the necessary funding for conducting these expeditions.

They secure funding by generating awareness and enrolling partners for support. As I mentioned earlier, Chris Fischer became famous for his tv-series "Offshore Adventures", winning him an Emmy-award. This has undoubtedly contributed to spreading awareness of OCEARCH and its mission, both due to his fame and the network he created during the tv-series. He is the "front-figure", being featured in a number of news articles (Tolliver, 2017). They also leverage television and social media in their outreach to create awareness of OCEARCH (Tolliver, 2017).

As Chris Fischer points out in an interview with The Virginian-Pilot: "At first we leveraged television," he said. "Then we started to build an enterprise that created content and open-sourced all of the information. We work with socially responsible companies and have built the capacity for scientists to do research beyond what they have had in the past." (Tolliver, 2017).

In 2016 OCEARCH boast having had an outreach "on the Global Shark Tracker to 2.3 million users, achieved an annual global reach of more than 6 billion media impressions, a Facebook reach of 70 million impressions, and a Twitter reach of 134 million impressions" (OCEARCH, n.d.-a).

The social media presence is an interesting aspect of OCEARCH. It could be looked at as a great virtual witnessing technology. Through the usage of social media, OCEARCH create *interessement* in the general public, appealing to their audience in stating that they can get

regular updates of their work by following them directly. Since 2016, they have even opened an expedition page on their website that contains frequently asked questions, pictures, biographies of (scientist) participants, information about the expedition and when the expedition will take place (OCEARCH, n.d.-c). It might even be understood as a standard, considering the similarity of template for each expedition. The boundary object which enables these expeditions to occur, M/V OCEARCH, can thus be witnessed through their website, in effect legitimizing the validity of these expeditions. By having learned that one expedition has occurred, and then another one etc. establishes this indirect witnessing technology as a legitimate source of information.

OCEARCH have, at the time of writing, a Facebook-page with 478.347 followers (https://www.facebook.com/OCEARCH), a Twitter-page with 88.692 followers (https://twitter.com/OCEARCH), an Instagram-page with 113.256 followers (https://www.instagram.com/ocearch/) and a YouTube-channel with 9892 subscribers (https://www.youtube.com/user/OCEARCH). These are not just social media channels, but virtual witnessing technologies documenting OCEARCHs work including their expeditions.

OCEARCH positions themselves as the *gate-keeper* of interesting information. They become an *obligatory passage point* for interesting information on shark conservation, their expeditions and an "in-field" perspective of what they do.

They use this outreach, partially, to generate funding from the visitors to their website. They have, for example, a "donate"-button in their bottom-text on their webpage, as well as a collaborative shop with Costa where it is possible to buy OCEARCH-themed merchandise for website visitors (OCEARCH, n.d.-d). They advocate the shop with "Each purchase helps fund research expeditions aboard OCEARCH and their mission to protect sharks" (Costa Del Mar, n.d.) and the donation page with "With your help, we can continue to be the leader in open source research, continue to educate the public to have a data-centrist disposition, advance science, and enable collaboration with professional mariners and world-class scientists" (OCEARCH, n.d.-b).

In addition, they have utilized Kickstarter, a crowd-funding service (OCEARCH, 2016a), and rally.org (OCEARCH, 2017a) to collect donations. While rally.org functions like a normal donation page – except with commentary-field integration -Kickstarter offered rewards for

donations through the “pledge”-system, including a shout-out from one of the tweeting sharks’ Mary Lee, Katharine or Lydia for pledges of 20 USD or more (OCEARCH, 2016a).

The donations share a common characteristic in this translation process, they generate *interessement* in that by contributing to OCEARCH (*the obligatory point of passage*), they enable a furthering of OCEARCH’s mission. Moreover, by virtual witnessing, the audience gain proof that OCEARCH is doing what they are saying they do.

Generation of awareness has also attracted several businesses to be affiliated with OCEARCH. They list SeaWorld, Costa, Yeti, Jacksonville University, Cisco Brewers Nantucket, Southern Tide, Jefferson’s, Landry’s, oneQube, Cat, Contender, Xavient Information Systems, KonectIDY, 13. Brooke Kanani, Shark Mate, Standard Horizon and LightHawk as organizational ‘partners’ at their web-page (OCEARCH, n.d.-a).

These partners contribute to OCEARCH in important ways, both outside and inside expeditions. OCEARCH have, for example, partnered with Costa to provide merchandise themed for OCEARCH, accessible on their web-page (Costa Del Mar, n.d.).

As Chris Fischer describes their partnership in an interview with The Virginian Pilot: “Costa is smart,” Fischer said. “If there are no fish in the ocean, nobody needs their glasses to go see fish. So they get involved with the fishing community and get behind research that will benefit the oceans” (Tolliver, 2017).

This is an example of how Chris Fisher create a *problematization* that designate OCEARCH as an *obligatory passing point* for the continuation of Costa’s business. In other words, he creates an *interessement* for Costa to *enroll* in OCEARCH’s project. Another example is the sponsorship with Cisco Brewers of Nantucket and Jefferson’s Ocean. The Virginian Pilot describe their partnership in the following way:

> “Ocearch is also funded by Cisco Brewers of Nantucket and its Shark Tracker Light Lager, and Jefferson’s Ocean: Aged at Sea bourbon. Each expedition carries four large barrels of the bourbon for its aging process. And if you have Ocearch’s Global Shark Tracker app on your phone, you can go to the “Bring to Life” setting, take a picture of the beer can and instantly watch a two-minute commercial about the beer company and its relationship with Ocearch“ (Tolliver, 2017).

In this case, OCEARCH positions itself as an *obligatory passage point* for a special product, i.e. the "Aged at Sea bourbon" and "Bring to Life".

The impact of these various sponsorships is described in The Virginian Pilot as: "branding is everywhere on board the boat. It looks like a NASCAR race car – plastered with banners, decals and logo clothing that promote sponsors" (Tolliver, 2017).

It is no coincidence that a big part of this translation process is the generation of awareness and funding. Generating sponsorships is essential for OCEARCH's goal – to conduct expeditions that bring scientists closer to sharks.

4.1.3 Summary

OCEARCH, as I have shown, places itself as an obligatory passage point in several ways. They control M/V OCEARCH, the transformative actor that grants access to what was previously inaccessible. Moreover, M/V OCEARCH become a boundary object, creating a standard for research practices (15-minutes) and for the indirect witnessing technology (validity for the audience). This allows for communication with both scientists and the audience through the generation of a standard for collaboration.

OCEARCH acts as an obligatory passage point for getting closer to the sharks with their unique vessel and expertise. They enroll the scientists, general public and sponsors by providing proof and enticing interessement-proposals and show themselves as legitimate by providing evidence that they can do what they claim, and that their goal is to support scientists in order to conserve sharks.

In the next sub-chapter, I will elaborate on the next translation process – the transformation of sharks into various forms of data.

4.2 Translation process 2: The transformation of sharks

This sub-chapter will revolve around the translation process, which takes place during an expedition. It is not a coincidence that I have separated this translation process from the previous one. Whereas the first emphasizes getting support for conducting an expedition, the

second is the conduction of the mission. If these were entangled to a great degree, the expeditions might be viewed as a furthering of generating support. The implication of this intermingle is not to be understated, as it might undermine the claim that OCEARCH are out to help with conservation measures of sharks. Some critics, for example, argue that OCEARCH is hurting sharks, rather than helping them (see, for example White Shark Video, n.d.). If this is in fact the case, one cannot say that the expeditions done by OCEARCH are legitimate from a conservation-perspective. Rather, they would have been exploiting nature to further capitalistic gains. I will not delve into these claims but rather showcase this discussion to illustrate the necessity of the separation between these two translation processes.

Before an expedition start, OCEARCH set an expedition goal, enroll scientists and sponsors and, since 2016, create an expedition-page on their website (OCEARCH, n.d.-c). A typical length of an expedition is two-three weeks, with two-four expeditions taking place each year (OCEARCH, n.d.-c).

The goal of each expedition typically range from furthering the understanding of the ecology, natural history, physiology, and behavior of marine species in a certain habitat (OCEARCH, 2016b), improving sample sizes (OCEARCH, 2017b) or to enhance understanding of results from earlier collected data (OCEARCH, 2017c). These are the *problematization* that is to be resolved through this translation process. Due to there being multiple goals, including tagging the sharks, I have named this translation process in a more abstract manner: *The transformation of sharks.*

Within this translation process, the goal is to transform sharks from an unknown into some form of monitorable data. This problematization also designates the roles of a new set of actors. In the role of main actor is OCEARCH. They have control over the resources required to conduct this transformation. With them is the scientists, responsible for conducting the experiments. The translation process takes place onboard the M/V OCEARCH, making it a transformative actor with its own agency. It provides limits as well as opportunities within this translation process. In this chapter, these three actors are grouped together as "OCEARCH crew". On the other side of OCEARCH crew, are the sharks. They are also *actors* within this translation process. Without them, the transformation of sharks cannot occur.

In this chapter, I will elaborate on the translation process which transforms a shark in its wild habitat into monitorable data. The chapter takes place after an expedition has started, and will cover the process of locating, capturing and tagging of the shark, as well as the database which stores the data – The Global Shark Tracker.

4.2.1 Tracking and fishing the sharks

As mentioned, M/V OCEARCH is a transformative actor as well as a boundary object. This vessel is what binds OCEARCH and the scientists to the possibility of conducting expeditions, and us as an audience to the possibility of virtually witnessing the expeditions. M/V OCEARCH is the link that connects translation process 1 with translation process 2.

After the expedition has started, and the OCEARCH crew has gotten to the targeted location they dispatch a smaller support boat, a "tender", and deploy a ROV (Remotely Operated Vehicle) that uses sonar to locate sharks that are dwelling near the ocean-floor. They utilize this, as well as their eyes, in scouting for sharks (OCEARCH, 2012c). The ROV has the benefit of letting the team know if there are sharks in the area, or if they are fishing in "empty water" (OCEARCH, 2012c).

This apparatus, consisting of the ROV and eyesight, require training to utilize. The ROV must be controlled and the sonar depictions interpreted (OCEARCH, 2012c). Similarly, eyes must be trained to spot the sharks, something which is difficult in open water (OCEARCH, 2012c). In other words, these apparatuses require *expertise* in handling. However, no amount of expertise can make sharks magically appear. This whole situation is dependent upon the sharks' agency – that they want to be in the area.

Sharks like to travel, which can easily be seen just by watching OCEARCH's Global Shark Tracker (OCEARCH, n.d.-d). There is no guarantee that they are in the US at all (where OCEARCH conducts most expeditions), they could instead be gathering in Africa. OCEARCH crew thus need to rely on the notion that sharks are where the sharks normally are. However, locating the sharks is still difficult. Even if the sharks were in the US, it is still a huge oceanic area with an enormous number of places to be.

Because of this, OCEARCH crew need to attract the sharks. They need to give the sharks compelling evidence that coming to the OCEARCH crew is worthwhile. To do this,

OCEARCH crew uses a technique called chumming (Tolliver, 2017b). 'Chum' is "bait usually consisting of oily fish ground up and scattered on the water" (Chum, n.d.). The technique, chumming, is the act of using 'chum' to "lure (fish) with such bait" (Chum, n.d.).

Chumming is a case of tricking the sharks, making them believe that they will get food if they approach the OCEARCH crew location. However, chumming does not always work. The sharks don't always want to be tricked. In the Jacksonville expedition, such a situation arose, requiring the utilization of *original* techniques to lure the shark in (Costa Sunglasses, 2013).

The sharks I have described, are in every sense an actor. They are not mere objects, accepting the OCEARCH crew's proposition due to cause and effect. It cannot be said that sharks are all the same, and that they all act in the same way. They are unpredictable beings. By rejecting the attempt to lure them in, sharks become negotiators. Unsatisfied with the proposal, OCEARCH crew is forced to reinvent their methods, creating more appealing offers to the sharks. The whole procedure can therefore be understood as a negotiation process, where the OCEARCH crew must adapt to the shark by the utilization of various techniques. In other words, attracting the shark is as much an *interessement*- and *enrollment* operation. This also has repercussions to the *representativity* of the sharks. Attracting a shark is an act of negotiation, and since this does not always work, representativity can only be achieved for the successful negotiations.

Once a shark is spotted, the gears are turned towards catching the shark. OCEARCH explains this process as: "Sharks are caught from tenders using handlines and are guided by hand in the water on and off the lift. After capture, sharks are brought to the submerged platform of the M/V OCEARCH vessel and the platform is raised. Once the sharks are restrained and hoses of water have been set to enable the flow of oxygen, they are measured. SPOT and acoustic tags are attached" (OCEARCH, 2017b).

However, this descriptive presentation makes it seem easier than it really is. OCEARCH describes their struggle vividly in their capture of "Mary Lee":

> Just like Genie, Mary Lee wouldn't take the bait. She became curious as time wore on and started with the same pattern as Genie by nudging at the Yamaha Outboards at the back of the boat, and continued to circle. Finally the call came in to the MV OCEARCH, "We're hooked up!"

> Mary Lee wasn't going to swim into that cradle without a fight. It was a long walk up the current before the attachment of the buoys could be attempted. With two buoys on they started toward the mother ship. The current was ripping at about two and a half to three knots. Suddenly Mary Lee rolled and chewed off one of her buoys. Left with only one buoy to keep her near the top of the water, they attempted to bring her in.
>
> As they approached, she dove and took a hard right to avoid the cradle causing the Contender to make a second pass once they had reattached a second buoy. Second time was the charm even as the battled the current. As Mary Lee made her way onto the lift her massive size became overwhelmingly apparent. With Juan at the controls, the lift was raised safely out of the water and Mary Lee was ready to be fitted with three different tags: SPOT, accelerometer and acoustic.
>
> In the midst of tagging, an attempt to get her blood was made. The current was just too strong to lower the cradle, but Dr. Greg Skomal had to at least give it a try. As Captain Jody Whitworth, Chief Engineer Denny Wagner and First Mate Todd Goggins began to assist, her tail began to thrash, knocking Denny to the ground, swiping Todd and nearly flinging Jody off the lift.
>
> Once calm, tissues samples were taken, parasites were gathered but the blood work had to be aborted. With time ticking, Mary Lee was lowered back into the surging current. Water hit her gills and she swung herself around on the lift. Captain Brett clung to the side as she charged out of the lift.
>
> Chris Fischer reflects on Mary Lee and the crusade to get Mary Lee in the lift, "The most brutal battle, we have ever had. Bret McBride, Jody Whitworth, Todd Goggins. True warriors in the midst of a modern day battle with an ocean giant in the toughest of environments we had ever had to work" (OCEARCH, 2012b)

As this story show, the negotiation process with the shark continues during and even after capture. This negotiation process doesn't always end well. As viewers of "Shark Wranglers" (a temporary show where viewers could watch their expeditions on TV) could watch plainly, the great white Maya died during this negotiation process (Duffy, 2012). Negotiations with sharks are not straight-forward processes. The actors do not always conform to the script so to speak, producing results that could be fatal. While it is enticing to believe that no bad thing can happen in animal conservation, the reality is quite different. However, the fact that I can

say this show the sincerity of this operation. One might say that it provides a convincing account through the usage of a virtual witnessing technology.

It is during this "battle" that the OCEARCH crew, among other things, tag the sharks with a SPOT-tag. This is also the first step towards creating a tweeting shark. In this translation process, the sharks go from a plural object to an individual actor. The focus changes from being representative of "sharks" to being a representative of "itself". In the next sub-chapter, I will elaborate on what happens after this "battle" between OCEARCH crew and the shark.

4.2.2 SPOT-tag and The Global Shark Tracker

While the OCEARCH crew does other things, such as collecting samples, I will only focus on the SPOT-tag and the following results in The Global Shark Tracker in this sub-chapter. SPOT stands for "Smart Position and Temperature" (Office of Marine Programs, n.d.) and is used by OCEARCH to send location data to their database via satellite (OCEARCH, n.d.-c). This tag is mounted a tag to the dorsal fin of the shark and provides up to five years of tracking (OCEARCH, n.d.-c).

The data collected by the SPOT-tag is sent to an Argos satellite, a consortium of several satellites' run by Collecte Localisation Satellite (CLS) which collects data (Argos CLS, 2015). In order for this data to be useful, "the SPOT-tag wet/dry switch needs to be dry for a minimum of 90 seconds during which 3 consecutive pings must occur to get an accurate geo-position" (OCEARCH, n.d.-a). This means that the shark must surface for a prolonged period, in order for an accurate geo-position to be measured.

The data is stored in the Argos satellite(s), and then relayed in real-time back to receiving stations on earth (Argos CLS, n.d.). There are nearly 70 such stations spread across the earth, which in turn send this data to processing centers (Argos CLS, n.d.). Once the data is processed in these centers, the location is calculated and made available to its users – which in this case is OCEARCH (Argos CLS, n.d.). This data then appears as "points" on The Global Shark Tracker.

Argos is its own network, consisting of other actors. They are not discussed in full in this master thesis, as the shark's tracking-data is just a fraction of the total data that Argos process. However, Argos is of importance to the tweeting sharks. I have described a massive

infrastructure, made by the efforts of several scientists from multiple countries, consisting of several highly advanced technologies. It may seem like the more familiar GPS, but is based on a different infrastructure, emphasizing collection and transmitting over giving data when prompted (Xerius, 2016). However, as I pointed out in the introduction, infrastructures can fail. For example, due to solar flares (England, 2017).

The infrastructure of Argus may be perceived as working because of our understanding of GPS, even though it is a different infrastructure. It may also be perceived as working, because we are used to Google Maps or other similar technologies working. However, this is not always the case, which is illuminated in relation to for example solar flares. The reason I point this out is not to go into a technical discussion, but to illuminate that our understanding is based upon the legitimacy of an infrastructure. We do not necessarily know that the information it provides is correct, but we *assume* that it is.

Through this process, The SPOT-tag – and its related infrastructure - acts as an inscription device, extrapolating data from the geographical location of the shark and convert it into readable figures on OCEARCH's interactive map – The Global Shark Tracker (OCEARCH, n.d.-d).

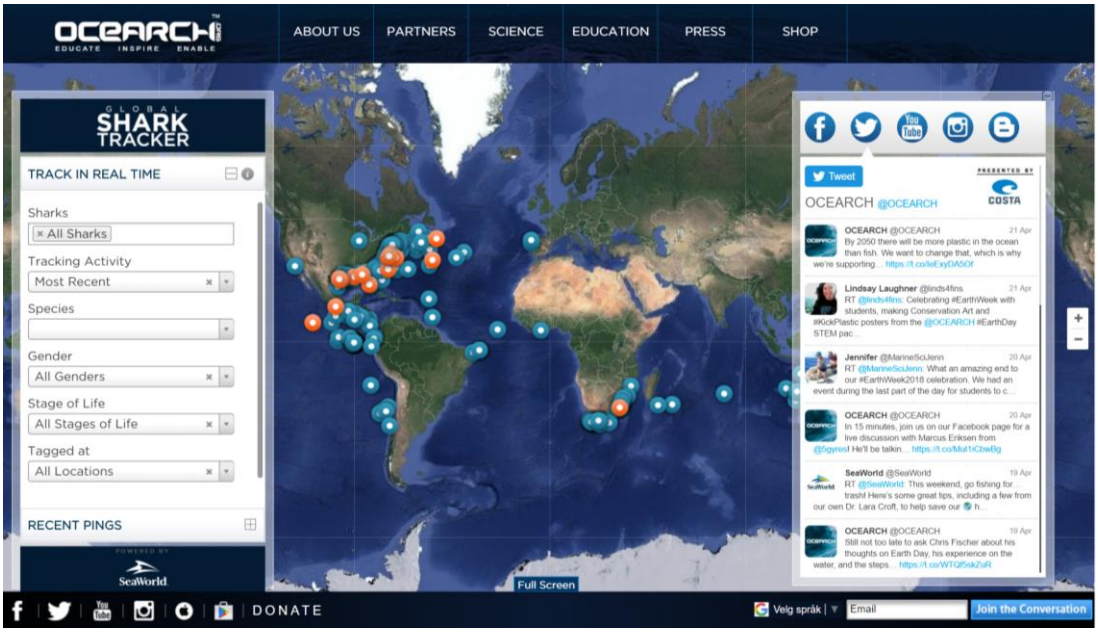
In the next chapter, I will elaborate more on what The Global Shark Tracker is, and what it allows the users to do.

4.2.3 The Global Shark Tracker

The Global Shark Tracker is an interactive map created by OCEARCH. It is the end-point of this translation, and the starting point for the translation process of the tweeting sharks.

After a data entry is created for the corresponding tagged shark, each 3 consecutive pings create a data point on the The Global Shark Tracker. Yet, how do we know that the shark referred to on this interactive map represents the shark? We cannot possibly know the validity of this claim unless we witness it directly. The photographs taken during the expeditions may be tampered with, and OCEARCH might even be plotting in the data points on the map themselves. I do not believe there is any reason to suspect these arguments to be true, but it illustrates that our belief is based upon *assumptions*.

We base our belief on what the direct witnesses state in interviews and self-reporting, together with compelling evidence from indirect witnessing technology. We also base our belief on our familiarity with the infrastructure surrounding tracking-technologies. It is not unknown to us. Most of us have tested GPS technology in one way or another. We might, for example, have learned from google maps that tracking data is trustworthy. These assumptions of the validity of what is being claimed form the basis for the *legitimacy* of The Global Shark Tracker. There is so much evidence that support the notion that the data points are valid, and the infrastructure and representation are familiar to us. The Global Shark Tracker, for example, has a striking resemblance to google maps.



Print screen from The Global Shark Tracker (OCEARCH, n.d.-d).

The Global Shark Tracker is the first thing you will notice when heading to OCEARCH's website – www.ocearch.org. It is open-sourced, allowing access to all interested parties. It is also a boundary object with vital importance for the creation of the Twitter-profiles.

As the picture shows, it is possible to search for all, or a specific, shark. The tracking activity can be adjusted to show singular pings or connected pings during specific time intervals. It is also possible to sort between specific species, genders, the life stage (age categories) of the animal and the location where the shark was tagged. The shark's location shows up as either orange or blue circles, with orange being less than 30 days and blue more than 30 days.

In the top of the page are links to pages relating to OCEARCH, OCEARCH's partners, OCEARCH's work and their merchandise shop. In the right hand is the social media functions, linking to posts on OCEARCH's Facebook posts, Twitter-messages which include "@OCEARCH", OCEARCH's YouTube-videos, Instagram photos and OCEACH's blog posts. In the bottom of the page the social media functions in the right-hand box are repeated, including a "donate"-function and a subscription-service to newsletters. This data is also available on their mobile application "Global Shark Tracker" for iPhone or iPad, although the user interface varies slightly.

I would argue that the The Global Shark Tracker contains all the characteristics of a boundary object as described by Star and Griesemer, including indexing of objects, ideal types, standard forms and coincidental boundaries.

An interesting thing, in my perspective, is that the patterns of movement differ between all the sharks. There is not one conclusive way for them to move. It is testament to their individuality and narrows our focus from the general to the specific. They are acting, dictating when and where the dot will be the next time they surface. As I will discuss later, this individuality is important for the Twitter-profiles.

The Global Shark Tracker data has been of great help for scientists. The quote OCEARCH provide from Gregory B. Skomal, for example, states that: "Having access to Mary Lee's movements is addictive. These daily observations have provided amazing insights into her behavior off the Southeastern US" (OCEARCH, n.d.-c). The data from the expeditions are thus helpful *interessement*-devices for the first translation process. It is useful for *enrolling* scientists in supporting OCEARCH and its goal to bring scientists closer to sharks.

The data has led to numerous developments for OCEARCH, including tweeting sharks. The next chapter will revolve around the third and final translation process – the tweeting sharks.

4.2.4 Summary

In this chapter, I focused on the translation process that occurs during OCEARCHs expeditions. Namely, *the transformation of sharks*. I highlighted the importance of a separate problematization for gaining legitimacy within this translation process. This, I argued, is essential for legitimizing their mission of conservation from becoming one of capitalization.

As I highlighted, the process of attracting and capturing a shark is a negotiation process, where the shark and the OCEARCH crew negotiate for the terms leading up to the transformation. This negotiation process also signifies a change of representability, as only the successful negotiations allow the translation process to reach a transformation. It moves the issue of "sharks" as a plural object towards a role as an individual actor.

I also pointed out that the tracking-information have to transfer through the Argos Satellite-system before turning up at the homepage of OCEARCH – The Global Shark Tracker. Together with all evidence reported by the OCEARCH crew, our "familiarity" with this infrastructure make the validity-claims of this translation process legitimate.

The boundary object "The Global Shark Tracker" is also the boundary object that allows a connection between translation process 2 and 3. In the next chapter, I will discuss the creation of the Twitter-profiles and the success leading up to "the tweeting sharks".

4.3 Translation process 3: The tweeting sharks

The last translation process I will discuss is the transformation into tweeting sharks. Like with the second translation, this separation is not coincidental. Originally, it could not even be the same translation process. This is due to the initiator of this translation process not being OCEARCH.

The first tagged shark in OCEARCH's history, Genie, was tagged on September 13th 2012 (OCEARCH, 2012a). While this was the first shark to be tagged, it was not the first shark to appear on Twitter. The first shark to appear on Twitter was Mary Lee, a great white shark tagged on the 17th September 2012 (OCEARCH, 2012b). While these two sharks were tagged during the same expedition, it didn't lead towards an immediate creation of a Twitter-profile. Mary Lee did not get her Twitter-profile until 29h November 2012, over two months later than the tagging-date (Mary Lee the shark, n.d.).

It is a reason for this discrepancy between the first shark to get tagged, the first shark to get a Twitter-profile and the time it took to for the Twitter-profile to appear. It was due to the creator *not* being affiliated with OCEARCH. Rather, it was a journalist by the name Jim Ware who happened to come across Mary Lee through a news broadcast (Interview with Jim Ware).

In Jim Ware's own words from a 2015 article: "A little more than three years ago, on Nov. 28, 2012, an amazing thing happened. A great white shark tweeted" (Ware, 2015).

The random nature of this profile creation was not something that OCEARCH could anticipate. Yet, the data provided through The Global Shark Tracker was the starting point which made it all possible. OCEARCH thus indirectly contributed towards this translation process.

In this chapter, I will go through the translation process from The Global Shark Tracker to the tweeting sharks. This translation process I call *the tweeting sharks*. It is not limited to just the creation of the Twitter-profiles but the subsequent fame of these tweeting sharks. This story is thus not only a reflection on how they emerged, but how they emerged as *important*.

I will in this chapter focus on the first two tweeting sharks – which are also the most popular on Twitter – to elaborate on how they came to achieve this popularity.

4.3.1 The creation of Mary Lee and Katharine the shark

Mary Lee's and Katharine's Twitter-profile are the two most popular tweeting sharks (in terms of followers), having 129.000 and 53.600 followers respectively (Mary Lee the shark, n.d. and Katharine the Shark, n.d.).

While Mary Lee was created in November 2012, Katharine didn't appear before over a year later, on the 12th January 2014 (Katharine the Shark, n.d.). As mentioned, the creation of these Twitter-profiles was a random occurrence, and not a natural progression from The Global Shark Tracker.

The story of Mary Lee started in a discussion Jim Ware had with a fellow reporter. The discussion subject Mary Lee came up after she had been reported by news sources to ping near Jim Ware's location (Interview with Jim Ware). Jim Ware and the fellow reporter's discussion was whether Mary Lee had a Twitter-profile or not: "Surely she did, I thought. How could she not?" (Ware, 2015b). The creation of Mary Lee the shark's Twitter-profile was not an elaborate attempt at conservation, but rather a question on whether she participated in social media. In my interview with Jim Ware, he said that "Mary Lee was pinging off the coast of Wilmington, NC, where I live, and was making being mentioned the news. I decided

to see if she had a Twitter account. When I didn't find one, I created @MaryLeeShark. That was in November 2012" (Interview with Jim Ware).

For Jim Ware, Mary Lee was at first "all fun and games, with little thought about the impact" (Interview with Jim Ware). The beginning of this translation process is therefore distinct from the other ones mentioned. *It had no clear goal*. The main actor (Jim Ware) made a problematization with seemingly little intent other than *having fun*. As I will come back to, the problematization has since changed from its initial state.

Likewise, the story of Katharine the shark started when Rob Landers was preparing a news story for Florida Today's story of a great white shark (Landers, 2015). In this setting, "a colleague joked that she should have her own Twitter account" (Landers, 2015). Thus, Katharine the shark became a Twitter-profile (Landers, 2015). In my interview with Rob Landers, he told me that "In 2015, Katharine was swimming off the coast near my home here in Florida. At that time I was a digital producer for a Gannett Media site and thought it would be funny for the shark to have a twitter feed" (Interview with Rob Landers).

Just as with Jim Ware, Rob Landers translation process also had *no clear goal*. It was just an attempt at *having fun*. However, this problematization has also changed from its initial state.

These origin-stories have striking similarities with each other. First, both the sharks where tagged and pinging near Jim Ware's and Rob Landers' home area. Second, the media reported on this pinging activity. Third, they were both journalists and acquainted with the media, including Twitter. Fourth, they were created due to it seeming like a fun experience.

Jim Ware and Rob Landers created a translation process for different sharks, yet, the main constituents remained the same. They became the *obligatory passage point* of the Twitter-profile, determining the future of these translation processes.

4.3.2 Translating the tweeting sharks

My earlier citation of the "battle with Mary Lee" was not reflected on by coincidence. It was from a blog post by OCEARCH, published over two months before Mary Lee appeared on Twitter (OCEARCH, 2012b). The name, Mary Lee, did not originating from Jim Ware, but from OCEARCH. And more specifically, she was named after Chris Fischer's mother (Whalebone, n.d)

Likewise, Katharine was named “in honor after Katharine Lee Bates, the Cape Cod resident who penned the song America the Beautiful” (Blandford, 2017), not from Rob Landers.

While Jim Ware and Rob Landers could have decided to *not* use these names, being in control over the Twitter-profiles, they chose to do so. This translation process must thus be seen a bit differently than the other ones. It was not Rob Landers and Jim Ware that created this information, rather, they were editors determining what should and should not be published. This points towards an obvious asymmetrical power-relationship. Having absolute power over what will be published, makes it impossible for other actors to gain control over this translation process. Yet, as I will argue, this claim is bolder than it is real.

It is obvious that OCEARCH’s efforts and The Global Shark Tracker had a direct influence in the creation of these profiles. If it were not for the success within translation process 1, and subsequent success during translation process 2, these profiles would be pure fiction. However, they are not pure fiction. As Rob Landers told me: “OCEARCH listed Katharine as immature when they tagged her in 2013. I thought I have a teenage daughter, Katharine is "immature" - why not make her a snarky teen age girl” (Interview with Rob Landers).

It is not only during the creation of the tweeting sharks that the Twitter-profile creators draw upon the success of the translation processes OCEARCH initiated. As Jim Ware notes with his work with Mary Lee: “When Mary Lee was more active, the first thing I would do in the morning and the last thing I would do at night would be to check her location on the OCEARCH Global Shark Tracker app on my iPhone. At work I would frequently check the app on my breaks to see if she had pinged. Daily or more often I would tweet out her current location, along with any observations I had about that location or other sharks in the same general area. One of the most interesting things I saw was how often she and Katharine would ping close by and almost at the same time” (Interview with Jim Ware). This directly acknowledges the significance of the tagging-technology utilized by OCEARCH, but also towards the shark’s involvement.

Likewise, Rob Landers point out that OCEARCH’s data “was and to a degree still is used greatly. Every time she pings, it’s another opportunity to educate people on the science of sharks and their importance to the world's ocean ecosystem. Proximity to other sharks always provides an opportunity for "play dates" or "Let's do lunch" tweets with other profiles. Truly helps add to the humor and reality of the shark personas” (Interview with Rob Landers).

It was The Global Shark Tracker that enabled these journalists to create these Twitter-profiles. A boundary object that allowed for cooperation, but also acted as a virtual witnessing technology. Without it, none of this would be possible.

However, this excludes two important actors. It was the shark, in collaboration with the news, that made these Twitter-profiles possible. If the sharks didn't ping, and if the news didn't report on this ping, The Global Shark Tracker would have made no difference.

In fact, (at least) eight actors had to come together to create the tweeting sharks: OCEARCH, scientists, sponsors, M/V OCEARCH, the shark, SPOT-tag and the satellite system, news sources, Twitter and the journalists. The notion of "Twitter-profile" does no justice to the complexity involved in the tweeting sharks.

This also creates another problem for me (as an analyst). Is it the Twitter-creator or the shark that is the main actor of this translation process? While the Twitter-profile creator created the Twitter-profile, the shark to a large degree dictates what should be written on the Twitter-profile. I would argue that the main actor within this translation process is in flux. The more popular the tweeting shark becomes, the more influential the shark itself becomes. I will elaborate more on this in the next sub-chapter.

4.3.3 Ascending to popularity

As already mentioned, Mary Lee and Katharine are famous sharks. However, this rise to famousness was not only due to creativity by the Twitter-profile creators, or the existence of The Global Shark Tracker. It was just as much a collaboration between the media and the shark.

As Jim Ware writes in his blog post: "Then on April 22, 2015, a dramatic increase in followers began as the result of news coverage related to Mary Lee's move north" (Ware, 2015a) and: "But that was nothing compared to the explosion in followers the next month. Mary Lee gained 68,500 followers in May 2015 as she traveled near the New Jersey shore and buzzed New York" (Ware, 2015a).

This quote clearly shows the importance of Mary Lee's movement pattern, and the media sources interest in her. When Mary Lee fancies a swim along a populated area, media sources

are quick to pick up on this fact. It seems that Mary Lee's agency is of vital importance to the Twitter-profile.

However, Mary Lee is not only a descriptive representation of her movement pattern. Neither are the rest of the tweeting sharks. They have gotten an independent persona from the data material provided by OCEARCH. A persona that has grown together with their audience.

As Rob Landers puts it: "It [Making her a snarky teen aged girl] seemed to work. The amount of sass and sweetness was just the character Katharine needed to win over the hearts of followers across the US and beyond" (Interview with Rob Landers). Katharine the shark is her own persona. A persona which corresponds with her actual features as a young "immature" shark. As Rob Landers continues, Twitter-users have generated "LOTS AND LOTS of retweets. People were fascinated by her. And it was awesome creating a tool to help settle the overwhelming fear people have of the oceans apex predator. As an engagement tool, it was extremely successful" (Interviews with Rob Landers). Katharine the shark is popular. She seems to have found the sweet-spot among her audience.

When asked about the successes of Katharine the shark, Rob Landers answered: "I think it has done everything one would hope it would do. It has educated and entertained audiences. It helped calm fears. It brought a smile to people's faces. My favorite part of voicing the shark was seeing dozens of children's drawings inspired by the account that parents would send Katharine. It was truly awesome" (Interview with Rob Landers).

Katharine the shark creates a bond with her audience. I would argue that drawing a picture of Katharine is an *emotional investment.* People care about this shark. This illuminates the point Petter Bøckman made, about the necessity of emotional resonance in pursuance of conservation (Interview with Petter Bøckman).

Likewise, Jim Ware pointed out that "the @MaryLeeShark account has taken on a life of its own. Longtime friendships were formed by followers who interact with each other and almost always include @MaryLeeShark in their replies. Other followers created their own shark accounts as OCEARCH tagged more sharks and added them to the tracker app, including one follower who later confided in me that Mary Lee helped her get through a battle with cancer. Members of the media have used the account to reach out to Mary Lee for interviews, usually keeping such interaction tongue-in-cheek" (Interview with Jim Ware). She "developed a

«queen of the sea» persona – a little bawdy, but always pro conservation" (Interview with Jim Ware). As he points out, Mary Lee and her audience have co-developed a type of humor which they call "shnarky" (Interview with Jim Ware).

Both Katharine and Mary Lee resonate with their audience. This is not meant metaphorically, but literally. Mary Lee and Katharine co-create a relationship – *a network* – in which they *enroll* their audience through *interessement*. They engage in dialogues, retweets, replies and tweets. Mary Lee and Katharine is thus not only a description of the shark's movement pattern. They are much more than that. Yet, the Twitter-profiles cannot be distinguished from the sharks themselves.

This is illustrated in Jim Ware's blog-post:

Screen-dump (Ware, 2015a).

This type of blog-post is not a random occurrence. They can be seen just by going to Mary Lee's and Katharine's Twitter-pages (Mary Lee the shark, n.d. and Katharine the Shark, n.d.). Mary Lee and Katharine thus become central actors in the tweeting sharks. Without them, the Twitter-profiles could not have had the same impact.

4.3.4 The tweeting sharks' agency

I have now discussed the creation of these tweeting sharks, and their rise to fame. I have yet to analyze them as actors within the conservation movement and the conservation network.

I have analyzed three translation processes so far in this chapter: *Getting scientists closer to sharks, the transformation of sharks* and *the tweeting sharks.* These translation processes do not exist in a vacuum. As I have shown, they are connected through the boundary objects M/V OCEARCH and The Global Shark Tracker. Yet, these three translation processes had different *problematizations*. However, whereas the first two translation processes were explicitly connected to enabling conservation of sharks, this was not the initial reason for the

tweeting sharks. For Jim Ware and Rob Landers, the sharks were mostly a *humorous* enterprise. Yet, the rise to popularity for these tweeting sharks also changed the Twitter-profile creators ambitions. They have pressing need due to the tweeting sharks' increasing agency.

Jim Ware pointed this out in my interview with him: "As I became more aware the way Mary Lee was changing attitudes about sharks from fear to fascination, I felt a great deal of responsibility. That was never felt more than when there were two shark bites in one day near where I live. I knew then that what @MaryLeeShark said or did would be very important" (Interview with Jim Ware).

Mary Lee's fame gave her an increased agency as a representative in the conservation network, an *individual;* a "spokesshark". She was given the agency to represent not only herself, but sharks in general. She was designated into a role with transformative power. The shark, represented by data points on the global shark tracker, had through her fame been transformed into an authority on *shark behavior*.

The *problematization* thus changed, from being light-hearted humor to using the tweeting sharks' agency in order to change people's attitudes about sharks. This problematization also designated new (and perhaps unexpected) roles. The Twitter-profile creators became subordinate to the sharks. As the initial problematization suggests, the profile-creators *enrolled* the sharks to create entertainment. However, it was the shark's agency that would now appear to dominate the Twitter-profile. In this problematization, the sharks enroll the profile-creators. *Changing people's attitudes about sharks* signifies that the sharks' agency is the focus point, and the Twitter-profile creators become the medium, which allow the sharks to "live" on social media. Likewise, their audience became part of this problematization. The main goal was to transform their attitudes about sharks, not to be entertained. *This, I would say, is when the tweeting sharks became an actor in the conservation network.*

Rob Landers, when asked about the greatest success of Katharine the shark, answered "reach. Getting the message that sharks aren't mindless killing machines into the hands of thousands upon thousands of people is Katharine's greatest success" (Interview with Rob Landers).

Likewise, Jim Ware points out that "Mary Lee's spring 2015 visits to New Jersey and New York created unprecedented growth in followers, which resulted in sustained media coverage

for @MaryLeeShark and OCEARCH. People who had once feared sharks suddenly were hoping she would make an appearance in their waters" (Interview with Jim Ware).

As both of these profiles show, none of the Twitter-creators pointed out that the initial problematization was the main success. Rather, the success was measured in how many people had changed their attitudes about sharks.

While conservational claims normally are argued by humans clearly separated from the animal(s) they represent, it is difficult to distinguish between Rob Landers and Katharine and Jim Ware and Mary Lee. Just as Star & Griesemer (1989) points out, it seems the original translation process lost the battle against the new one. The main actor changed places with another actor.

It is plausible to understand the tweeting shark *as* the shark, gaining legitimacy through the translation processes it is based on. Because of the change of a main actor within this *translation*, the tweeting sharks' agency have changed. They are no longer bound within the confines of comedy but are free to speak up about matters that affect them. In this way, the tweeting sharks align towards the original intention when OCEARCH started up – to help conservation-efforts of sharks.

The fact that the actors differ from the other two translation processes are in my viewpoint fundamentally important. While their goals align, their agency differ. OCEARCH needs to fund its' expeditions, and the expeditions need to conduct scientific experiments. If the tweeting sharks were used to secure funding, and if the point with the expeditions was to produce tweeting sharks, there would not be much of a difference between the tweeting sharks and a commodity. This is a concern within the field of digital conservation, and one I share.

This is an important aspect to illuminate, as it impacts the legitimacy of the tweeting sharks. I believe that the role of these Twitter-profiles need to be kept separate from OCEARCH. If OCEARCH were to take over, they might also take over the network, making their own agency a priority over the shark's.

These concerns are not unfounded. When I asked Rob Landers on whether he collaborated with OCEARCH he answered: "Collaborate? You could say that. For the past year, year and a half, OCEARCH's social media team has really taken on the bulk of the posts on the account.

I shared the account with them because I was short on time to keep up the - for lack of a better word - frenzy. The tags are only good for approximately 5 years so I wanted to make sure that Chris and his team got the biggest bang out of the account to educate people while they could" (Interview with Rob Landers).

Similarly, Jim Ware answered: "I have collaborated with OCEARCH by live tweeting during Shark Week TV shows, by pushing out information about fundraising and by retweeting information related to upcoming or current expeditions. I have been aboard the M/V OCEARCH during two expeditions and have had the opportunity to speak with world-class shark experts. I am thankful for the collaboration, but also that OCEARCH has no problem with @MaryLeeShark remaining independent" (Interview with Jim Ware).

As Jim Ware points out, remaining independent is an important issue for the tweeting sharks. However, this is not necessarily easy. As Rob Landers points out, OCEARCH have their own social media department. Having dedicated resources that can take over makes OCEARCH a powerful actor, an actor with *transformative effects* on the tweeting sharks' agency. Without intentionally hurting the tweeting shark's legitimacy, OCEARCH may very well do exactly that unwittingly.

As I've shown in this sub-chapter, the tweeting sharks' agency is in flux, depending on which actor has the position as main-actor. When the sharks have the main role as *obligatory passage point*, they gain transformative effects on the network of conservation. However, if translation process 1 or 2 get entangled with translation process 3, the agency of the tweeting sharks could be changed.

4.3.5 The disappearance of Mary Lee

Mary Lee's legendary run lasted for almost 5 years, before she went missing on the 17th June 2017 (Radel, 2017). After being a vivid surfacing shark, her tracks suddenly stopped. No-one really knows what happened to Mary Lee. The SPOT-tag may have run out of batteries, the tracker might have stopped functioning, or she may have decided not to surface anymore.

When people are lost, this information often hit the news. Yet, we normally wouldn't report on an ocean-dwelling creature's disappearance. However, Mary Lee, like Keiko did before her, created headlines around the world when she disappeared. Naturally enough, one might

say that Mary Lee was a celebrity. A quick google search for "Mary Lee the Shark" will provide links with titles like "Where is Mary Lee the shark? We may never know again» (Radel, 2017), "Mary Lee, where can she be? Great white shark disappears from tracking" (Petersen, 2017) and "Great white shark, made famous online, disappears from tracking" (CBS/AP, 2017). In none of these headlines was "representation" an aspect. It was not about OCEARCH, not about The Global Shark Tracker and not about the Twitter-profile creators. It focused solely on one specific actor, Mary Lee the shark.

Mary Lee the shark is in many ways the essence of this phenomenon. The tweeting shark with the most transformative power in the network of conservation. She was the first shark to appear on Twitter, and the most famous one. If it had not been for this specific great white shark, Mary Lee the shark would not be possible.

We cannot just replace Mary Lee with another shark, as doing so would break the legitimacy claims of the entire infrastructure. The reason why she was perceived as legitimate was due to our ability to follow her trough the various translation processes. Mary Lee was and will forever be the only Mary Lee the shark.

4.3.6 Summary

In this chapter, I illuminated how the tweeting sharks became a phenomenon. Due to chance, Jim Ware and Rob Landers was at the right spot, at the right time, to hear news sources report about Mary Lee and Katharine pinging nearby.

Due to this event, Jim Ware and Rob Landers created Twitter-profiles for Mary Lee and Katharine. These Twitter-profiles were not pure fiction but based upon perceived characteristics from The Global Shark Tracker, their name and other sources of information.

Jim Ware and Rob Landers gave the sharks' an online persona which became popular with the audience. However, this popularity also changed the characteristic of the translation process which created the tweeting sharks. The sharks themselves gained more power within the network, effectively become the actor that controlled the agency of this profile. The problematization thus went from being an entertaining activity to become an actor in the conservation network, trying to influence its audience' perception of sharks.

In my opinion, this is especially apparent in the disappearance of Mary Lee. The main actor of this tweeting shark, the shark itself, became the headlines of the news stories.

In my analysis of the translation processes that give raise to the tweeting sharks, one thing strikes me as especially important. The "shark" as a general plural form, have been turned into the "shark" as an individual. This leads me to the final chapter of my analysis, what is a tweeting shark?

4.4 What is a tweeting shark?

The question I asked at the start of this chapter, has been elaborated on, but not answered directly. What exactly is a tweeting shark?

I have through my analysis focused on three translation processes that give raise to the tweeting shark. These are: *Getting scientists closer to sharks, the transformation of sharks* and *the tweeting sharks.* These translation processes are bound together by two boundary objects: *M/V OCEARCH* and *The Global Shark Tracker*. I pointed out that these translation processes do not occur in a vacuum and affect each other. As I have shown, the translation processes are volatile and not necessarily stable. This is true both within a given translation process, and between the translation processes. As I pointed out in chapter 3: "analytical approach", this is due to the *unpredictability* of mediators. The actor with the most transformative effect within and between these translation processes can quickly change it.

In translation process 1, I investigated how OCEARCH enrolled scientists, sponsors and the general audience to enable the goal of getting scientists closer to sharks. There is a chance that this could be corrupted, i.e. that, for example, the sponsors could set terms that required OCEARCH to act in a certain way. While I have not identified information suggestion this, it is not an unreasonable possibility.

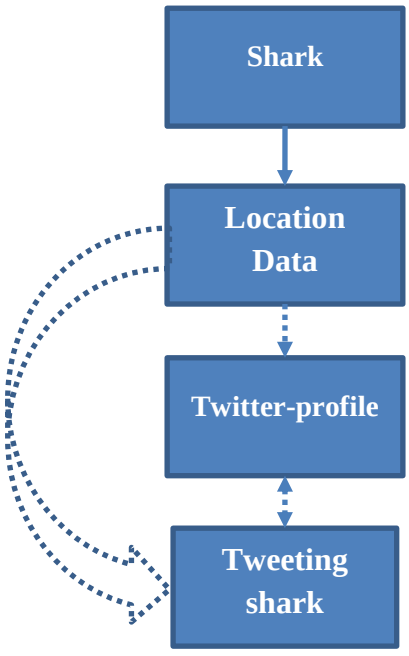
In translation process 2, I investigated how the OCEARCH crew negotiated with the sharks, illuminating that not all sharks were interested in being enrolled towards this project. The capture of the sharks that did agree to these terms thus became the focus point in discussions over representativity. In effect, this meant that the shark was an actor within this translation process, and a powerful actor at that. It is possible to imagine that no sharks would agree to the terms, and if so, the transformation could not have occurred. However, the ones that did

went through what I would deem a familiar infrastructure, construing legitimacy as a valid representation of a specific shark.

In translation process 3, I investigated how the tweeting sharks were created – and how they took over this translation process. Their popularity made the shark's agency more important than the Twitter-profile creators original intention. It was clear within this translation process, that the main actor could change within the translation process.

In my analysis, I also pointed out how actors in one translation process could take over as the main actor in other translation processes. What this means is that these translation processes are inherently unstable. *The tweeting sharks are thus an outcome of the current stability of all three translation processes.*

Below I illustrate how a tweeting shark, as described, currently functions:



Model 3: Illustration of a tweeting shark

This illustration starts with the 'shark' that agrees to the negotiation in translation process 2. Its 'location data' is sent through the Argus satellite-system and arrive at The Global Shark Tracker whenever it wants to surface. This is marked by a *solid* arrow, signifying our belief that the location data is *valid*. The location data influences both the 'tweeting shark' and the 'Twitter-profile'. This is marked by an arrow with *dotted* lines, signifying that the Twitter-profile can choose whether to publish the data, and that we, as an audience, can choose to

look at this data at The Global Shark Tracker. The 'Twitter-profile' influences the 'tweeting shark' but is also influenced by it. This is marked by a *double-arrow* with *dotted* lines.

In conclusion, the tweeting shark consist of the location data of a specific shark, which is also connected to the Twitter-profile. However, the tweeting shark also influences the Twitter-profile, meaning that the concept of a 'tweeting shark' creates guidelines that the Twitter-profile *ought* to follow. The popularity of the tweeting shark may influence the Twitter-profile, changing the original problematization into a new one.

Underneath this illustration of 'the tweeting shark', lies the three translation processes and two boundary objects that make this phenomenon a possibility.

4.4.1 The tweeting sharks

When I did this analysis on 19.09.2017, there were 65 sharks belonging to the list "The Sharks", created by OCEARCH on Twitter. These sharks have their own profiles, detailed below:

Tweeting shark				
	Name of shark	**Type of shark**	**Twitter-link**	**Number of followers**
1	Great White Azlyn	Great White Shark	https://twitter.com/Greatwhiteazlyn	277
2	PeggyHughes Da Shark	Shortfin Mako	https://twitter.com/MakoPeggyHughes	408
3	Whale Shark Canyon	Whale Shark	https://twitter.com/SharkCanyon	528
4	Amagansett Shark	Great White Shark	https://twitter.com/SharkAmagansett	738
5	JDtheShark	Great White Shark	https://twitter.com/JDtheShark	327 (haven't tweeted)
6	Mission the Shark	Great White Shark	https://twitter.com/MissionShark	319
7	Gurney Shark	Great White Shark	https://twitter.com/Gurney_Shark	854
8	Bruin the Shark	Great White Shark	https://twitter.com/BruinTheShark	796
9	Finn the Great White	Great White Shark	https://twitter.com/GreatWhiteFinn	870
10	Beaufort the Shark	Tiger Shark	https://twitter.com/SharkBeaufort	1389
11	Shark Savannah	Great White Shark	https://twitter.com/SharkSavannah	3078
12	Shark Weimar	Tiger Shark	https://twitter.com/SharkWeimar	1618
13	HiltontheShark	Great White Shark	https://twitter.com/HiltonTheShark	17.2K
14	Whale Shark Rocky	Whale Shark	https://twitter.com/WhaleSharkRocky	6570
15	CubsWin the Shark	Blue Shark	https://twitter.com/CubsWinTheShark	992
16	White Shark Cisco	Great White Shark	https://twitter.com/Shark_Cisco	3664
17	George the Shark	Great White Shark	https://twitter.com/GWSharkGeorge	2714
18	Madaket Millie	Great White Shark	https://twitter.com/MillieMadaket	1264
19	YETI the Shark	Great White Shark	https://twitter.com/YETItheShark	1417
20	Grey Lady Shark	Great White Shark	https://twitter.com/GreyLadyShark	2519
21	Manhattan	Great White Shark	https://twitter.com/ManhattanWS	989
22	Gratitude	Great White Shark	https://twitter.com/Shark_Gratitude	2780
23	White Shark Teddy	Great White Shark	https://twitter.com/Shark_Teddy	2319
24	Hampton the Shark	Great White Shark	https://twitter.com/HamptonTheShark	3117
25	Thomas	Blue Shark	https://twitter.com/BlueSharkThomas	1425

26	Hudson White Shark	Great White Shark	https://twitter.com/Shark_Hudson	3274
27	Great White Montauk	Great White Shark	https://twitter.com/SharkMontauk	7,044
28	Oscar	Shortfin Mako	https://twitter.com/MakoSharkOscar	3548
29	Peggytheshark	Tiger Shark	https://twitter.com/PeggytheShark	5566
30	Lexi the Tiger Shark	Tiger Shark	https://twitter.com/SharkLexi	1802
31	HelenTheShark	Great White Shark	https://twitter.com/HelenTheShark	17.1K
32	Hammerhead Buddy	Hammerhead Shark	https://twitter.com/HammerheadBuddy	2469
33	Duval	Tiger Shark	https://twitter.com/Tigersharkduval	323
34	Viper Shark	Tiger Shark	https://twitter.com/SharknamedViper	4109
35	Georgia Tiger Shark	Tiger Shark	https://twitter.com/SharkGeorgia	3606
36	Miss Costa	Great White Shark	https://twitter.com/MissCostaShark	2368
37	Mako Shark Daymond	Shortfin Mako	https://twitter.com/DaymondShark	1824
38	SouthJaw the Shark	Tiger Shark	https://twitter.com/theSouthJaw	1677
39	Betsy	Great White Shark	https://twitter.com/Betsy_shark	1096
40	Jax Tiger Shark	Tiger Shark	https://twitter.com/tigersharkjax	1620
41	Mako Shark Carl	Shortfin Mako	https://twitter.com/MakoSharkCarl	1949
42	Shark Catalina	Tiger Shark	https://twitter.com/SharkCatalina	2879
43	Elias the Hammerhead	Hammerhead Shark	https://twitter.com/EliasHammerhead	2304
44	Leeuwin Shark	Tiger Shark	https://twitter.com/SharkLeeuwin	2588
45	Bindi Shark	Tiger Shark	https://twitter.com/BindiShark	3542
46	Tiger Shark Ningaloo	Tiger Shark	https://twitter.com/TigerNingaloo	1721
47	Pablo el mako (Spanish Shark)	Shortfin Mako	https://twitter.com/Pablothemako	2400
48	Deep Blue (Not tagged)	Great White Shark	https://twitter.com/Deep_Blue_Shark	3400
49	Philip (Not affiliated with OCEARCH)	Great White Shark	https://twitter.com/philiptheshark	3327
50	Sunny Shark	Tiger Shark	https://twitter.com/SunnyTheShark	2569
51	Kimberley Shark	Tiger Shark	https://twitter.com/swim_with_kim	3433
52	Louise Shark	Great White Shark	https://twitter.com/LouiseShark	11.4k
53	Madeleine the Shark	Tiger Shark	https://twitter.com/Madeline_Shark	3081
54	Tiger Shark Lemanja	Tiger Shark	https://twitter.com/LemanjaShark	2472
55	Genie the Shark	Great White Shark	https://twitter.com/GenieTheShark	9961
56	Hammerhead Einstein	Hammerhead Shark	https://twitter.com/Shark_Einstein	5894
57	Perth the Shark	Tiger Shark	https://twitter.com/Perth_the_Shark	2713
58	Gnaraloo Shark	Tiger Shark	https://twitter.com/GnaralooShark	2423
59	Shark Freo	Tiger Shark	https://twitter.com/Freo_Shark	2402
60	Tiger Shark Ned	Tiger Shark	https://twitter.com/TigerSharkNed	3768
61	Songwoman Maroochy	Tiger Shark	https://twitter.com/MaroochyShark	1548
62	Jedda the Shark	Tiger Shark	https://twitter.com/Jedda_the_Shark	4708
63	Lydia Shark (Still active)	Great White Shark	https://twitter.com/RockStarLydia	39.7K
64	Katharine the Shark (Still active)	Great White Shark	https://twitter.com/Shark_Katharine	51.9K
65	Mary Lee the Shark (Still active)	Great White Shark	https://twitter.com/MaryLeeShark	129K

Table 1: Tweeting shark list

As is apparent from this table, Mary Lee (65) especially, but also Katharine (64) stand out from the rest with substantially more followers. This leads me to assume that the shark's

movement patterns, media coverage, originality and their Twitter-personality are important elements in the popularity of the tweeting sharks. Mary Lee (65), but also Katharine (64), might have become more popular due to a combination of these factors.

As I mentioned in chapter 3: “analytical approach”, transformative effects matter. Not all can become celebrities. This is true whether the entity is a shark or a person. I would argue that this table provide a reasonable argument for limitation of the number of tweeting sharks. There is no reason to believe that increasing the number of tweeting sharks will lead to greater conservational effects. I would argue that it is precisely the scarcity that make the tweeting sharks interesting actors.

In the next chapter, I will discuss how the tweeting sharks achieve transformative effects in conservation.

5 Discussion

In this chapter, I will further discuss the research question:

How do the tweeting sharks achieve transformative effects in the network of conservation?

As I discussed in my introduction, both human and non-human actors can have transformative effects on reality. This is an especially important point with digital technology, which can reach an enormous audience. I also problematized the possibility of misusing this technology, making that which is illegitimate, legitimate.

In chapter 1.6: "research question", I provided an illustration of how the tweeting sharks relates to both the conservation movement and the network of conservation. These can be understood as three different networks, containing different actors. However, tweeting sharks is an actor within the conservation movement, which in turn is an actor in the network of conservation. I also pointed out that not all actors within the conservation movement pursue the same goal. Some actors are "masquerading" as a conservation movement actor, all though their goal might be very different than promoting conservation.

During my analysis, I pointed out how the various actors through three translation processes and with the help of two boundary objects where able to create a new phenomenon – the tweeting sharks. Within this analysis, I also illuminated how the tweeting sharks could gain legitimacy as transformative actors, and the importance of keeping these translation processes separate.

When discussing how the tweeting sharks achieve legitimacy, my stance is that I ought to reflect upon their legitimacy. Are they actors that pursue transformative effects aligned with the agency of the conservation movement, or do they exploit their agency as a legitimate actor.

In my discussion of the research question, I will divide the question into three sub-chapters. The first sub-chapter will illuminate the transformative effects on *representation*. As I pointed out in the analysis, representation changes throughout the translation processes. The shark changes from being an "object" into an "actor". In this sub-chapter, I will discuss how this change of representation changes how we view animals.

The second sub-chapter will illuminate the transformative effects on conservation. As I pointed out in the analysis, the translation processes change the focus from sharks in "general" into "individual". In this sub-chapter, I will discuss how this change affect how we view conservation of sharks.

The third sub-chapter will illuminate the legitimacy of the sharks. It is the essence of how the sharks go from an entertaining Twitter-profile into a believable individual that resonates with us, as an audience. Legitimacy is what makes tweeting sharks *interesting* as a phenomenon. However, legitimacy can also be achieved by obfuscation of reality. In this sub-chapter, I will discuss why legitimacy matter, and how the risk of misuse of digital conservation relates to the tweeting sharks.

Finally, I will elaborate on fruitful approaches for further research.

5.1 Transformative effects on representation

As Horak (2014) pointed out, animals in documentaries are often artificial representation giving a false view of reality. Their representation is often heavily loaded with ideological bias, having no real effect on conservation efforts (Horak, 2014). I would argue that this is, in part, due to the objectification of animals. They are often represented in a way that aligns with the documentary maker's problematization. Except for appearing in front of a camera, animals have no real agency within the documentary. They cannot decide what should be published, and in what order. In other words, documentaries give a false allure that animals are without agency. They are shown to always be active, as mindless killers (in the case of sharks) or cute, which is especially apparent with dogs and cats.

I would argue that this changes with the tweeting sharks. They went from being an object in translation process 1, to a negotiating actor in translation process 2, to an active participant – and eventually the main actor – within translation process 3. It is clear by just looking at The Global Shark Tracker, the Twitter-profile or the news headlines that these sharks *have* agency. The Twitter-profile creator cannot write anything he or she would like, and still appear legitimate in the eyes of the audience. *They cannot do this because we watch the same sources they do*. In other words, there are several virtual reality technologies that prevent abuse of authority from happening.

These sharks control the information flow to a great extent. My interviews made this clear, as there was a direct link between the sharks' movement patterns and their popularity. This is in stark contrast to the picture created by Horak. Information cannot readily be manipulated towards an ideological bias.

The fact that these sharks do not have a demonic narrative attributed to them shows that this have an effect. How can we otherwise worry about the disappearance of a mindless killer? Humans care about these sharks, not because of their Twitter-profile but because of their agency. They can generate friendships and help people through though times.

Sharks as a consultation actor is, at least to me, something unheard of. The only animals I've heard of being able to produce this effect, are domesticated pets. Perhaps the reason for this is that we are now able to spot the agency of this marine creature? Are these tweeting sharks illuminating the sharks agency in a way we only could achieve with the animals that shared our homes?

The tweeting sharks are thus, at least in my opinion, actors that changes the wild into the domesticated. They can form emotional bonds with their audience. As Benson (2010:190) pointed out, tracking technologies make emotional intimacy possible with the audience. The tweeting sharks might be an advancement of this prospect.

5.2 Transformative effects on conservation

As I pointed out in the introduction, animals are usually represented by human actors. They are objects that become important, because we say they should become important. However, that is not always the case. Lassie was important, because Lassie was Lassie. Keiko was important, because Keiko was Keiko.

These animals became important, because they displayed agency in the movies/TV-series they starred in. However, these animals did not just become important. They became famous. Celebrities, even. Lassie was not just a "dog". Keiko was not just a "killer whale". They were themselves, identifiable as television stars.

However, these animals became important by starring in a television-show. They became famous because they acted according to a script defined by the television-director. As such, their agency was limited from what it could have been. They became famous for a role, just as

a human actor becomes famous for a role. Keiko and Lassie were not free from the ideological bias inherent in their role. They can thus not be said to be a *representative* of themselves. Yet, they had a big impact on us. As I discussed in the introduction, Keiko was able to *transform* the usage of tracking-technologies. He was able to pave way for the tweeting sharks.

Like Keiko, the tweeting sharks have a name, and some have become famous. They become famous because they are distinguishable as individuals. Not because they are sharks. Yet, these tweeting sharks do something more. They make what was previously invisible, visible. Unlike Jaws, these are not sharks lurking in the shadows of the deep ocean. They are readily available a mouse-click away. In this sense, the tweeting sharks also transform *nature*.

Through all of the translation processes, the tweeting sharks take with them nature and make it something different in the process. In translation process 1, they are the unknown of the deep sea that OCEARCH needs to garner money in order to find. OCEARCH are true explorers in this regard, venturing into the unknown. In translation process 2, they are visible actors negotiating with the OCEARCH crew. Unlike in translation process 1, they are now tough negotiators arguing about the conditions for their capture. After this capture, however, they are known beings which we can pinpoint on an interactive map. In translation process 3, this goes even further. Not only are the sharks readily available, but they also communicate.

The tweeting sharks make sharks part of the social landscape. What was previously unknown is now actively trying to change our attitudes towards them.

5.3 The construction of legitimacy

The last point I want to discuss is the construction of legitimacy – or rather, how the structure of the tweeting sharks allow legitimacy to be construed. As I discussed in chapter 1: "introduction", legitimacy is important. It is especially important when digital technology is utilized. This is due to the reach of these technologies. Mary Lee, for example, have 129.000 Twitter-followers. Her reach is broad, and global. She can reach audiences regardless of national borders. This means that Mary Lee has influence on how we view reality.

Yet, this number of Twitter-followers is not a small feat. Mary Lee must appeal to her audience in order for this to happen. As the table in chapter 4.4.1: "the tweeting sharks" illuminate, it is not a given that this happens – even for the tweeting sharks.

All tweeting sharks share the possibility of appealing to their audience. These tweeting sharks can achieve transformative effects on representation and on conservation. However, if they do not have legitimacy, this would be all for naught. If no-one recognized Mary Lee as an interesting actor, she would have 0 followers, rather than 129.000.

The legitimacy that an actor has, might also be taken away. As Morita et al. (2013) points out, the government in Japan had a legitimacy crisis after a tsunami hit the Fukushima power plant, resulting in a meltdown of nuclear reactors. The Japanese population became uncertain on whether the government was giving the correct information or withholding important information about the effects of this disaster (Morita et al. 2013). As Morita et al. argues: "the authorities continuously failed to establish a coherent frame that could contain the many ongoing symbolic (rumors) and material (radioactive) overflows" (2013:83).

I would argue that it is a link between this frame and legitimacy. The frame consists of the evidence presented to maintain *belief* in the authorities right to authority, i.e. legitimacy. If the frame is incoherent, for example by spreading false or questionable information, the frame might fail. Similarly, if the validity of the claims is proven false, the frame might also fail. The legitimacy crisis in Japan was due to the legitimacy of the government being under threat. It was no longer clear that the government was a legitimate actor.

However, in the case of Fukushima, lay-people created an interactive map – a virtual witnessing technology -, enabling lay-people all around Japan to plot in radiation data themselves (Morita et al. 2013). The utilization of this map lead to a restoration of the legitimacy of the government. It became clear that what the government had maintained within this frame was valid (Morita et al. 2013). The public responsible for utilization of this map returned the legitimacy where it had once been, and simultaneously changed how radiation measures were conducted within Japan (Morita et al. 2013).

There are similarities between the case of Fukushima and the structure of the tweeting sharks. It is interesting to note that it was an interactive map that was used to provide legitimacy for the government in Japan. As I've elaborated on earlier, the tweeting sharks also utilize an

interactive map – The Global Shark Tracker. We can monitor the location data of the sharks – just as the lay-person could monitor the radiation in Japan. The Global Shark Tracker is one of many evidences that support the tweeting sharks' validity. We do not have to believe the information provided but are enabled to validate these claims ourselves. We believe in the validity of the tweeting sharks because we can *virtual witness* the validity of the actors' claims.

However, in the Fukushima case, lay-people could plot in the radiation data themselves. It was an easy-to-use measuring equipment that could be utilized with little training (Morita et al. 2013). This is not easily accomplished with the tweeting sharks. It requires a lot of funding to conduct expeditions, in addition to the dangerous process of negotiating with one of the more dangerous animals - sharks. I would argue that lay-people should not tag sharks themselves, as doing so would indeed be a reckless endeavor. Instead, we must believe that the actors are doing what they say they do.

This is the reason why the separation of these translation processes is important. If one actor, for example OCEARCH, were to take over the Twitter-profiles, could we then trust the information being presented? If one translation process where to overtake the others, the tweeting sharks could be susceptible to the same legitimacy loss as the Japanese government during the Fukushima crisis. They may not be trustworthy to us, because of the impossibility to verify the claims put forward by the actors.

However, this is not to say that they would be able to exploit the legitimacy of the conservation movement. If, for example, these tweeting sharks turned into "marketing machines", would we still bother to take them seriously? My understanding is that such an attempt is more likely to ruin the legitimacy of the actors involved. It does not seem likely that any actor will be able to turn what is illegitimate, legitimate within the tweeting sharks. It seems unlikely that creating tweeting sharks as money-making machines is effective. I illustrated this in the table, where there is a clear difference between the followers of each tweeting sharks. They seem immune to commodification. However, this might of course change.

What, then, is the answer to the research question?

How do the tweeting sharks achieve transformative effects in the network of conservation?

The tweeting sharks achieve transformative effects in conservation due to two important reasons. They have a structure that is divided into three different translation process, and the evidence is open for verification by the audience. It allows the sharks' agency to have an influential role, and thus making what is wild available a mouse-click away. The shark is obviously not writing the messages on the Twitter-profile, yet it is able to participate and interact with us. The shark is an "immutable mobile" (Latour, 2005:223), an actor that carries with it its' key characteristics, even though it went through multiple transformations. From an object that would interest scientists, into a negotiator at sea, to the main actor in the tweeting sharks.

Due to this, the tweeting sharks become legitimate actors within the conservation movement and the network of conservation. They become actors highly relevant for the conservation movement due to the sharks' agency reflecting a change from an ideological picture of a "devilish" creature, into a social neighbor that cares about helping people through though times. In addition, they become actors in the network of conservation, representing a change in how we view these sharks. From wild fearful unknowns, into individuals' worth protecting.

As this discussion signify, the shark, as the main actor in the tweeting sharks, become an actor within other networks. They are able, through this medium, to participate in discussions in the network of conservation. In chapter 3: "analytical approach", I described my usage of transformative effects. This usage entail that transformative effects are on a continuum, depending on the strength of the actor in relation to others within the network. Tweeting sharks might have a varying degree of transformative effects in the network of conservation. I would argue that the agency they have, depend on the influence they achieve.

This construct is not a stable entity, however, and only time will tell what happens to this emergent phenomenon. I would like to point out though, that it is delighting to know that the next time I log onto Twitter - I might be talking with a shark.

5.4 Further research

While this study has not explicitly discussed how valuation practices influence these kinds of phenomenon, it does occur to me to be of importance. As an approach to further research, it would be interesting to, for example, investigate how OCEARCH values the tweeting sharks. Are they primarily understood from a marketing perspective, or as a medium for sharks to gain a voice in the network of conservation?

This is not only local to OCEARCH, but all actors within the tweeting sharks. It seems likely, for example, that Rob Landers have a different approach to valuation of the tweeting sharks than Jim Ware. I say this due to his notion that "the tags are only good for approximately 5 years so I wanted to make sure that Chris and his team got the biggest bang out of the account to educate people while they could" (Interview with Rob Landers).

It would also be interesting to investigate how the network of conservation valuate the tweeting sharks. Are they seen as an "object" to further conservation, or a purposeful way of including new actors?

The combination of actors within the tweeting sharks is a novel development, and they are made within a highly complex structure. If other similar projects were to appear, furthering an actor-network approach towards these entities might lead to interesting new information. How, for example, can these phenomena increase their transformative effects?

6 Conclusion

The research question that lead this study was:

How do the tweeting sharks achieve transformative effects in the network of conservation?

I started this master thesis by discussing the conservation movement, the network of conservation and how the tweeting sharks were related to these networks. Within this discussion, I pointed out the necessity of legitimacy for an actors' agency. Thereafter, I discussed how animals, technological and human actors achieved transformative effects, and how tracking-technologies could provide a new type of intimacy towards the animal in question. This, I argued was something the tweeting sharks were able to achieve. My interest in this topic was to understand how the tweeting sharks, a complex structure with multiple actors, were able to achieve transformative effects in the network of conservation.

After this initial discussion, I elaborated on my methodological approach, and how actor-network-theory and boundary object emerged as fruitful theoretical concepts for explaining the structure of this phenomenon, consisting of different translation processes and boundary objects.

In my analysis, I investigated three translation processes: *Getting scientists closer to sharks, the transformation of the sharks* and *the tweeting sharks.* In the analysis, I went chronologically through these translation processes, discussing how the main actors approached the problematizations. Within this analysis, I illuminated how the translation processes were bound together by two boundary objects: *M/V OCEARCH* and *The Global Shark Tracker.* These translation processes, I argued, needs to be kept separate to ensure that the sharks' agency could be kept throughout the different translations.

By utilizing the actor-network approach, it was possible to identify how tweeting sharks became actors, influenced by different agencies. I learned that there are tensions between and within these translation processes, which may alter the tweeting sharks course in the future.

The tweeting sharks achieve transformative effects through a separation of these translation processes, and by making the audience able to validate the legitimacy of the actors' claims through the usage of virtual witnessing technologies. This, I argued, enable a change of

representation, from sharks being an object into sharks as actors with agency. It also enabled a change of focus from the species into the individual within the network of conservation.

Through all these processes, the sharks were able to keep their agency. They were an ‘immutable mobile’ holding onto key characteristics through the translation processes. The sharks themselves, through the tweeting sharks, thus became part of the network of conservation and the conservation movement.

However, the degree to which they transform the network of conservation and the conservation movement is dependent on their power in relation to other actors. As such, their transformative effects may vary considerably.

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