Boats don´t fish, people do.

A sociological contribution towards holistic fisheries bycatch management

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Abstract

People have always been utilizing natural resources from the sea with various impacts on fish stocks and the marine environment. An issue that arises from humans´, specifically fishers´ interaction with the sea, is the entanglement of marine birds and mammals in fishing gears, in particular gillnets, as a result of which these air-breathing animals drown. These incidents are called *bycatch.* Gillnets have a long history and tradition in fishing in the Baltic Sea and are also one of the most common gears worldwide. Bycatch of seabirds and marine mammals in gillnet fisheries is therefore a hazard for conservation globally. Measures on bycatch mitigation in fisheries management so far are mostly based on technological and ecological findings. There is often a lack of knowledge concerning the heterogeneity of fishers´ actions and drivers, despite its importance for effective fisheries management.

This dissertation considered the case of the German gillnet fleet in the Baltic Sea to generate an ontological understanding of fishers´ social practices to inform management and develop bycatch mitigation measures.

Natural resource sociology offers the lens to look at this objective. In this dissertation the praxeological theory of structuration, extended by the concept of agency by is applied to the research question. The qualitative empirical research was conducted applying problem-centred interviews, analysed with documentary method. An expert-workshop about political and administrative aspects of bycatch management complemented the empirical research.

With the praxeological view and in applying the concept of agency, three types of fishers´ dominating agency were distinguished:

(i) Fishers with a dominating *projective* (future-oriented) agency plan long term, keep abreast of current developments in the fishery and develop teleological projects.

(ii) Fishers with a dominating *evaluative* (present-oriented) agency constantly evaluate as well as re-evaluation their situations. Evaluative social practices are not teleological and are rather characterized in the fishery by decisions that are directed to present situations. This can also show in deviant behaviour

(iii) Fishers with a dominating *iterational* (past-oriented) agency are characterised through the iteration of known schemes of action, which therefore reproduce social practices constantly. Such iterational aspects can be seen in fishers who solely apply gillnets.

Furthermore, the analysis of bycatch practice resulted in two different types: (i) *non-normalization* of bycatch, mostly concerning the bycatch of harbour porpoise, a critical situation interrupting the daily routine and (ii) *normalization* of bycatch, mostly concerning the bycatch of seabirds which was understood as part of a routine.

In applying the knowledge of different fisher types and bycatch practices to possible management instruments, numerous measures that can be considered by fisheries managers

were identified and their potential effectiveness concerning fishers´ heterogeneity was discussed.

It is concluded that considering the social practices of resource users may be an important contribution to design effective natural resource management instruments. The inclusion of sociology, as well as sociologically established theories and qualitative reconstructive methods, has led to practice-relevant insights how knowledge on human behaviour may inform management and mitigate bycatch.

Keywords: Fishers´ agency, Bycatch discourse, Bycatch mitigation, Fisheries management, Social-science fisheries research

Zusammenfassung

Der Mensch nutzt seit jeher die natürlichen Ressourcen des Meeres, mit verschiedensten Auswirkungen die Fischbestände und die Meeresumwelt. Ein Problem, das sich aus der Interaktion der Menschen, insbesondere der Fischer, mit dem Meer ergibt, ist das Verfangen von Meeresvögeln und -säugetieren in Fischfanggeräten, insbesondere in Stellnetzen, wodurch diese luftatmenden Tiere ertrinken. Diese Vorfälle werden als Beifang bezeichnet. Stellnetze haben allerdings eine lange Tradition in der Fischerei in der Ostsee und sind weltweit eines der am häufigsten verwendeten Fanggeräte. Der Beifang von Seevögeln und Meeressäugern in der Stellnetzfischerei stellt daher eine Gefahr für den weltweiten Naturschutz dar. Die bisherigen Maßnahmen zur Verringerung des Beifangs im Fischereimanagement beruhen meist auf technischen und ökologischen Erkenntnissen. Trotz der Bedeutung für ein effektives Fischereimanagement mangelt es daher oft an Wissen über die Heterogenität der Handlungspraxis und Motivationen von Fischern.

In dieser Dissertation wurde die deutschen Stellnetzflotte in der Ostsee betrachtet, um ein ontologisches Verständnis der sozialen Praktiken der Fischer zu entwickeln, das als Grundlage für das Management und die Entwicklung von Maßnahmen zur Beifangreduzierung und -vermeidung dient.

Die Soziologie der natürlichen Ressourcen bietet eine Perspektive, um dieses Forschungsanliegen zu erreichen. Die vorliegende Dissertation wendet die praxeologische Theorie der Strukturierung, erweitert um das Konzept der Handlungsfähigkeit (Agency), auf die Forschungsfragen an. Die qualitative empirische Forschung wurde mittels problemzentrierter Interviews durchgeführt, die mit der dokumentarischen Methode ausgewertet wurden. Ein Experten-Workshop zu politischen und administrativen Aspekten des Beifangmanagements ergänzte die empirische Forschung.

Aus praxeologischer Sicht und unter Anwendung des Konzepts der Handlungsfähigkeit (Agency) wurden drei Arten der dominierenden Handlungsfähigkeit von Fischern unterschieden:

(i) Fischer mit einer dominierenden projektiven (zukunftsorientierten) Handlungsweise planen langfristig, halten sich über aktuelle Entwicklungen in der Fischerei auf dem Laufenden und entwickeln teleologische Projekte.

(ii) Fischer mit einer vorherrschenden evaluativen (gegenwartsorientierten) Handlungsweise bewerten ständig ihre Situation neu. Evaluative soziale Praktiken sind nicht teleologisch ausgerichtet und zeichnen sich in der Fischerei eher durch Entscheidungen aus, die sich an aktuellen Situationen orientieren. Dies kann sich auch in abweichendem Verhalten zeigen

(iii) Fischer mit einer vorherrschenden iterativen (vergangenheitsorientierten) Handlungsweise zeichnen sich durch die Iteration bekannter Handlungsschemata aus, die

somit soziale Praktiken ständig reproduzieren. Solche iterativen Aspekte zeigen sich bei Fischern, die ausschließlich Stellnetze einsetzen.

Darüber hinaus ergab die Analyse der Beifangpraktiken zwei verschiedene Perspektiven auf Beifangereignisse: (i) Nicht-Normalisierung des Beifangs, vor allem in Bezug auf den Beifang von Schweinswalen, ist eine kritische Situation, welche die tägliche Routine unterbricht, während (ii) Normalisierung des Beifangs, vor allem in Bezug auf den Beifang von Seevögeln, als Teil einer Routine verstanden wird.

Bei der Anwendung des Wissens über die verschiedenen Fischertypen und Beifangpraktiken auf mögliche Managementinstrumente wurden zahlreiche Maßnahmen ermittelt, die von Fischereimanagern in Betracht gezogen werden können, und deren potenzielle Wirksamkeit im Hinblick auf die Heterogenität der Fischer diskutiert.

Schlussfolgernd ist zu sagen, dass die Berücksichtigung der sozialen Praktiken von Ressourcennutzer:innen einen wichtigen Beitrag zur Entwicklung wirksamer Instrumente für das Management natürlicher Ressourcen darstellen kann. Der Einbezug der Soziologie sowie soziologisch fundierter Theorien und qualitativer rekonstruktiver Methoden hat zu praxisrelevanten Erkenntnissen darüber geführt, wie das Wissen über menschliches Handeln ins Management einfließen und somit Beifang reduzieren kann.

Schlüsselwörter: Handlungsfähigkeit von Fischern, Beifangdiskurs, Beifangreduzierung, Fischereimanagement, sozialwissenschaftliche Fischereiforschung

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List of Abbreviations

ASCOBANS	-	Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas
CFP	-	Common Fisheries Policy
EA	-	Ecosystem Approach
EAF	-	Ecosystem Approach to Fisheries
EU	-	European Union
ICES	-	International Council for the Exploration of the Sea
MPA	-	Marine Protected Area
MSC	-	Marine Stewardship Council
MSY	-	Maximum Sustainable Yield
PAL	-	Porpoise Alert
PCI	-	Problem-centered interview
SES	-	Socio-Ecological-Systems
TC	-	Tertium Comparationis
UN	-	United Nations

"It doesn't help to hide it all and to lie. That's why I say, I catch whales with gillnets. I don't like it, I don't want it. I will do everything to mitigate it. That's for sure."[1]

(F18, paragraph 160)

1 Introduction

1.1 General overview

Earth is considered "the blue planet" and humanity has a long history of interaction with the sea. People have always been utilizing natural resources from the sea, and in order for us to continue to do so, these natural resources need to be managed sustainably. In terms of the sea, there are several prominent problems that arise from interactions humans have with nature. For example, there is overfishing, which means that fish stocks are harvested to an extent where they cannot produce enough offspring to keep the stock viable for future generations. There is also pollution of the sea with plastics or nutrients.

A not so prominent but equally important issue that arises from human interaction with the sea—specifically that of fishers—is the entanglement of marine birds and mammals in fishing gear, as a result of which these air-breathing animals drown. These incidents are called *bycatch*[2]. Some of these species are long-surviving animals with a slow population growth; therefore, bycatch can threaten especially the populations of these species. Fishing usually does not target bycaught animals, and therefore the fishing industry has no use for them, but they have to go to waste. Furthermore, like every animal, they have a role in keeping the ecosystem functioning and stable (Cox et al., 2007, p. 1156).

Because there are so many fishers around the world harvesting natural resources, and there is bycatch of different sorts in the process, they need to be managed, just like any natural resource, in order to be sustainable.

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[1] „Es bringt nichts äh (.) alles zu verstecken, und zu belügen. Deswegen, ich sage, ich fange Wale //hm// mit Stellnetzen. Ich fange sie ungern, ich will sie nicht fangen. (.) Ich werde alles tun, (2) um das zu vermeiden. (1) Ganz klar." (F18, paragraph 160)

[2] Bycatch in fisheries also refers to the catch of unwanted fish species or sizes, which are discarded into the sea after being caught. This is discussed primarily in terms of overfishing, sustainable resource use, or commercial value. In this dissertation the term bycatch solely refers to the bycatch of sea mammals and seabirds.

In the 1970s, the bycatch of small whales has been acknowledged as a problem by the International Whaling Commission (IWC, 1972, p. 10) and ever since then, there have been several agreements and acts that cover them as protected species, such as the U.S. Marine Mammals Protection Act (MMPA, 1972) or Annexes II and IV of the Habitats Directive (DIRECTIVE92/43/EEC, 1992).

In the Baltic Sea, small toothed whales are represented by harbor porpoises. Rough estimates suggest that there are about 1,300 to 3,000 individuals in the Baltic Sea, with a local bycatch rate of around 2% to 18%. These estimates show that bycatch is a threat to harbor porpoises in the German Baltic Sea, even if more precise estimates are needed (Scheidat et al., 2008, p. 215). Even low levels of bycatch can have a dramatic effect and contribute to the imminent extinction of certain species, such as the vaquita, a small-toothed whale similar to the local harbor porpoises, from the Gulf of California (Brownell Jr et al., 2019) p. 285. Regardless of the actual quantity of bycaught animals, bycatch can also be problematic for fishers because of their public perception, especially when endangered and charismatic species are involved (Campbell & Cornwell, 2008, p. 326).

Also in the 1970s, incidental catches of seabirds and associated mortality has received increased attention and the negative impact on population levels is much debated, making it a global conservation issue (Sonntag et al., 2012, p. 578).

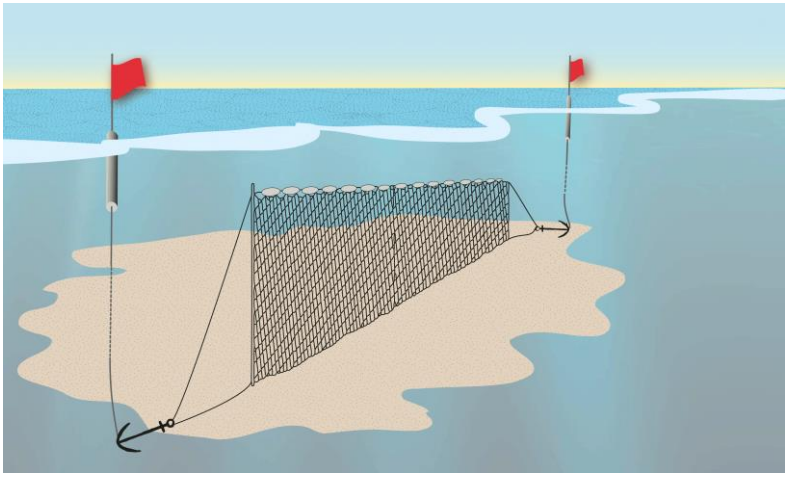
Seabird bycatch is meanwhile documented worldwide, including in all countries bordering the Baltic Sea (Sonntag et al., 2012, p. 578). In the Baltic Sea, diving ducks, such as the scaup and tufted duck, as well as sea ducks, such as the common eider and long-tailed duck, and cormorant are particularly affected by bycatch (Bellebaum, 2011, p. 14). As the Baltic Sea is an important wintering area for many seabirds, there is an increased risk of bycatch for them at this time of year (Sonntag et al., 2012, p. 583)

These species of birds and marine mammals, which live in coastal waters, are at risk for bycatch when their habitat coincides spatially and temporal with the gillnet fishery. Gillnets are considered the greatest threat to seabirds (Dias et al., 2019, p. 525) and one of the biggest threats to small toothed whales, such as the harbor porpoise (Reeves et al., 2013, p. 71).

Gillnets have a long history and tradition in fishing, dating back at least 3,000 years, while modern commercial fishing dates back to the mid-1800s in the Northwest Atlantic (He & Pol, 2010, p. 183). Gillnets consist of multiple panels of netting, which are set on the bottom and

stand wall-like in the water column (Fig. 1). Because of their wall-like structure, their thin netting and the resulting invisibility, both fish and air-breathing diving seabirds as well as marine mammals are at risk for being entangled in the nets and dying. Gillnets are considered highly efficient, simple, and versatile due to several reasons: they are low-cost and made with durable material (Pycha, 1962, p. 1085); they can be handled easily, set and retrieved by one fisher alone; and they do not need to be towed and are easily portable (He & Pol, 2010, p. 183). This led to a wide application of gillnets worldwide, and they are one of the most common passive fishing gears globally (He, 2006, p. 12). Gillnet fishing therefore has a fundamental contribution towards the income of millions of people, and the caught fish supplies nutrition as a protein source around the world (Waugh et al., 2011, p. 11).

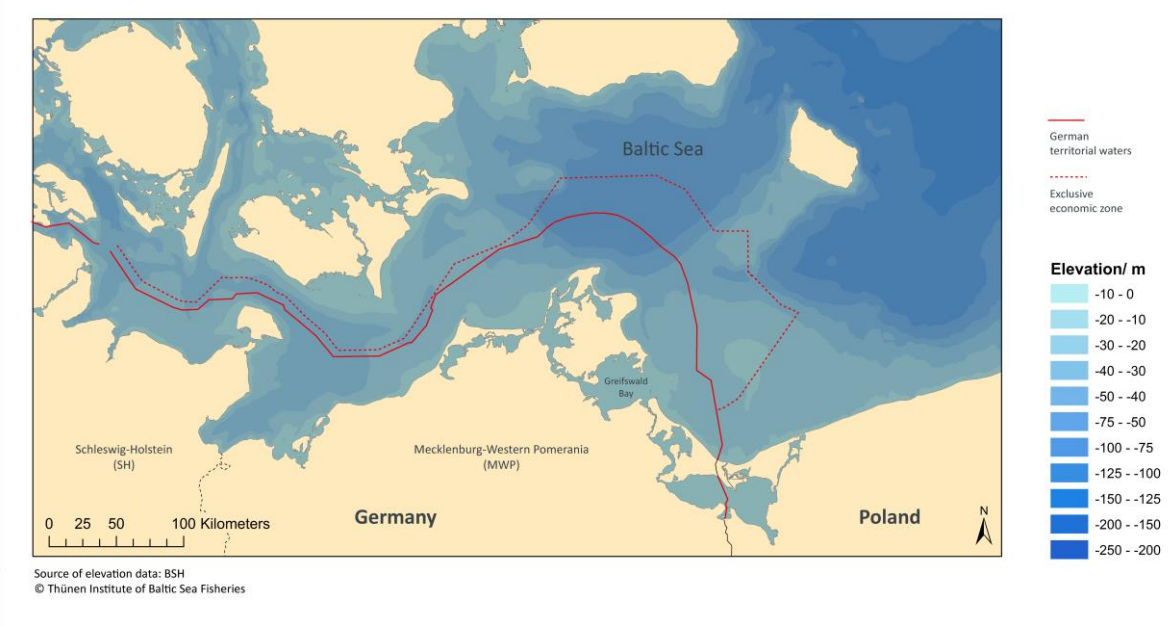
Figure 1: Anchored gillnet (©Annemarie Schütz, Thuenen-Institute of Baltic Sea Fisheries)



Gillnets are usually applied by “small-scale fishers”, a category that has been established by fisheries research and management in order to try to capture fishers distinct from “industrial fishers.” However, research shows that there is no common understanding of what small-scale fishery actually entails (Smith & Basurto, 2019, p. 236). In this study, small-scale fishery refers to vessels under 12 meters. In Germany, the majority of these vessels (which are mostly equipped with gillnets) operate close to the coast of the Baltic Sea. Figure 2 presents the border of the area under German management, which consists of the territorial waters (responsibility of the state) and the exclusive economic zone (responsibility of the federal government). The Baltic Sea coast is therefore a high-risk area for the interaction between gillnet fishers and seabirds and marine mammals. Germany has a comparatively small

coastline in the Baltic Sea. In 2016 they were 650 vessels operated by 486 owners[3] practicing gillnet fishing.

Figure 2: German Baltic Sea coast with the border of territorial waters and the exclusive economic zone (©Annemarie Schütz, Thuenen-Institute of Baltic Sea Fisheries)



The sheer quantity of fishers applying gillnets worldwide, including those with small catch yields, make their issues "too big to ignore" (Researchnetwork, 2021). Therefore, the resolution of the conflicts between fishing and conservation goals is of global importance.

[3] This figure is calculated from vessels that were registered in Germany, had landings along the German Baltic coast, and indicated in the logbook that their primary or secondary gear was a bottom set gillnet. Vessels were excluded where it was obvious that their provided information was incorrect— for example, if they only landed eel, which is not caught with gillnets (Source: Steffi Meyer, former Research Scientist at the Thuenen-Institute of Baltic Sea Fisheries, Rostock, Germany, May 30, 2021, 12:14 CET, oral communication with Fanny Barz).

S*ome bycaught species are protected under different regulations, such as the Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish, and North Seas (ASCOBANS) (ASCOBANS, 2012) and Flora Fauna-Habitat Directive (COUNCEL DIRECTIVE 92/43/EEC, 1992). This makes them directly relevant for conservation management and obliges EU member states to develop management instruments for the purpose of conservation* (Salomon *et al., 2014, p. 1)* (Barz et al., 2020, p. 1). In ASCOBANS the 10 European signatory states have committed themselves to maintaining small cetaceans (such as harbor porpoise) in a favorable conservation status or to bringing them to such a status. The management plan annexed to the agreement specifies concrete measures for this purpose, such as habitat conservation and management, survey and research, and legislation**.** Strictly speaking, it is asking that:

> "The parties shall endeavor to establish (a) the prohibition under national law, of the intentional taking and killing of small cetaceans where such regulations are not already in force, and (b) the obligation to release immediately any animals caught alive and in good health. Measures to enforce these regulations shall be worked out at the national level" (ASCOBANS, 2003, p. 7).

The different agreements and regulations show that bycatch mitigation is a supranational norm. These political entities demonstrate a political will to mitigate bycatch and are based on a normative classification, which categorizes bycatch of marine mammals and seabirds as something that needs to be avoided and is not socially acceptable. However, the absence of strong regulatory instruments can also imply a missing assertiveness of said political will.
The different public discourses on the significance of bycatch, including conservation perspectives, fisheries perspectives, and resulting political perspectives and political will, also show a conflict of power of interpretation. Such conflicts are not unique to the Baltic Sea, but can be found all over the world (Hilborn, 2007b, p. 297).

Several attempts have already been made to meet these protection agreements by developing technical or tactical measures to avoid bycatch (Eayrs & Pol, 2019). However, these approaches have only been successful to a limited extent due to a limited uptake of newly developed gear by fishers (Eayrs & Pol, 2019, p. 34).

According to Leenhardt et al. (2015, p. 49), the failure to take social sciences into account has led to this mismatch between targeted objectives and actual achieved objectives in fisheries

management. They find that the human use of nature is socially and culturally influenced, and therefore this relationship needs to be studied in order to develop a customized and effective resource and conservation management (Leenhardt et al., 2015, p. 49). Lidskog & Waterton (2016, p. 307) argue that social sciences need to find a prominent role in relation to natural and engineering science as a contributor to environmental knowledge. Poe et al. (2014, p. 166) determine knowledge and practices as one of five poorly understood key cultural dimensions of complex socio-ecological systems.

It has been recognized by supra-institutions such as the United Nations (UN), that social sciences can contribute importantly to environmental issues and knowledge (ISSC/UNESCO, 2013, p. 34) and therefore calls are being made for the social sciences not to be given a subordinate role in the framing of environmental and social change (Lidskog & Waterton, 2016, p. 307). From its reflexive position, sociology has the potential to reveal implicit paradoxes of the sustainability debate (e.g., in fisheries) beyond the explicit normativity of the concept and to highlight both politics of interest and barriers to intervention (Henkel et al., 2019, p. 5). For a long time, authors argued that there needs to be an ontological understanding of fishers and their operations and responses to regulations or incentives to design management instruments, and that most of fisheries' problems arise from the lack of them (Hilborn, 1985, p. 2). Ontologies are statements about the basic constitution and structure, about the dimensions and elements of a certain phenomenon or, in other words, the explicit or implicit conceptions of it. They are fundamental constitutions of a social phenomenon or, in this case, a professional group and professional action. This type of knowledge is also needed when researching the uptake of newly developed technology (Campbell & Cornwell, 2008, p. 332) as well as theorizing about social fishing practices from a sociological perspective.

This train of thought can be extended to natural resource sociology, which is interested in matters concerning effective resource management supporting socially responsible policy decision-making and therefore enhancing conservation (Buttel, 2002, p. 206). According to (Lockie, 2015b, p. 1), sociology needs to "ecologize" in order for it to stay valid and relevant. Human impact on natural resources is a fundamentally social phenomenon, as are human responses to environmental change (Lockie, 2015b, p. 1). In natural resource sociology the emphasis lies on "improving public policy, minimizing environmental impacts and conflicts, improving resource management" (Buttel, 2002, p. 207). Although Buttel (2002) claims that,

because of its application-oriented nature, resource sociology does not emphasize social theory, that is exactly where the strength of a sociology of natural resources lies: it enables theoretical and methodological rigor to be incorporated into the production of environmental knowledge (Lockie, 2015a, p. 140) and knowledge about actors and their interactions with the environment, particularly natural resources.

1.2 The case study: conflict around bycatch of seabirds and marine mammals in the German Baltic Sea

While above I presented a general overview of the problem of bycatch as well as the management practice connected to it, and localized the issue as a matter of interest to natural resource sociology, this section focuses on the local level and elaborates on the conflict around bycatch in the German Baltic Sea.

Research shows that bycatch of marine mammals and seabirds is afflicted with conflicts on different scales. Fishers might not share the awareness of bycatch being problematic (Moberg & Dyer, 1994, p. 164), especially if these concerns are not internationally shared. In Germany, this is the case with the eider duck, which is protected, and their bycatch needs to be mitigated in German territorial waters, whereas hunters in Danish territorial waters are allowed shoot them (Bird Life International & Dansk Ornitologisk Forening, 2016, p. 2). Such circumstances can also lead fishers to resent efforts spent on mitigation and conservation practices (Santora, 2003, p. 425).

Nevertheless, in a study conducted in Mecklenburg-Western Pomerania about actors involved in natural resource management and their potentially conflicting objectives, fisheries are perceived as the sixth threat (out of 19) to ecosystems (Lempe, 2016, p. 89). In this study, where stakeholders involved in resource management were asked about this, the perception of conservation authorities mostly contributed to this ranking (Lempe, 2016, p. 88). The author classifies bycatch as a sensitive and emotionally discussed topic concerning many different actor groups such as fisheries, conservationists, science and environmental consulting groups (Lempe, 2016, p. 91). Many environmental representatives see fishing gear, especially gillnets, as harmful to seabirds and marine mammals, whereas representatives of fisheries mostly deny the impact on the ecosystem. Whereas conservationists propose new fishing gear to mitigate bycatch, fishers argue that so far, no gear is available to properly substitute gillnets in order

to generate a comparable income (Lempe, 2016, p. 92). Lempe (2016, p. 91) identified, inter alia, one specific conflict in the region of the Greifswald Bay that arguably is also applicable to other areas in the German Baltic Sea, namely the conflict between interests of the gillnet fishery and nature conservation.

Previous projects in Germany tried to quantify bycatch (Bellebaum, 2011; Oesterwind & Zimmermann, 2013) or develop alternative fishing gear (Detloff & Koschinski, 2017), but could neither deliver reliable bycatch data nor have the results been specifically implemented in management. In Germany, the lack of reliable bycatch data is mainly due to the very high number of vessels in this fishery and comparatively rare but highly variable bycatch events, which make a statistically reliable extrapolation difficult (Oesterwind & Zimmermann, 2013, p. 34).

Although the fishing sector in Germany is highly regulated, unwanted behavior amongst fishers, such as bycatch of marine birds and mammals, is not (yet) part of a complex regulation. Nevertheless, the handling of unwanted bycatch has already been addressed by local legislation, demonstrating the political will on which further regulations on bycatch mitigation can be based.

There are three relevant instruments worth mentioning:

(i) One management instrument in the German Baltic Sea to avoid bycatch of harbor porpoises is the use of pingers, which alert harbor porpoises that there is an obstacle in their way and deters them from gillnets. However, only vessels bigger than 12 meters that fish east of Rostock are obliged to put these pingers on their nets. In 2020, only 12 vessels registered in Germany were bigger than 12m and fishing with gillnets. In 2019, their fishing effort in the Baltic Sea east of Rostock amounted to 25 hours, while in 2018 they fished for 53.5 hours.[4] This fishing effort was mostly directed at herring in the Greifswald Bay. Because herring is caught with a relatively small mesh size, harbor porpoises usually don't get entangled in these nets[4].

[4] Source: C. v. Dorrien (Senior Research Scientist at the Thuenen-Institute of Baltic Sea Fisheries, Rostock, Germany) (May 17, 2021, 15:01 CET): "Re: N Pingerpflicht?". E-mail correspondence with Fanny Barz

(ii) There is one local German law that touches upon the topic of bycatch: in Schleswig-Holstein, fishers are obligated to report bycatch of whales to the fisheries authority (Schleswig-Holstein, 2018).

(iii) There is also a voluntary agreement in place in Schleswig-Holstein *between gillnet fishers, their representatives, the Baltic Sea Information Centre of Eckernförde, and the Ministry of Environment. Fishers bind themselves to voluntary measures to mitigate bycatch of seabirds and harbor porpoises. It asks fishers, inter alia, to avoid feeding places of seabirds during wintertime, reduce their nets during summer time and use harbor porpoise alert devices (PALs)*[5] *in order to protect porpoises. It also states that fishers actively participate in monitoring these animals and the development of bycatch-mitigating gear (Landesfischereiverband Schleswig-Holstein et al., 2015).* (Barz et al., 2020, p. 9).

1.3 Objectives of the study

The aim of the study is to point out new approaches to bycatch-mitigating management by choosing a sociological approach. “Managing fisheries is managing people” (Hilborn, 2007a, p. 285). However, fishers are a heterogeneous group and different individuals may respond differently to management measures. For this reason it is necessary to understand fishers’ heterogeneity in terms of their social fishing practices, for example by developing a typology of their actions and behavior. The work is based on the hypothesis that even among fishers within a national border and within a specific fishery, there is heterogeneity concerning their social fishing practice. Social practices are understood, according to Giddens (1984, p. 25), as the social order of actions, which are characterized by the duality of structure and agency. Translated to the context of gillnet fishing, the term social fishing practice will be applied to characterize fishers’ actions in terms of their practices, motivations, and orientations. Social fishing practice is therefore understood as a more complex concept than “fishing practice,”

[5] PAL describes a harbour porpoise alert device that sends out “synthetically reproduced natural aversive communication signals of harbour porpoise” (Chladek et al., 2020, p. 2) to alert porpoises of an obstacle in their way. They have been an advancement over pingers, which send out artificial alerting sounds, which produce disturbing underwater noise and might even reduce the echolocation rate of porpoises, which in turn cannot locate gillnets anymore (Chladek et al., 2020, p. 2).

which in fisheries research usually consist of quantifiable characteristics, such as gear choice, including depth and length, fishing speed, and fishing ground (Tixier et al., 2015, p. 1610).

The social fishing practices of the gillnet fishers are on the one hand enabled and limited by structural conditions, such as fishing quotas[6] and available resources, and on the other hand fishers reproduce and modify their practices through their agency, which then reproduce or modify the structures (cf. chapter 3.2.1 & Fig. 3).

It can be expected that different social fishing practices in general and in relation to bycatch, meaning the heterogeneity of fishers, has a decisive influence on the response to different policy measures to avoid bycatch. However, this assumption has rarely been considered in actual policy instruments (Carlson et al., 2020, p. 238). One reason for this may be the lack of ontological knowledge on how local fishers act and deal with bycatch, and thus a potential heterogeneity cannot be incorporated into management at all. Another reason could be that, in a next step, fisheries management might not be designed to include heterogeneity at all. Nevertheless, there are several research studies that internationally laid a foundation for describing and applying different typologies of fishers (e.g., Boonstra & Hentati-Sundberg, 2016), dealing with different research objectives, but they did not focus on bycatch of seabirds and marine mammals (cf. chapter 2.3).

This dissertation aims to fill these gaps by determining the orientation frames of fishers regarding their professional social practice as well as regarding their handling of bycatch, thus showing their heterogeneity. A praxeological view using Giddens' theory of structuration (Giddens, 1984) will be applied as a starting point and further develop concepts such as agency and the ecosystem approach to management to focus the research and explain the results in the complex context of fisheries management. Findings on fishers' heterogeneity will be interpreted in the context of essential policy instruments for natural resource management in order to develop specific recommendations for a more bycatch-mitigating gillnet fishery in the German Baltic Sea.

This study addresses the question of how effective bycatch-mitigation strategies can be designed in the German gillnet fishery in the Baltic Sea. This thesis wants to contribute to the

[6] For an explanation of fishing quotas cf. chapter 1.4.2.

research body and discourse of natural resource sociology, which deals with the rather application-oriented research related to our natural resources (Buttel, 1996).

To this end, this dissertation wants to answer the following research question:

How are the social fishing practices of the gillnet fishers in the German Baltic Sea constituted and how can the ontological knowledge about social fishing practices be applied to inform bycatch-mitigation management as a special form of natural resource management?

To answer this research question, the following sub-questions will be answered:

1. Which external influences and orientation frames can be reconstructed as action-guiding and how are they negotiated by fishers? What different types of social fishing practices in general result from this? What do fishers construct as enabling and as constraining for their social fishing practice?
2. How can bycatch of seabirds and mammals be described as part of social fishing practices?
3. Which possible management approaches are there for mitigating bycatch and how can knowledge about different social fishing practices and bycatch practices help inform bycatch-mitigation management?

Firstly, the fundamental focus will be to create an ontological understanding of gillnet fishers and their fishing practice in the German Baltic Sea. As will be shown, there has been some previous research into different types of fishers as well as reasoning why it is important to differentiate a group of agents that needs to be managed. Besides the similarities of these typologies, the review of them will also show that developed types depend much on the research question asked. Context always matters, as it does in the case of bycatch research (Hall et al., 2007, p. 282). This ontological understanding will then be applied to political theory of natural resource management instruments and conclusions about bycatch management will be drawn.

This study was conducted in a management-oriented paradigm as part of a holistic research approach, contributing to the understanding of how the system of gillnet fishing and bycatch in the German Baltic Sea works (Goethel et al., 2019, p. 1896). Besides this application-focused approach, this thesis wants to contribute to the growing body of sociological literature researching the interaction of people with natural resources and develop a theoretical

understanding of social fishing practice, and especially bycatch practice, that can also be transmitted to other contexts.

1.4 Background of the study: fisheries management, the gillnet fishery in the German Baltic Sea, and the project context of the study

1.4.1 Fisheries management

Since one objective of this thesis is to develop suggestions on bycatch-mitigating management instruments the following chapter provides an overview on how fisheries management is currently organized and is complemented with insights into institutional and governance studies, which assess the current fisheries management.

To avoid the *Tragedy of the Commons* (Hardin, 1968, p. 1243), fisheries management has been established to regulate access to the common pool resource of seafood (Goethel et al., 2019, p. 1895). Hardin argues that if users have unrestricted access to resources, they will exploit these resources out of self-interest and because they act independently. This will then lead to a collapse of the resource through overuse, such as overfishing (Hardin, 1968). However, Ostrom (2011) has shown several examples where communities are indeed able to manage their resources successfully without institutional guidance or without overusing the resources. The emergence of political distribution conflicts usually takes place between clearly definable interests of the causer and diffuse interests of proponents. The intensity of these conflicts can be influenced by the choice of political instruments (Böcher & Töller, 2012, p. 91). Böcher and Töller (2012) argue, however, that in environmental policy, environmental interests are often subject to economic interests, and environmental policy goals are therefore weakened during political processes (Böcher & Töller, 2012, p. 92).

In the European Union fisheries are managed through the Common Fisheries Policy (CFP) (Regulation (EU) No 1380/2013, 2013). Since it came into force, the European Union has had more and more regulatory powers (Böcher & Töller, 2012, p. 162). However, environmental policy is a shared responsibility, and wherever the EU law leaves gaps, the member states can shape their own laws (Böcher & Töller, 2012, p. 162). There are various ways in which European politics can influence national law, including through the redefinition of problems and the dissemination of innovative approaches, which are then reflected in the member

states through learning processes (Böcher & Töller, 2012, p. 167). Different paradigms underlie the fishery policy of the EU: conservation paradigm, rationalization paradigm, and social/community paradigm (Jensen, 1999, p. 10). The conservation paradigm is based on biological management of seafood, which examines the maximum sustainable yield (MSY) of seafood that can be extracted from the sea. For a number of stocks total allowable catches are issued, which manifests as quotas in fishing practices (Jensen, 1999, p. 11). Rationalization is based on the objective to maximize economic wealth and therefore explores how much biomass can be exploited for long-term economic well-being (Jensen, 1999, p. 12). The social and community paradigm presents theoretical fisheries concepts that are part of management. It leads to an inclusion of social and cultural conditions, which is where this thesis finds it link to the CFP. It completes the rationalization and conservation paradigms by including the institutional framework of a community and ensuring the consideration of local interests and specifics (Jensen, 1999, p. 13). Although the CFP has incorporated aspects of ecosystem-based approaches, it is under-considering socio-economic as well as governance aspects (Ramírez-Monsalve et al., 2016, p. 84). The CFP forms the basis for many topics discussed later on, such as subsidies for fishers or quotas and their fluctuations. In its current form it mostly works with top-down regulatory approaches and does not leave much room for bottom-up approaches such as institutionalized co-management, which has been shown to support sustainable developments (Hilborn et al., 2004, p. 504).

The comprehensive CFP was first implemented in 1983 and has undergone revisions and reforms since then (1992, 2002, 2013) with a major focus on conservation unlike former agreements on fishing in the EU (Jensen, 1999, p. 15). It has been critically reviewed numerous times for different reasons, such as collapsing of stocks, implementation problems with, for instance, landing obligations, or low profitability of small-scale fisheries (Belschner et al., 2019; Jensen, 1999; Raakjær, 2011). Reasons for failures within the CFP are inter alia: lack of enforcement in member states, different views of managers and fishers concerning the goal of the CFP, the introduced type of co-management did not lead to responsible behaviour and `one size fits all´ approaches are applied (Raakjær, 2011, pp.106), which is where this thesis follows up. In order to further improve the CFP, studies discuss its potential to solve current fisheries-management problems (Salomon et al., 2014) or develop an extensive framework in order to evaluate the performance of the CFP and therefore improve it in future reforms (Belschner et al., 2019). The CFP regulates most of the everyday activities of fishers in a top-

down approach: it specifies inter alia, where, when, and how fishers are not allowed to fish and which and how much of a target as well as non-target commercial species they can fish. Yet, the CFP does not sufficiently regulate the unwanted bycatch of seabirds and marine mammals directly. However, under the Birds Directive (Directive 2009/147/EC, 2009) as well as the Habitats Directive (Council Directive 92/43/EEC, 1992) member states are obliged to implement protection measures to ensure conservation goals in the waters under their jurisdiction.

Fisheries-management systems have been studied to answer questions concerning the governance and institutional perspective. Studies researched how successful different fisheries-management structures work and which factors make them successful in managing economically relevant species, especially in a small-scale fishery (such as gillnet fishing) context. Successful management structures range from local cooperatives to different forms of property rights and to strong governmental control. They generally include institutional schemes that offer incentives to vessel operators to change their behavior consistent with conservation goals (Hilborn et al., 2005, p. 47). Enduring self-governing common resource institutions have eight factors in common: congruence between appropriate rules and local conditions, clearly defined boundaries, collective-choice arrangements, monitoring, graduate sanctions, conflict-resolution mechanisms, and minimal recognition of rights to organize and nested enterprises (Ostrom, 2011, p. 90). Besides a vast body of literature supporting these principles empirically (for an overview see Cox et al., 2010) other factors for successful management have been identified. They include: having rather small organized groups (Agrawal, 2001, p. 1659), strong leadership as well as individual or community quotas (Gutiérrez et al., 2011, p. 386), high dependence on the resource, leadership, social capital such as trust and reciprocity, monitoring of the ecosystem (Basurto et al., 2013, p. 1368), access regulation via a tenure system and simple regulations (Ernst et al., 2013, p. 1381), co-management (Gutiérrez et al., 2011; Jentoft et al., 1998), and especially adaptive co-management with its core features of

> "innovative institutional arrangements and incentives across spatiotemporal scales and levels, learning through complexity and change, monitoring and assessment of interventions, the role of power, and opportunities to link science with policy" (Armitage et al., 2009, p. 95).

However, empirical interpretations of adaptive co-management vary (Plummer et al., 2012, p. 2). While these results should be considered when developing tools, it is important to keep in mind that these factors are situation specific (Armitage et al., 2009, p. 96) and that they are success factors related to the sustainable management of economically relevant species in fisheries, not the management of unwanted bycatch of protected species.

1.4.2 Gillnet fishing in the German Baltic Sea

When considering the gillnet fishery in the Baltic Sea, different social historical developments in the region and the probable influence on today's fishers and their practices need to be kept in mind. The history of the small-scale fishery in Mecklenburg-Western Pomerania is better documented than the history in Schleswig-Holstein. In the German Democratic Republic (GDR, which existed until 1990), fishers did not need to concern themselves with selling their fish; it was sold for them by the state-organized "Fischhandel Berlin," which had a GDR-wide distribution network to receive and market fish. Therefore, most of their work was finished after bringing the fish to shore and preparing for the next fishing trip (Steusloff, 2006, p. 221). The 1990 and 1991 cooperatives, which were oriented towards the market economy, were newly founded and are still part of the fishery in the Baltic Sea (Steusloff, 2006, p. 227). Here, fishers become members and jointly take over the organization of their fishery and the harbor by, for instance, running a cooperative shop or a filling station for the vessels. Each cooperative operates differently: while some cooperatives do not allow direct marketing by fishers (e.g., Wismar), in other regions, selling fresh and processed fish directly to private customers has become an important source of income to fishers, because it will generate a higher price than selling directly to the cooperative (Steusloff, 2006, p. 233). In addition, fishers must be members of a producer organization in order to receive EU funding (Landesverband der Kutter- und Küstenfischer, 2021).

In the course of restructuring after the political changes in 1989, scrapping bonuses were established and have been reoccurring ever since in order to downsize fishing pressure. This means that depending on the size of their vessel, fishers get a certain amount of money if they scrap their vessels so that they will no longer be fishing at all. From 1991 onward, there were a lot of political changes challenging fishers in Mecklenburg-Western Pomerania as well as Schleswig-Holstein: new EU-regulations, restrictive quotas, closed seasons and ecological

sanctuaries, a strong price decline in herring, the decline of cod abundance and corresponding management plans, high credit-payments for many vessels in order to pay for retrofitting costs for vessels that went from trawling to gillnetting, potential exclusion from marine protected areas, and local fishing losses due to the increase in the cormorant population, which itself is protected as a species (Steusloff, 2006, p. 230). According to Steusloff (2006), as a consequence, fishers changed livelihoods and found new employment, sometimes in a related field like recreational fishing tours.

In order to become a fisher in coastal waters, apprentices need to complete a three-year traineeship. To be allowed to target species such as herring or cod, young professionals need to be licensed and inherit or buy a vessel that has a quota for these species bound to them. This requirement can be expensive and potentially makes it difficult for young fishers to start their own business. Currently, decreasing quotas, overfishing, and other issues make it nearly impossible to get a bank loan to start a new business. Considering the objective of this research it is relevant to examine the framework curriculum for trainees (Kultusminister Konferenz, 2015). The curriculum includes environmental and nature conservation as a small part of fishers' education. To be informed about changing legal regulations is also part of the trainees' education.

Currently there are several commercially relevant species in the Baltic Sea that are restricted under a quota management, such as herring and western Baltic cod (ICES, 2021a). Currently the International Council for the Exploration of the Sea (ICES) is one of the main scientific sources for the stock assessment and advice on the total allowable catch for living resources in the Baltic Sea. Scientists from different countries assess the biological state of fish based on scientific cruises and commercial catches and calculate different harvest scenarios for the next fishing season. The latest recommendation from May 2021 suggests that herring should not be actively caught at all (ICES, 2021b). However, these scientific advices are subsequently discussed by EU-fishing ministers, who then decide how the scientific advice will be reflected in the actual quota given out to fishers each year. Nevertheless, fishers can also target species without a quota, such as flounder and dab.

While in other countries small-scale fishers have an important contribution to their country's economy (Waugh et al., 2011, p. 31), this is not proven for the economy of the German federal states along the German Baltic Sea. The trade association for traffic, under which fishers in

Germany have to be registered, calculates a yearly average income for fisheries with vessels more than 80kW and with restricted travel areas[7] to be 12.055 € for self-employed coastal fishers (Berufsgenossenschaft Verkehr, 2016, p. 24). Since there can be severe fluctuations in quotas, and quota-unregulated species alone do not necessarily provide a solid income, most fishers agree that another source of income is necessary. Complementary livelihood approaches range from direct marketing and refinement of the catch to operating holiday apartments (Steusloff, 2006, p. 231).

Small-scale fishery, besides having an economic value in big parts of the world for providing livelihoods for fishers and others in the industry and thereby reducing poverty (Barnes-Mauthe et al., 2013, p. 175), also has an indirect, cultural importance. In so-called "fishing communities" fish and fishing are carriers of shared values and identity in those communities. Research shows that in some areas, fishing can also determine identity and community as a commodity to economic success rather than as a carrier of local identities (Allegretti, 2019, p. 49). Small-scale fisheries can provide ecosystem services in the form of historical and identity values as well as contribute to tourist attraction (Pellowe & Leslie, 2021, p. 594). However, as these two mentioned studies show, the value or meaning of a small-scale fishery for a region or a community depends very much on the context. In the context of the German Baltic Sea, the value of small-scale fisheries has not been holistically researched.

1.4.3 Project STELLA

The research for this dissertation was conducted during a third-party project at the Thuenen-Institute of Baltic Sea Fisheries[8] in Rostock, Germany[9]. The aim of the STELLA project was to develop bycatch mitigation measures from multidisciplinary perspectives for gillnet fishers in the German Baltic Sea. In order to understand the context of this thesis, research was

[7] which are mostly gillnet vessels, who dominantly operate in the Baltic Sea

[8] The Thuenen Institute of Baltic Sea Fisheries is a federal research institute that develops scientific foundations for the work of the Federal Ministry of Food and Agriculture and is part of its portfolio. The work of this federal research institute contributes essentially to securing and sustainably using natural resources and thus to safeguarding the quality of life of the population. The research is intended to provide an optimal basis for political action. Accordingly, the results of the work at the Thuenen-Institute provide policy advice and are incorporated into guidelines and norms as well as regulations (www.thuenen.de).

[9] This work was supported by the German Federal Agency for Nature Conservation [Bundesamt für Naturschutz, project no. 3516821300, Entwicklung von alternativen Managementansätzen und Fangtechniken zur Minimierung der Konflikte zwischen Stellnetzfischerei und Naturschutzzielen in der deutschen AWZ der Ostsee – STELLA].

conducted to understand the issue of bycatch within the gillnet fishery in the German Baltic Sea. During the project, four work packages conducted research in different disciplines to develop bycatch mitigation strategies. Specifically, they aimed to characterize the active fleet in the German Baltic Sea, improve data of fishing efforts as well as bycatch, develop modified gillnets as well as alternative gears, and characterize fishers as part of the management system to identify incentives and constraints for bycatch-mitigating fishing behavior.

During the project, there were several project meetings, which included public events where stakeholders were informed about the progress of the project. This was opportunistically used for an expert workshop on bycatch mitigation measures, the results of which could then be incorporated into the analysis of this work.

In general, there are divergences in different theories of sustainability transformation regarding the role of citizens (in this case fishers) and consumers, the role of technology, burden sharing, or transformation modes (Henkel et al., 2019, p. 13). However, the role of the fishers was already provided in the STELLA project. Through the project structure, the responsibility to transform their actions through appropriate incentives and through the uptake of new technological developments is seen primarily with the gillnet fishers. This results in the necessity to describe and understand fishers' social practices and therefore inform management within the fourth working package of the project, on which this thesis is based.

Other collaborators in the STELLA project did some work that contributed to this thesis. This is indicated where necessary. Furthermore, a publication emerged from the project (Barz et al., 2020). It is referred to in this thesis and quoted in a few places - this is indicated with italics in addition to the reference.

1.5 Structure of the study

After introducing bycatch as an important issue in gillnet fishing, stating the objectives of the study and providing relevant background information, the following overview presents the structure of the presented thesis.

An in-depth literature research was conducted to deduce the current social science body of knowledge on questions related to fisheries research in general (cf. chapter 2). In relation to

the research questions, research on fishers' compliance with management (cf. chapter 2.1.1) as well as associated incentives to change fishers' behavior were studied (cf. chapter 2.1.2). This was complemented by studies researching fishers' attitudes and perceptions in connection with various topics (cf. chapter 2.1.3) as well as studies that introduced different fishers' typologies (cf. chapter 2.1.4). Additionally, at the end of this chapter, the literature provides valuable insights on bycatch mitigation approaches in fisheries management (cf. chapter 2.2.).

In chapter 3, different theoretical research perspectives and concepts that shaped this thesis are presented. Natural resource sociology as a contemporary branch of sociology is introduced in more detail (cf. chapter 3.1). Subsequently it is argued that a praxeological approach is able to focus the research question on social fishing practices (cf. chapter 3.2.). Therefore, theory in structuration is presented in more detail (cf. chapter 3.2.1-3.2.9) and elaborated as well as completed by the concept of agency by Emirbayer and Mische (1998) (cf. chapter 3.2.8) as well as by a brief comment on how actor-network theory (Latour, 2001) can complement the shortcomings of structuration theory (cf. chapter 3.2.10). Furthermore, in order to then focus on informed management measures, different generic environmental management instruments are elaborated upon, which allows to serve as a template to evaluate different management instruments based on the empirical results of the study (cf. chapter 3.3.). The chapter closes with an introduction of the paradigm of the ecosystem approach to management, which offers a framework to include social sciences into fisheries management (cf. chapter 3.4.).

Chapter 4 elaborates on the empirical research process that included interviews with fishers and an expert workshop. The chapter reports on the selection of fishers (cf. chapter 4.1.1) as well as the problem-centered interviews that were conducted to identify different social fishing practices as well as different bycatch practices (Witzel, 2000) (cf. chapter 4.1.2). The interviews were analyzed by applying the documentary method, which is presented from a theoretical and empirical point of view (Nohl, 2013) (cf. chapter 4.1.4). Natural resource sociology works with a body of different empirical approaches, and structuration theory offers no specific methodology, which is why parallels between both theoretical framings are drawn out in this chapter as well. The process behind the expert workshop that was conducted to evaluate current and possible mitigation measures from other stakeholders is explained (cf. chapter 4.2.).

Subsequently, the results of this study are presented in chapter 5. Firstly, categories and their different characteristics are unfolded, which later are synthesized into a typology of fishers' agency, as the social fishing practices are described (cf. chapter 5.1.). Afterwards, another typology to address different bycatch practices is addressed and elaborated upon against the background of the stratification model rooted in structuration theory (Giddens, 1984, p. 5) (cf. chapter 5.2.). This is followed by results of the expert workshop held, where different management measures to avoid bycatch were discussed. The obtained results, referring back to the political instruments as presented in chapter 3, are combined suggestions on concrete management options that can be implemented to avoid bycatch (cf. chapter 5.3.).

The thesis is concluded with a summary as well as a discussion of the results in chapter 6, where limitations of the dissertation are discussed and further research questions of interest are developed to constantly deepen the understanding of human-nature interaction and social practices of resource users that need to be managed sustainably.

"A fisher wants to go out to sea.
He wants to see the sunrise.
He wants to be free.
Just do his work.
Go home with fish." [10]

(F7, Paragraph 156)

2 Social science and bycatch mitigation in fisheries literature

The opening quote from F7 presents a fairly romantic and almost cinematic picture of fishers. How much of that romantic picture of a fisher is actually researched? Social sciences as well as research studying bycatch mitigation have already been engaged in fisheries research on a large scale. After having introduced the background of this study and elaborated upon its objectives in the previous chapter, an overview will be given about the relevant research already done in the social science area of fisheries as well as bycatch mitigation in this chapter. Based on the question, it is assumed that background knowledge on the following points will be relevant to achieve the objectives: approaches that aim to understand fishers' actions in terms of (i) compliance, (ii) incentives, (iii) their attitudes and perceptions as well as approaches that developed, and (iv) different typologies of fishers, showing their heterogeneity, will be reviewed. The review is completed by delivering insights into bycatch mitigation studies out of not only a social science perspective, but also technical and tactical perspectives. The research results reviewed in this chapter served as prior knowledge about fishers as well as about bycatch mitigation, which was considered in the development of the objectives in the study as well as during the preparation of the collection and analysis of the empirical material. In the following, the potential aspects of social fishing practices that have already been illuminated in studies will be shown in order to subsequently show that the study presented in this thesis fills a research gap.

[10] „Ein Fischer will auf See fahren. Er will den Sonnenaufgang sehen. Er will frei sein. Einfach seine Arbeit machen. Mit Fisch nach Hause fahren." (F7, Paragraph 156)

2.1 Social science research in fisheries literature

2.1.1 Fishers' compliance with management regulations

Compliance is a popular research topic and offers some insights about incentives set to induce compliant behavior. Hønneland (1999) built a model to elaborate on fishers' compliance based on literature. He identified discursive and coercive instruments as the main mechanism to reach compliance. In a subsequent case study, Hønneland (2000) was looking for explanations for a generally high compliance of fishers with rules based on the expertise of fishers themselves. He identified the legitimacy of the management body and the respectful attitude of inspectors as a main factor for compliance and states explicitly that the amount of surveillance is a less important factor (p. 11). Bisack and Das (2015) also developed a model focusing non-compliant behavior of fishers in a harbor porpoise bycatch study, where fishers have been obliged to attach pingers for 10 years to their gillnets by the time the study was conducted. Model results indicate that previous violations of the regulation, a low chance of being detected, and a relative independence on gillnets encourages non-compliance (p. 1).

As a new turn in compliance research, Hatcher et al. (2000) investigated non-monetary factors as opposed to purely economic factors, which affected compliance with quotas among UK fishers. Their findings suggest that participation of fishers in regulatory processes, such as designing and implementing measures, leads to a higher compliance. Furthermore, social influence and norms were also identified as having a positive influence on compliance as well as some flexibility in in management to adjust incentives to changing output expectations (Hatcher et al., 2000, p. 459). Raakjær Nielsen (2003) incorporated these findings into his framework for studying compliance. The framework distinguishes industry structure, control and enforcement, and internal obligation as factors related to compliance (p. 426). Based on this framework he conducted a case study with Danish fishers to identify factors influencing their compliance with fisheries management, presenting five factors: *"(1) the economic gains to be obtained; (2) deterrence and sanctions; (3) compatibility between regulations and fishing practices and patterns; (4) efficacy of imposed regulations; (5) norms and morals of the individual fisher"* (Raakjær Nielsen & Mathiesen, 2003, p. 409). Furthermore, they indicate that if fishers perceive themselves as participating in decision-making processing, they are more likely to comply with those rules (Raakjær Nielsen & Mathiesen, 2003, p. 409). Most studies (and all of the studies presented above) on compliance assume a dichotomy of fishers'

decisions—they either follow the rules or they don't—and then ask for the reasons behind those dichotomous decisions. Boonstra et al. (2016) on the other hand establish a more continuous concept of compliance, allowing for different types of motivational postures: (i) creativity, (ii) commitment, (iii) resistance, and (iii) reluctance. Whereas commitment and resistance will lead to compliant and non-compliant behavior, respectively, creativity and reluctance are not as predetermined and both can lead to compliant or non-compliant behavior (Boonstra et al., 2016, p. 7).

2.1.2 Incentivizing fishers' behavior

Research on compliance is often connected to research on incentives. Their application aims at encouraging compliant behavior.

Incentives are mostly categorized as something positive like a reward, but they can also be implemented as negative incentives in the form of sanctions. These types of incentives are discussed by many authors in the context of fisheries. Young et al. (2008) divide incentives into four categories: (i) socio-cultural, (ii) economic, (iii) legal, and (iv) institutional (p. 38).

(i) Socio-cultural incentives are understood as social pressure provided by a peer-group, family, or other people fishers are socially tied to, gender relations, social preferences, norms, values, rules, ethics, social recognition, and common interest as well as motivation for fishing (Young et al., 2008, p. 38). Social pressure and the behavior of others is a source of compliance (Hønneland, 1999, p. 707). In that line of argumentation Garza-Gil et al. (2015) suggest the sanctioning of defaulters and rewarding of compliers, which is valued positively by fishers (p. 30). The fine line between social pressure and shaming should be observed. Social incentives can also be a form of community program such as community stewardship actions or resilience programs. Especially in countries of the global south alternative livelihoods are widely discussed (Young et al., 2008, p. 119) as incentives to minimize fishery pressure, which could be transmitted to the pressure on bycaught species as well. Finally, Murillas-Maza and Andrés (2016) argue that social incentives are provided when fishers are made part of decision-making processes (p. 129).

(ii) Economic incentives: When looking for ways to influence fishers' actions monetary incentives come to mind quickly. This might certainly be one way to encourage

behavioral changes, but will most probably not work on its own and not with every type of fisher. Salas and Gaertner (2004) conclude that "fishers operating in unstable fisheries are less likely to have profit maximization goals, and more likely aim only to obtain enough revenue to cover travel costs, situations also observed in some small-scale fisheries" (p. 156). Although models of fisher's behavior often assume a priori that fishers work to maximize their profit, a review by Abernethy (2010) confirms that profit is not the only motive for fishing (p. 46). Furthermore, financial incentives usually only have a short-term effect, and there have been times where they did not achieve their objective at all (Socioec, 2013, p. 5).

(iii) Legal incentives are regulations from the state are rules and laws, as represented by the CFP. Enforcement of these rules and laws is for most fishers the main intersection with fisheries management (Eliasen et al., 2014, p. 1301). Informal and formal communication structures, such as advisory groups, can also be classified as legal incentives for fishers (Eliasen et al., 2014, p. 1301).

(iv) Institutional Incentives can be rights-based incentives for fisheries, such as individual harvesting rights, as well as community- or group-based rights or territorial user rights (Hilborn, 2007b, p. 296).

2.1.3 Attitudes and perceptions of fishers

In several studies, fishers' attitudes and perceptions, mostly towards fisheries management, were studied with qualitative and quantitative methods.

Silva and Lopes (2015), regarding the perception on the management tool of Marine Protected Areas (MPAs), discovered, inter alia, that younger fishers as well as fishers who apply selective gear are more prone towards a positive perception of conservation (p. 347). Pieraccini and Cardwell (2016) identify history, power relations, and risk as variables that can explain divergent legal consciousness, which expresses itself in opposing attitudes of fishers towards the establishment of MPAs (p. 21). Other authors researched the perception of fishers towards the performance of MPAs (Leleu et al., 2012; Pieraccini & Cardwell, 2016; Silva & Lopes, 2015).

Another specific management study asked for preferences of fishers for different forms of fishing rights, concluding, inter alia, that artisanal fisheries prefer an individual effort system to a quota system (Garza-Gil & Varela-Lafuente, 2015, p. 291).

Pita et al. (2010) aimed at increasing the participation of fishers in a new fisheries management regime through identifying their perception of participation. Most fishers did not perceive themselves to be involved in the decision-making process. Nevertheless, they held an overall positive attitude towards the implementation of the new management regime (p. 1093).

Research on attitudes towards fishing as a profession showed that the most important attribute for fishers is independence (Hanna & Smith, 1993, p. 369). Their study also describes how fishers perceive fisheries management: most of them view fisheries management procedures as problematic, an attitude increasing with the age of the fishers (Hanna & Smith, 1993, p. 371).

To conclude on this enumeration, one more relevant study on fishers' perceptions will be mentioned: Gelcich et al. (2008) studied how co-management affected fishers' perceptions depending on how long they have been engaging in fishing. Results show that with an increase in the length of time that fishers engage in co-management, they gained a better understanding of the ecological problem and increased their conservation-oriented ethic (p. 36). The authors conclude that managers need to be patient and invest time in order to overcome mistrust and educate participants in co-management processes (Gelcich et al., 2008, p. 36).

2.1.4 Fishers' typologies

Research targeting the human dimension suggests that fishers are not a homogenous group and their heterogeneity can yield decision-relevant information to managers (Gelcich et al., 2007; Quynh et al., 2018; Silva & Lopes, 2015). One strongly researched field is that on different fishing tactics or fishing strategies. Research on so called fishing practices, fishing métiers, or fishing profiles establishes a heterogeneity on different types of vessel activities and is usually limited to data based on landing records, mainly fishing gear and target species (Deporte et al., 2012; Ulrich & Andersen, 2004). These data allow for conclusions on vessel activities and can contribute to the complex representation of types, but give no insight into

the fishers' social fishing practices underlying these activities. Therefore, this paragraph focuses on typologies that establish the heterogeneity of (mostly) coastal fishers from a social-science perspective (Table 1). Since one of the main objectives of this research is to develop a typology of social fishing practices amongst gillnet fishers, this chapter is elaborated upon in more detail in order to distinguish this work from previous research and also to interpret findings in light of prior research.

Table 1: Overview of social science typologies of fishers - following pages -

Study	*Typology*			
Smith & McKelvey (1986) *Typology according to capability to deal with market and nature variability*	**Specialists** • Focus specific fishing ground and method • Inflexible if changes occur	**Generalists** • Switch between gears, target species and other activities than fishing easily		
Creative Research (2009) *Typology according to approaching and dealing with the uncertain future*	**Leaders** • vessel owners • strategic and business-oriented actions, • looking proactively for solutions for problems • rather higher earners • are seen as a natural leader in their community	**Lieutenants** • most likely vessel owners • less business oriented than leader • keep informed with information directly of concern • tend to react to events, not proactively anticipating • inward focus	**Followers** • mostly hired crew • and / or have hardly ever changed fishing practice	
Christensen & Raakjær (2006) *Typology of strategic decision-making process in terms of investments and fishing tactics*	**Type A** • conscious about expenses • invest little into equipment and vessel • stay relatively close to the harbor • very flexible: multiple target species and changing gear	**Type B** • nomads, who are at sea for longer periods • apply preferred gear • keep informed about latest technology • have a network of peers to keep aware of fishing opportunities • not big risk takers in terms of investments	**Type C** • risk takers • spend very long times at sea • objective to create great revenue • own large vessels • arrange big investments • are highly efficient • easily take up on new inventions to improve their fishing practice	
Abernethy (2010) *Typology of strategic decision-making process*	**Prospectors** • come from fishing families	**Defenders** • not flexible in target species, fishing grounds or gear	**Analyzers** • risk averse, but not as much as defenders	**Reactors** • non-vessel-owners • don't change fishing gears or fishing grounds

	• are flexible in terms of their target species, fishing gear and fishing grounds • often on nomadic fishing trips • try to anticipate future developments to improve capacity for adaptability	• rather not interested in implementing innovation • not easily able to adapt to changing conditions	• flexible in their fishing strategy, but not as much as prospectors • only invest in technology with proven efficiency • have a greater ability to adapt to changing conditions, but are not as flexible as Prospectors	• are unlikely to adapt to changing conditions • would give up fishing if another job-opportunity occurred
Boonstra & Hentati-Sundberg (2016) *Typology of fishing styles*	**Archipelago** • risk averse towards investments • have no debts and little costs • have additional jobs and rely on another household income	**Coastal fishers** • target mixed fishes • use a variety of gillnets, sometimes long lines • important to be self-reliant and not have liabilities • able to adopt to changing conditions • travel longer away from home, greater mobility • have additional jobs and rely on another household income	**Offshore trawlers** • work on big vessels, with rotating crew • are extremely mobile • make big investments, are likely to have debts • come from a long line of fishers and want to keep the business running in the family • focus on the entrepreneurial side of the fishing business	
Sønvisen (2014) *Typology of contemporary fisher images, focussing recruitment*	**Traditionalists** • crucial to local community strengthening • have social commitments • see fishing as a lifestyle • ambivalent towards new technology • vessel owners with a long family tradition in fishing • income is not an important factor in choosing this profession	**Modernists** • orientation towards more industrial fishing • prefer that catches be landed and sold locally • express a positive attitude towards new technology • as employees, income of fisheries played a main role in choosing the profession	**Neutralists** • neutral about the use and concern of new technology as well as management • employees with the lowest opinion of fishing in general	**Pragmatists** • entered the profession out of personal motivation and interest • more positively inclined towards technology • self-employed with greater economic ambitions

One of the earliest studies on fishers' behavior was about resilience. Although this term wasn't used back then, Smith and McKelvey (1986) identified two different types of fishers along their capabilities to deal with market and nature variability: (i) Specialists and (ii) Generalists. As their name suggests, Specialists concentrate on one specific fishing ground and fishing method, which might give them the opportunity to make a good revenue with a high-prized species, but leaves them inflexible if changes occur. Generalists on the other hand can easily switch between gears, target species and even other activities besides fishing (p. 88).

Creative Research (2009) gave an overview of different types of English fishers and their attitudes, motivations, and perceptions to inform management to especially improve communication with the Department for Environment Food and Rural Affairs, the rule-giving institution for the English fishery. With an open coding procedure, they developed three different types of fishers along the main category of "approaching and dealing with the uncertain future" (Creative Research, 2009, p. 113): (i) Leaders, (ii) Lieutenants, (iii) Followers. (i) Leaders take strategic and business-oriented actions, looking proactively for solutions for problems, they were facing. They are amongst the higher earners of the fishers, are more likely to be computer literate, and are vessel owners as opposed to hired crew. They keep themselves up to date and are seen as a natural leader in their community (Creative Research, 2009, p. 114). (ii) Lieutenants on the other hand are also most likely vessel owners and have a similar degree of experience, but are less business oriented than leaders. They focus on keeping themselves informed with information directly of concern to them but not with broader developments and tend to react to latest events, but not proactively anticipating them. Their inward focus makes them able Lieutenants to the Leaders. Besides that, they have been identified as the biggest group, making them important to target with any kind of measurement (Creative Research, 2009, p. 116). As opposed to Leaders, (iii) Followers are mostly fishers who are hired crew or who have been conducting their fishing practice with hardly any change over their fishing career (Creative Research, 2009, p. 116).

Other authors focused on different fishing tactics and fishers' strategies. Christensen and Raakjær (2006) looked at the strategic decision-making process of Danish fishers in demersal fishery in terms of investments and fishing tactics, describing three types of fishers: (i) Type A: keeping costs at a low level, (ii) Type B: using one preferred fishing method, and (iii) Type C: pushing the edge (p. 263). Fishers of Type A are very conscious about their expenses and their

opportunistic costs. They want to avoid going bankrupt and only invest little into their equipment and vessels. Furthermore, they value their time spend with their family, which is one reason why they don't go for day-long fishing trips, but stay relatively close to the harbor. These fishers are analyzed as very flexible, with multiple target species and changing gear. Despite this flexibility, they are more constrained by their coastal fishing practice in smaller vessels in terms of weather conditions and restrictive regulations (p. 263). As opposed to these close-to-home fishers, Type B fishers are nomads and are away from home for longer periods, in order to be able to apply their chosen and preferred gear, and have therefore a higher geographic mobility. They keep informed about latest technology and have a network of peers to keep aware of fishing opportunities. In order to arrange bigger investments, they must be convinced of the efficiency, because they are not big risk takers (Christensen & Raakjær, 2006, p. 264). Type C are the risk takers among the fleet, who spend very long times at sea and follow the clear objective to create a great revenue and increase profitability. They own large vessels arrange big investments dynamically. A very high geographic mobility and changing gears makes them highly efficient. They are skilled and innovative and easily take up on new inventions to improve their fishing practice (Christensen & Raakjær, 2006, p. 264).

Abernethy (2010) researched fisher's decision-making and argues that fishers base their fishing strategies, location choice in particular, on varying objective functions, depending on the type of fisher, such as income maximizing or balancing work and family life (p. 45). The results of the study aimed at providing insights for policy makers when designing regulations and gave information on how to create incentives to influence fishers' strategic behavior for desired management outcomes (Abernethy, 2010, p. 80). She developed strategic archetypes of fishers drawing on management theory in order to understand why some fishers are successful and some aren't and showed that understanding fisher incentives can help to achieve social-ecological sustainability and healthy fishing communities. She identified (i) Prospectors, (ii) Defenders, (iii) Analyzers, and (iv) Reactors (Abernethy, 2010, p. 79). (i) Prospectors come from fishing families, prefer fishing forms that they themselves do not find boring, but that involve an enhanced feeling of hunting. They are also very flexible in terms of their target species, fishing gear and fishing grounds, are often on long and nomadic fishing trips, and network with their peers to increase their revenue as much as possible. Of all fisher types, Prospectors are most adaptable to changing circumstances because of their flexibility. These vessel owners also know the industry trends and try to anticipate future developments

to improve their capacity for adaptability (Abernethy, 2010, p. 102). (ii) Defender-type fishers are not flexible in their target species or their gear. They are not interested in implementing or investing in innovation and are not easily able to adapt to changing conditions and therefore sometimes struggle to keep their businesses alive (Abernethy, 2010, p. 105). (iii) Analyzers are in the middle between Defenders and Prospectors, which means they are risk averse, but not as much as defenders, and they are also flexible in their fishing strategy, but not as much as prospectors. Before they make investments, they wait for the efficiency of, for instance, new gears to be proven (Abernethy, 2010, p. 107). They have a greater ability to adapt to changing conditions, but are not as flexible as Prospectors, due to their limited fishing strategies (Abernethy, 2010, p. 107). (iv) Reactors made up a small group of the sample of non-vessel-owners, describing fishers who became fishers because their family and their peer group had been fishing as well (Abernethy, 2010, p. 110). They don't change fishing gears or fishing grounds over the years. Because they are habitualized fishers, they are unlikely to adapt to changing conditions. If they had another opportunity for generating income, they would give up fishing completely (Abernethy, 2010, p. 110).

Another study that considered different types of fishers has come forward with the concept of fishing styles, grounded in social science theory, applying quantitative and qualitative methods (Boonstra and Hentati-Sundberg, 2016). They identified three different types of fishing styles: (i) Archipelago fishing style, (ii) Coastal fishing style, and (iii) Offshore trawling. (i) Archipelago fishers are risk averse towards investments; they have no debts, but also little costs. They have side jobs and rely on another household income to make a living (Boonstra and Hentati-Sundberg, 2016, p. 94). (ii) Coastal fishers target mixed fishes and use a variety of gillnets, sometimes complemented with long lines. Much like Archipelago fishers they emphasize that it is important to them to be self-reliant and not have liabilities (Boonstra and Hentati-Sundberg, 2016, p. 95). During changing conditions, they were able to adapt, and during the cod crisis they had different side jobs or relied on their partners' income, much like Archipelago fishers. In fact, Boonstra and Hentati-Sundberg (2016) state that the biggest difference between Archipelago and Coastal fishers are their fishing grounds and target species, but not so much their mentality (p. 95). Coastal fishers travel longer away from home and have a higher mobility to catch their target species. Whereas (iii) Offshore trawlers work on big vessels, with rotating crew and are extremely mobile (Boonstra & Hentati-Sundberg, 2016, p. 98). Due to their large vessels and big investments, they are likely to have debts and

have to fish a lot to make ends meet. They have also strong family ties in the fishing business, which means they come from a long line of fishers and want to keep the business running in the family. They focus on the entrepreneurial side of the fishing business through recurring investments and acknowledge that it is not only about catching the fish anymore. They also work with loans on a constant basis, claiming that this is part of this kind of fishery (Boonstra & Hentati-Sundberg, 2016, p. 99).

Sønvisen (2014) developed contemporary fisher images based on quantitative analyses and concluded how they have to be considered in fisheries management, especially recruitment policy. She identified four key images. Two of them are the basis of modern fisheries management: (i) Traditionalists and (ii) Modernists. The other two deviate from images that are usually prevalent in fisheries management: (iii) Neutralists and (iv) Pragmatists (p. 199). (i) Traditionalists are crucial to local community strengthening—they agree with different measurements that support local and costal fishery as well as their communities, such as local landing and selling of the catch. They have social commitments and see fishing as a lifestyle. They have an ambivalent attitude towards new technology—on the one hand, they appreciate it, because it might make work easier, yet on the other hand, they are afraid that new technology might threaten the resource and not improve the quality of the catch. As vessel owners, they have a long family tradition in fishing and might feel that it's their duty to become fishers, which might explain why income was not an important factor in choosing this profession. Nevertheless, they want to run a successful business, which also means to recruit new generations of fishers. They also have a relatively low level of education and a high passion for fishing, being the only ones who would recommend it to others (Sønvisen, 2014, p. 200). (ii) Modernists have greater orientation towards more industrial fishing in comparison to traditionalists, although they also prefer that catches be landed and sold locally. They have an intermediate degree of education, express a positive attitude towards new technology, and are open to market mechanisms (Sønvisen, 2014, p. 200). As employees, potential income of fisheries played a main role in choosing the profession. (iii) Neutralists on the other hand are neutral about the use and concern of new technology. They are employees and have the highest level of education and the lowest opinion of fishing in general. They were named due to their seeming neutral attitude towards management and technology (Sønvisen, 2014, p. 201). (iv) Pragmatists entered the profession out of personal motivation and interest, much like Traditionalists. Pragmatists are in the end neutral in their opinion of positive and negative

aspects of new technology, but weigh positive and negative aspects, which makes them more positively inclined towards technology than Traditionalists. Although they are also self-employed and share some other motivations with Traditionalists, they differ in their greater economic ambitions (Sønvisen, 2014, p. 201).

The presented research shows that there are already some studies dedicated to typologies of fishers. Although they each have different questions and describe their types using different categories, there are also commonalities and overlaps, which can be roughly summarized into two categories of fishers: rather forward-thinking fishers and rather conservative fishers.

Forward-thinking fishers include Prospectors (Abernethy, 2010), who in some respects are similar to Type B (Christensen and Raakjær, 2006) with their nomadic fishing trips (also a commonality with Coastal fishers in the Boonstra and Hentati-Sundberg (2016) study), peer-networking, and focus on revenue. Furthermore, Leaders (Creative Research, 2009), as well as Pragmatists (Sønvisen, 2014) are also part of this group with an anticipatory attitude and demand to keep abreast of industry developments.

In more conservative roles, there are fishers of the Defender-type (Abernethy, 2010) which resemble Type A (Christensen and Raakjær, 2006), for example in their aversion to innovation. Defenders (Abernethy, 2010) like to stick to their well-known fishing grounds and routines and have this characteristic in common with Followers (Creative Research, 2009). On the same line of argumentation Sønvisen (2014, p. 200) states that fishers of the Traditionalists type resemble Followers (Creative Research, 2009). Complementing this, Boonstra and Hentati-Sundberg (2016) establish rather conservative attitudes and risk aversion among Archipelago fishers.

2.2 Bycatch mitigation in fisheries literature

2.2.1 Human dimension aspects concerning bycatch mitigation

Although these are not sociologically mature studies, some researchers have collected anecdotal stories on bycatch in a way that can be seen as a precursor to sociological studies. In the case of dolphin-fishery interaction in the Mediterranean Sea, fishers have revealed in informal interviews their perspective on technical factors favoring bycatch, such as fishing gear, mesh size, and target species (Pardalou & Tsikliras, 2018, p. 1).

Although studies suggest that it is important to consider the social, political, and economic context for bycatch mitigation, only a few studies do so. One finding in the context of bycatch of dolphins suggests that in the light of institutional tensions regarding decision-making authority, effective problem solving of bycatch was hindered and therefore different expertise could not be integrated (Jenkins, 2007, p. 698). Another study considers different case studies of bycatch mitigation and fishers' behavior and then draws on change management literature for a meta analyses (Hall et al., 2007). They developed a change model, which focuses on leadership actions and different drivers for change adjusted to the change readiness of fishers (Hall et al., p. 282). Other topics in connection with bycatch mitigation included the unintended consequences of applying turtle excluder devices in the shrimp fishery for fishers' livelihoods as well as resource management in general (Moberg & Dyer, 1994) and the profiling of stakeholders involved in bycatch mitigation (Margavio et al., 1993).

Governance research has underlined which governance elements could be supportive for bycatch mitigation, such as the role of bridging organizations, involvement of local communities, and support from external institutions (Whitty, 2015, p. 131).

While they are numerous research ideas about how to mitigate bycatch, most bycatch studies—especially in the technology developing field—tend to work with assumptions about fishers when designing research. Widespread assumptions are: "(1) economic incentives will generate acceptance of bycatch reduction technology; (2) enforcement will generate compliance with bycatch reduction technology; and (3) 'participation' by fishers will increase both acceptance and compliance, and overall support for bycatch reduction technology" (Campbell & Cornwell, 2008, p. 327).

2.2.2 Technical and tactical bycatch mitigation measures

Whereas the social aspects of bycatch mitigation are understudied, bycatch mitigation has a long tradition in other fields. Gear modification, for example, is a popular solution towards mitigation of bycatch, because it avoids politically and economically costly decision (Campbell & Cornwell, 2008, p. 326). Technical solutions and tactical measures can be found in manifold studies (e.g. Almeida et al., 2017; Campbell & Cornwell, 2008; Hamilton & Baker, 2019; Leaper & Calderon, 2018). For gillnet fishing, technical suggestions include increasing acoustic visibility of gillnets (Kratzer et al., 2020; Trippel et al., 2008), attaching visual cues (Bielli et al.,

2020; R. Field et al., 2019; Mangel et al., 2018) or acoustic deterrence devices (Chladek et al., 2020; Dawson et al., 2013) as well as the use of thinner twines in nets or ropes to facilitate escape (Northridge et al., 2003). Tactical measures focus inter alia on spatial and temporal closures (Gormley et al., 2012; Murray et al., 2000; Regular et al., 2013), change of operational factors, such as water depth, mesh size, and net height (Northridge et al., 2017; Barz et al., 2020, p. 1) or setting up quotas for bycatch levels (Diamond, 2004). However, these technical and tactical measures alone often did not achieve their objectives, as seen in low uptake of newly developed mitigating fishing gear (Eayrs & Pol, 2019) or are hard to accept for the public or environmentalists, as seen in the case of quota for bycatch species (Campbell & Cornwell, 2008, p. 326). To overcome such a mismatch, incorporating the human dimension can positively affect management (Fulton et al., 2011, p. 2; Leenhardt et al., 2015, p. 49; Barz et al., 2020, p. 1)

2.3 Conclusion - closing the research gap

This chapter provided an overview of research conducted related to this thesis.

As far as known, there is no detailed knowledge about the life of the gillnetters and their bycatch practice in the German Baltic Sea beyond anecdotal stories. Aspects such as family structures, future generations, degree of organization, everyday life at sea, gender issues, marketing strategies, or political and participatory engagement have not been researched systematically. Although there has been an increase in social science research on fisheries management in recent years, fisheries management still works on assumptions of fishers' behavior or the lack of it (Campbell & Cornwell, 2008, p. 327).

Seldom do the reviewed studies mentioned above choose a qualitative reconstructive approach, which allows for a deep insight into fishers' actions. *They have also not looked for heterogeneity of fishing practices among fishers who primarily apply the same gear type, namely gillnets.* (Barz et al., 2020, p. 2). Therefore, it can be concluded that fishing as a social practice and as sociologically relevant has been an understudied topic in Germany. Furthermore, the same is observed concerning bycatch practices and sociological research on management instruments to mitigate bycatch. *Although it has been proposed to address different forms of fishers' actions for effective bycatch-reduction policies (Teh et al., 2015, p. 449), to the best of knowledge, no literature considering different types of fishers to mitigate*

bycatch of seabirds and sea mammals exists. Considering the different cultural and historical backgrounds as well as different site-specific situations, between the reviewed studies and the German gillnet fishers in general, the results from previous studies cannot simply be transferred (Salas & Gaertner, 2004, p. 12), especially as the specific objective of bycatch mitigation is not covered in these studies. (Barz et al., 2020, p. 2).

"A society is the most powerful combination
of physical and moral forces of which
nature offers us an example"

(Durkheim, 1976, p. 446)

3 Theoretical research perspectives and positioning

This work sees itself in the tradition of natural resource sociology as a policy-consulting research paradigm to which this thesis wants to contribute. In order to understand the traditions and meaning of natural resource sociology, this chapter gives an overview on its origins, current challenges, and topicality. Furthermore, terms and concepts that make it possible to access the management aspect of fishers and bycatch are introduced. This includes looking at fishers' actions from a sociological perspective, which on the one hand allows to approach the individual agency of fishers, and on the other hand to consider their embeddedness in political structures. It is therefore argued that from a sociological perspective, practice theory is predestined for applied research questions in the field of nature-human relationships. In this particular study, Giddens' structuration theory will provide the framework to answer the posed research question (Giddens, 1984). Structuration theory, with its main idea of a duality of structure, directs the view of the analysis to how actions of actors on the one hand influence structures, and how these structures also have an influence on the actions of actors. This interplay then manifests itself in the social practices that are examined in this study. For this purpose, the main features of structuration theory are elaborated upon, so that mainly concepts are presented that are beneficial to deepen the research subject. However, at times structuration theory needs to be complemented by other authors who elaborated on concepts that Giddens falls short on. To emphasize the agency of the actors and also to gain access to possible transformative moments, this chapter delves into the concept of agency as developed by Emirbayer and Mische (1998). Giddens' shortcomings in the consideration of the natural environment are also complemented by a brief conception of Latour (2001), who grants more space than Giddens to the influence of non-human entities on social practices. At the end of this chapter, the way to answer the research question about management instruments to mitigate bycatch is paved. Here, insights into the basics of environmental policy and current theoretically possible generic instruments of environmental policy are provided in more detail. These can then be seen as a model for

the discussion of bycatch-mitigating measures. Furthermore, the ecosystem-based approach to natural resource management is established as the leading paradigm behind holistic management approaches that include social-science perspectives and, therefore, the knowledge about social practices next to ecosystem conditions.

3.1 Natural resource sociology

Classics of sociology, such as Émile Durkheim, have already attributed importance to nature (Lange, 2011, p. 21). In his earlier works, Durkheim included nature as something transformable by humans in his understanding of society (Gross, 2000, p. 280). Gross (2000) argues that Durkheim is probably the most underestimated of the classics when it comes to the relevance of nature in his work (p. 280). Durkheim explains the differences in societies, among others, with natural population growth and resulting problems like limited natural resources (Durkheim, 1933). Thus, he uses environmental explanations rather than sociological explanations (Gross, 2000, p. 280). Durkheim (1982) considered social phenomenon as "of the same nature as physiological phenomena" (p. 136) and called for interdisciplinary work between social sciences and natural sciences (p. 56). He rejected a dualistic view of nature and society, but emphasized that society is hierarchically higher than nature (Gross, 2000, p. 281). Although there is still a long way to go to the modern sociology of natural resources, Durkheim demonstrated that studying the relationship between societies and the nature in which societies live in is not new and unique to modern natural resource sociology.

Natural resource sociology has its origin in rural sociology, which concerned itself with relationships between social organizations, wellbeing, and resource condition under the objective to understand rural life (D. R. Field et al., 2002, p. 214). Early studies were carried out by Benton (1918), who investigated good farming practices, focusing inter alia on landlords, tenants, and farm communities. Schickele et al. (1935) made a connection between soil erosion and disappearing communities with schools and churches. Buie (1944) illustrated how the misuse of land and soil erosion can affect the rural church through a clustering of churches according to the soil conditions around them and who connected these conditions to membership, church attendance, and contributions to churches and pastors' salaries. The establishment of natural resource sociology has a focus in the United States, where in the

1960s a growing pool of social scientists were hired by natural resource management agencies (Buttel, 2002, p. 206). At the same time sociologists established research on outdoor recreation as well as on resource-oriented rural communities and on rural-resource issues (Buttel, 2002, p. 206). The focus of these researchers has been practical and policy-directed as they explored the potential for effective and responsive resource management (Buttel, 2002, p. 206). However, sociology dealing with environmental issues was not able to establish itself in Germany until the 1990s. On the one hand, this was attributed to sociological blindness towards ecology. On the other hand, the recognition of nature as relevant for social development, which classics of sociology had already discussed, seemed to have fallen into oblivion until it re-emerged in the Chicago School in the 1920s and also in Germany, beginning in the 1970s (Lange, 2011, p. 20). However, in Germany the demand for application-oriented research in the field of the environment is becoming stronger as well. Nevertheless, even in recent times, there have been authors who argue that in sociology, animals and the relationship of humans to animals, even as a resource, have been largely sidelined by a self-understanding of sociology as a human science that assigns animals a place in "nature" (Buschka et al., 2012, p. 20). However, the emergence of strong research fields such as animal studies, science and technology studies, or sustainability studies in sociology present a different picture.

Sociology of fisheries is one of the more comprehensive developed areas within sociology of natural resources, including works on biophysical elements, the economic side, the role of science, the governance perspective, environmental movements, and globalization (Buttel, 2002, p. 210). In chapter two, the results of a literature review were introduced, presenting a broad picture of social-science contributions to fisheries management. Although a holistic paradigm in fisheries management has required post-normal, policy advising science (Goethel et al., 2019, p. 1896), the theorizing and implementing of empirical results from qualitative sociological studies into management is still at the beginning in sociology of fisheries. However, there are research perspectives and methods that are very well suited for answering questions within the sociology of natural resources, like praxeological perspectives.

3.2 A praxeological approach: conceptual foundation of structuration theory

The research conducted in this thesis was guided by a praxeological approach and therefore focused on social practices, because they are well applicable to discuss environmental problems and the question of change in terms of sustainable practices (Brand, 2011, p. 175). Praxeological approaches enable the dissolution of (seeming) contradictions such as micro- and macro- perspectives as well as the integration of structure theory and action theory, thus moving away from separating these research units. The perspective also enables to contemplate ecological problems and to include and reintegrate materialities into theoretical sociology, which were excluded in the first half of the 20th century and therefore had difficulties finding their way back into sociological perspectives (Brand, 2011, p. 174). The consideration of practice theories to include different materialities is utilized in this thesis to examine social fishing practices that are not independent from material constraints of natural resources and the environment.

Social practices are the doing, speaking, feeling, and thinking that actors necessarily share with each other, which is a prerequisite for understanding and acting in the world (Schäfer, 2016, p. 12). One of the guiding ideas of practice theory is the constitutive importance of implicit, practical knowledge in the form of preconscious attributions of meaning as well as know-how knowledge and cultural routinizations of motives for action, as embedded in social practices (Reckwitz, 2007, p. 332). Practices exist before actors engage in action and enable that action as much as they structure and constrain it. Social practices operate independently of individual subjects and yet depend on them to be carried out (Schäfer, 2016, p. 12). Praxeological theories therefore focus on carried out actions (*Tätigkeiten im Vollzug*), which constitute the order and change of social events and where routines seem to be the primary modus of action in praxeological mainstream theories (Bongaerts, 2007, p. 253).

Since the performance of praxeological approaches is particularly emphasized in their empirical application in the field of policy advice (Schmidt, 2016, p. 245), they thus afford an appropriate approach to this study's question of policy recommendations, based on insights generated through the sociology of practice perspective. In praxis theories, the recognition of contextualities and relationality of practices play a characteristic role (Schäfer, 2016, p. 13).

It is therefore possible to consider the very specific context of the German gillnet fishers as part of their social practice.

As a representative of the praxeological approach, Giddens (1984) primarily focuses on the development of routines and their spatial-temporal binding in structuration theory. Structuration theory emphasizes the opportunities for actions that are opened up by institutional structures (rules and resources) and their changes. Thus, it is especially suited for examining the social fishing practices of gillnet fishers, whose general social fishing practices are studied as well as their bycatch practice in particular.

This chapter explores the potential of what Giddens' structuration theory offers in order to sociologically consider and theorize social fishing practices and bycatch practices. To this end, the basic concepts of the theory are first described and its central assumptions, concepts, and models are elaborated upon.

With his theory of structuration, Giddens has presented a comprehensive social theory whose interest is in an interdisciplinary social science and the connection of theoretical and substantive issues (Joas, 1997, p. 11). Giddens, who sees himself as a leftist who appreciates Marx, can be interpreted as someone who did not focus on supra-temporal theories, but on what was already termed "post-normal science". Giddens developed a theory that ignores neither the reflective capacity nor the agency of individual subjects. Neither does it think of structures according to the model of macro-subjects. Furthermore, he engaged with Heidegger's philosophy of consciousness, which leads him to place temporality and spatiality of human existences and all social phenomena at the center of his approach (Joas, 1997, p. 12). Joas (1997) presents this as a point of theory that overstrained the understanding of some sociologists (p. 13), but Giddens claims that, if the social sciences do not relate to philosophy, they are lost (Giddens, 1984, p. xvii).

Structuration theory is applied successfully in numerous areas of research, such as accounting (Englund et al., 2011), archaeology (Barrett, 1988), strategic management research (Pozzebon, 2004), studies on electronic government (Puron-Cid, 2013), healthcare (Beringer et al., 2006), or knowledge management (Timbrell et al., 2005). It has also been applied to reconstitute specialties, such as sociology of technology (Orlikowski, 1992), or reconstitute an interdisciplinary field, such as migration studies (Goss & Lindquist, 1995). The conceptual inventory has been taken up and further developed by various social sciences (Walgenbach,

2013). Meanwhile, structuration theory hardly seems to be applied for research in the theory and empiricism of sociology of natural resources.[11] However, fishery is a social interaction between humans and natural resources that is influenced by actors (e.g., through their personal agency) and structures (e.g., fisheries policy and fish resources) alike. Therefore, structuration theory is a practical way to analyze complex human–natural resource interactions.

3.2.1 Duality of structure and recursivity

One of Giddens' central ideas is the duality of structure, in other words, a dual character of structures as enabling and restricting action, as a medium and as a result of practice (Giddens, 1984, p. 25), moving away from a dualism of structure and action (Fig. 3).

> "Structure thus refers, in social analysis, to the structuring properties allowing the 'binding' of time-space in social systems, the properties which make it possible for discernibly similar social practices to exist across varying spans of time and space and which lend them 'systemic' form" (Giddens, 1984, p. 17).

Structures and action presuppose each other. The structures form the medium and the result of social action and do not exist independently of human action, but are only produced and reproduced through social practices (Giddens, 1984, p. 25).

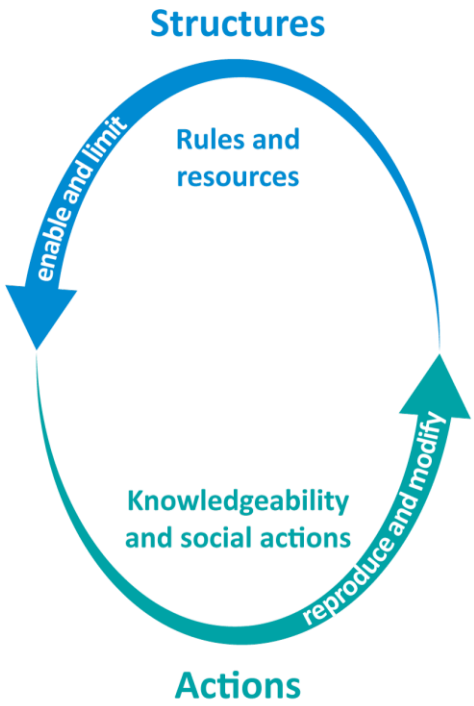
> "The constitution of agents and structures are not two independently given sets of phenomena, a dualism, but represent a duality. According to the notion of the duality of structure, the structural properties of social systems are both medium and outcome of the practices they recursively organize" (Giddens, 1984, p. 25).

The processes of structure formation move to the center of the theory and offer a way out of the dilemma of voluntarism and determinism (Joas, 1997, p. 14). Action and structure are not in competition with each other, but presuppose each other. In this way, structures are continuously reproduced in action. During patterns of interaction, social structures and institutions are replicated by conscious and knowledgeable actors on a daily basis (Giddens,

[11] Giddens himself offers considerations on the need for a fundamental change in social-natural relations in reference to climate change. Nonetheless, he does not conduct an empirical study, but rather discusses climate change and its mitigation from a political point of view (Giddens, 2009).

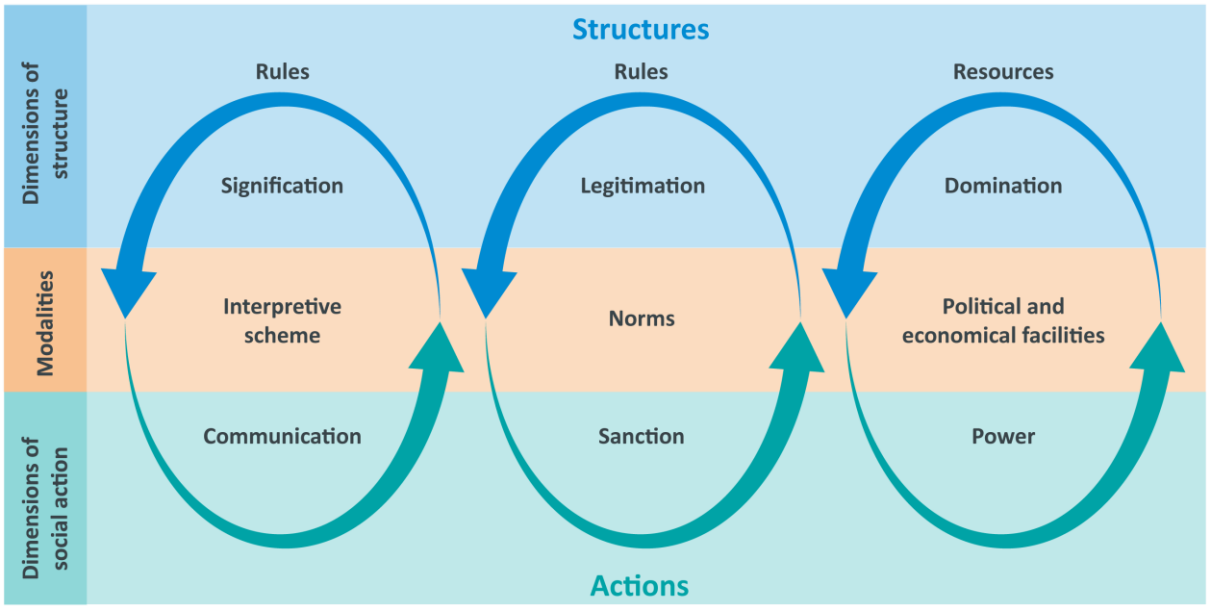
1984, p. 26). Human actions are thus recursive, which means that actors do not bring social practices into the world, but continually recreate them by referring to a common understanding (Giddens, 1984, p. 25). Common understanding is only possible when actors make common reference to shared practices. An example can be seen in language rules—actors apply certain grammatical rules when they speak and thus not only enable communication with other people, but also confirm the validity of the rules applied (Giddens, 1984, p. 24). Structures of social systems are on the one hand the medium and on the other hand the result of the practices that recursively organize them. Structures are realized in social practices and must not be compared with compulsion, since they restrict action, but they also enable actions (Giddens, 1984, p. 162). By regularly updating structures in action, they are reproduced in everyday life by actors. In a reproducing structure, actors reproduce the conditions that make corresponding actions possible but also produce unintended consequences, which may be unrecognized conditions for further actions (Giddens, 1984, p. 27) (see also Fig. 5).

Figure 3: 'Duality of structure': structure limits as well as enables actions. At the same time actions reproduce and modify structures



Duality is intended to fundamentally answer the question of how competent actors regularly engage in similar activities over a long period of time and under what conditions of action these are brought about (Schiller-Merkens, 2008, p. 159). The model of duality of structure refers to elements of the structuration process within which the order of social life can be developed and maintained (Giddens, 1979, p. 216). Structuration happens when agents refer to rules and resources during social practices (Fig. 3). It means processing of criteria and schemata, which are produced by actors in the context of the execution of actions and thus works with referential attributions of meanings (Reckwitz, 2007, p. 322). When criteria and schemata are recursively used in the execution of social practices, then a moment of uncertainty and of a potential new beginning is always built into this process. It means that during the process of structuration, the structures of rules are potentially modified and not only reproduced by pre-existing structures (Reckwitz, 2007, p. 321). The understanding of how structure and actions are related (Fig. 3) underlies the different dimensions of structure and action, consisting of rules and resources (Fig. 4).

Figure 4: Dimensions of the duality of structures (adapted from Giddens, 1984, p. 29)



At the level of structure, Giddens presents three characteristics of social structures: rules that constitute meaning (signification) and legitimize behavior (legitimation) as well as a certain distribution of resources (domination) (Giddens, 1984, p. 30).

> "One of the main propositions of structuration theory is that the rules and resources drawn upon in the production and reproduction of social action are at the same time the means of system reproduction (the duality of structure)" (Giddens, 1984, p. 19).

To explain the reproduction of systems, the features at the structure level are contrasted with three corresponding characteristics at the action level that are inherent to the production of interaction: the communication of meaning, the sanctioning of behavior, and the constitution of power which are tightly interwoven in social life (Giddens, 1993, p. 110). The connection between levels of structure and action is expressed in the concept of modalities, which are applied by the actors in their current actions. By relating actions to modalities, social practices emerge which actors draw upon and therefore reconstitute (Giddens, 1984, p. 28). In order for modalities to be relevant to action and to be realized, they must be known to the actors (Giddens, 1984, p. 29).

3.2.2 Rules of signification and legitimation

Rules are techniques or generalizable procedures used in the reproduction of social practices. Giddens emphasizes that rules are fundamentally open to different courses of action depending on their interpretation, and all rules are inherently transformational (Giddens, 1984, p. 17). Most rules that produce and reproduce social practices are tacitly understood by the actors, which means that they know how to proceed. "The discursive formulation of a rule is already an interpretation of it" (Giddens, 1984, p. 23), and this can lead to a change in its application. How important rules are in terms of structuring can be supported by Harold Garfinkel's breaching experiments in which, through the deviation from norms, these rules become clear, which are otherwise only implicitly present but must necessarily be observed for a functioning and trouble-free social interaction (Garfinkel, 1973). Rules are therefore intimately connected to routines, because rules that are in place and followed ensure the repetitive character of practices, which can be interrupted through critical situations.

Signification codes, as one aspect of rules, refer to the constitution of meaning. Signification shows in modes of discourse contain the actors' bodies of knowledge and are reflexively applied to maintain communication (Giddens, 1984, p. 31). The duality of structure patterns of interpretation is reproduced through realization in action (Giddens, 1984, p. 30). Actors apply patterns of interpretation or interpretative schemes in communications (Giddens, 1984,

p. 29). During communication, actors routinely draw upon aspects of contexts, such as the temporal order of conversations, which are indispensable for the production of meaning (Giddens, 1984, p. 71). The explicitness of expressions in everyday language that actors have to perform can only be comprehended if this contextual order is included (Giddens, 1984, p. 71). For the analysis of the main mechanisms of duality, the analysis of the phenomenon of language is crucial, since actors refer to interpretative schemes for the communication of meaning in their interactions (Giddens, 1984, p. 73).

Normative regulations are another aspect of rules (legitimation). They concern value concepts that define permissible actions and sanctioning, which manifest in legal institutions (Giddens, 1984, p. 31). Normative components of interaction are always based on relations between the rights and duties expected from the participants of the interaction. Although symmetry between rights and duties is usually expressed in formal codes of conduct laid down in laws, this does not tend to exist in practice (Giddens, 1984, p. 30). "Normative sanctions [as enshrined in formal law - FB] express structural asymmetries of domination" (Giddens, 1984, p. 30). The relationships of those who are subject to normative sanctions can take a variety of forms, which can be quite different from the obligations that these norms generate. Furthermore, social occasions are affected by sanctioning norms, when they are not located in a particular sector of time-space that is recognized as appropriate or are not performed correctly (Giddens, 1984, p. 71; 126). Among other factors, normative sanctions have a strongly constraining character for social practices (Giddens, 1984, p. 173). Besides laws, there are sanctions in form of informally applied sanctions, which must not be underestimated for the diversity of social practices (Giddens, 1984, p. 23).

3.2.3 Resources of domination

Resources constitute structures of domination and are divided into allocative resources and authoritative resources, which are focused via signification and legitimation (Giddens, 1984, p. 15). Authoritative resources can be described as capabilities and capacities that allow for domination over other actors. They constitute inter alia the organization of life chances. Allocative resources are represented in the disposal and transformative capacity of material aspects of social life and can be material features of the environment or produced goods

(Giddens, 1984, p. 258). They only become resources when they are incorporated into the process of structuration (Giddens, 1984, p. 34).

Resources can shift from time to time depending on the agent's placement inside the social structure. Giddens states that both forms of resources are infrastructural and one form should not be placed before the other in its significance (Giddens, 1984, p. 259). Material objects only become powerful resources when they are applied into interaction processes as such. For example, a piece of paper only becomes money and thus a means of power when it is used in social interaction processes. Resources are therefore socially constructed (Schallnus, 2006, p. 56).

Signification, domination, and legitimation are only analytically separable units of structure, and communication, power, and sanction are also integral components of concrete practice or current action, as exemplified by Giddens with domination:

> "Domination – as I conceive of it – is the very condition of existence of codes of signification" (Giddens, 1984, p. 31).

Through the practical justification of actions with reference to norms, legitimate orders are realized and also reproduced. The norms, in turn, are derived from the legitimate order. "Power […] is generated in and through the reproduction of structures of domination" (Giddens, 1984, p. 258). By referring to means of power (facilities) that are derived from structures of domination, for instance from authoritative and allocative resources, the actors in turn reproduce the structures of domination (Giddens, 1984, p. 258). In this way, structures of domination are a medium but also a result of the exercise of power within the framework of concrete social practices.

3.2.4 Routines and ontological security

Rules exist in collectively shared knowledge of actors and presuppose that actors are conscious and act reflexively.

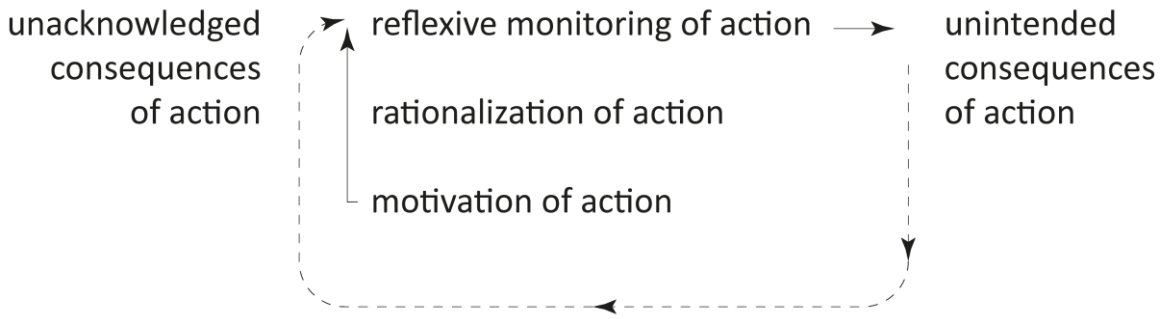
> "Most of the rules implicated in the production and reproduction of social practices are only tacitly grasped by actors: they know how to 'go on'. *The discursive formulation of a rule is already an interpretation of it*, and, as I have noted, may in and of itself alter the form of its application" (Giddens, 1984, p. 23) (highlight in the original)

Actors thus possess knowledgeability—their awareness as agents (Giddens, 1984, p. 281)—which is elaborated upon later on. Actors know about their actions, and their reasons for acting are largely present to them in the form of practical consciousness (Giddens, 1984, p. 22). Practical consciousness combines with the routinization of everyday actions. Routinized everyday actions are carried out day after day and provide a certainty of being (*Seinsgewissheit*) that allows tensions or sources of anxiety to be faded out. Routines are therefore the predominant form of everyday practice and can explain how social practices can bridge over space and time. Routines are taken-for-granted patterns of behavior that recur over time, which are based in the basic security system. Routinized practices regularly reproduce structures and thus express the duality of structure (Giddens, 1984, p. 282). They can be interrupted by critical situations, which "produce a sort of corrosive effect upon the customary behavior of the actor, associated with the impact of anxiety and fear" (Giddens, 1979, p. 126). In a critical situation, the actor has an increased susceptibility or vulnerability to the influences of others (Giddens, 1979, p. 126). If a disruption of the routine occurs, it loses its controlling momentum, and where routine controlled possible fear and guilt, now it is released (Loyal, 2003, p. 56). Routines include everything that is done habitually and are a basic element of everyday social action (Giddens, 1984, p. xxiv). The concept of routinization is rooted in practical consciousness. The importance of routines can be underlined by looking at critical situations. Critical situations are events characterized by a radical and unpredictable rupture that affects a rather larger number of individuals. They are situations that threaten the certainty of institutionalized routines (Giddens, 1984, p. 62). Routines bring with them the feeling of being able to act autonomously; they mean the reduction of anxiety or uncertainty and therefore they maintain an ontological security, within which primal tension can be managed (Giddens, 1984, p. 64). Routinization is the habitual, taken-for-granted character of the vast majority of practices in everyday social life. Routinized practices have unintended consequences (Fig. 5) and have a key role in explaining the order of social life (Mendoza, 2001, p. 272). Although actors reflectively monitor their actions—at this point Giddens refers back to a psychological understanding of actors—they still follow their routines because "they have a generalized orientation to the maintenance of routine or the continuity of social life" (Mendoza, 2001, p. 273) Their repeated practices sustain the ontological security system and as a consequence lead to social reproduction (Mendoza, 2001, p. 284).

3.2.5 Stratification model

Routines can maintain the stratification of the personality (Giddens, 1979, p. 96). Giddens describes actions through his stratification model (Fig. 5) as a construction of human agents, presenting three different layers of cognition and motivation. The knowledgeable and capable actor is at the basis of his model—in this manner Giddens distinguishes himself from the decentralization of the subject of structuralism (Joas, 1997, p. 12).

Figure 5: Model of stratification (Giddens, 1984, p. 5)



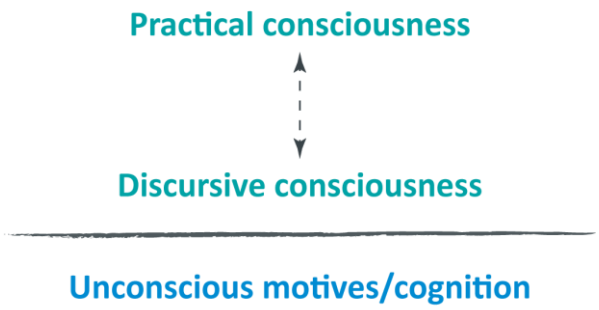
Reflexive monitoring by actors is an integral part of everyday action. It is directed at one's own behavior and also at that of other actors. Actors thus control their own actions and expect the same from other actors. However, they also monitor the social and physical aspects of the contexts in which they move (Giddens, 1984, p. 5). Through recourse to tacit and discursive knowledge, reflexive monitoring reproduces them. This creates a continuity of social reproduction, again emphasizing the routine, which holds down potential sources of anxiety and their potentially corrosive effects (Giddens, 1979, p. 126).

Rationalization of action means that actors routinely develop a theoretical understanding of the reasons for their actions. This does not mean that they can discursively elaborate on reasons for their behavior. However, competent actors expect from each other that they are usually able to articulate the reasons for their actions when asked. Generally, these questions only arise for lay people in the case of deviant behavior or behavior that they do not understand. Giddens differentiates reflexive steering and rationalization of actions from their motivation. He does not equate reasons and motivation, and most elements of social practices

are not directly motivated (Giddens, 1984, p. 6). While reasons refer to the causes of actions, motives refer to the needs that prompt action. Thus, motivation is not part of routine and does not refer to everyday actions. Rather, it refers to a potential for action, which in turn can also have a direct influence on actions in situations that deviate from the routine (Giddens, 1984, p. 6). Here, Giddens draws on Alfred Schütz's concept of *Entwürfe* to show that motives are rather fundamental to an overall plan within which different behaviors can be carried out. Unlike reasoning for actions, motives cannot necessarily be discursively stated by actors (Giddens, 1984, p. 6). Reflexive monitoring, rationalization, and motivation are embedded sets of processes (Giddens, 1984, p. 3). Unintended consequences are a by-product of regularized behavior, which is reflexively sustained by agents. Loops of unintended consequences foster social reproduction over long durations of time. Repetitive activities located in a particular temporal and spatial context have consequences in other space-time contexts, which are not intended by the performers of the activities. What happens in that other space-time context then influences, directly or indirectly, the subsequent conditions of action in the initial context. Explanatory variables are needed to explain why agents are motivated to participate in regulated social practices over time and space and what the consequences are (Giddens, 1984, p. 15).

The model of stratification is closely connected to conception of different forms of consciousness. Giddens differentiates the discursive consciousness, based on Habermas' application of the concept, practical consciousness, going back to Wittgenstein, and the unconscious, based on the Freudian tradition (Loyal, 2003, p. 61) (Fig. 6).

Figure 6: Different level of consciousness after Giddens (1984, p.7)



Although people act in routines during their everyday life, this doesn't mean that they are not able to verbalize their actions or reasons, because actors have a discursive consciousness and

can therefore discuss why they do what they do and are "able to put things into words" (Loyal, 2003, p. 46). The practical consciousness on the other hand refers to things that are simply done. In practical consciousness criteria and schemata of rules are anchored. These criteria and schemata thus establish the knowledgeability of the actors and their social wealth of knowledge (Reckwitz, 2007, p. 319). The practical consciousness is responsible for the ability of actors to act and is the place where reflexive monitoring takes place, but choices made by agents cannot necessarily be articulated until asked about (Ilmonen, 2001, p. 16). It is employed during in the enactment of actions as tacit or mutual knowledge and enables actors to continue their actions (Giddens, 1984, p. xxiv). Practical consciousness is also the most dominant consciousness, because it corresponds to routinized actions or materializes in them (Ilmonen, 2001, p. 16). The separation between discursive and practical consciousness is not rigid, but permeable, as represented by the dotted line above (Giddens, 1984, p. 5). The limitation that Giddens ascribes to human consciousness is expressed through a barrier between discursive and practical consciousness and unconscious motives based on mechanisms of repression (Giddens, 1984, p. 7). Unconscious motives refer to needs that prompt action but are not directly embedded in the continuity of action. They refer rather to a potential for action and provide for overall plans (Giddens, 1984, p. 7). Unconsciousness also produces unintended consequences of actions, which in turn represent unacknowledged conditions for further actions through feedback processes (Fig. 5) (Giddens, 1984, p. 8). Although Giddens acknowledges limitations in the consciousness of actors, consciously acting actors hold a key position in the theory of structuration. Through the direction of reflexive control towards the behavior of others and the context in which actors move, actors control their own everyday actions.

3.2.6 Knowledgeability and mutual knowledge

When acting, agents have knowledgeability and capability to know and adequately apply social practices (skillful procedures). Knowledgeable actors (agents) use purposeful behavior, which typically results in the reaffirmation of social practices. The core of knowledgeability is the knowledge of social rules, which are expressed above all in the practical consciousness, whereas knowledgeability itself is a main characteristic of human agents (Giddens, 1984, p. 21). Social actors are highly educated in terms of knowledge that they need for the production

and reproduction of everyday social encounters. However, most of this knowledge is of a practical rather than theoretical nature (Giddens, 1984, p. 22). Therefore, the fundamental importance of knowledgeability is based less on discursive consciousness and more on practical consciousness. In order to find their way in the diversity of social life contexts, actors have detailed knowledge about social conventions, themselves, and others (Giddens, 1984, p. 22). The bounded knowledgeability of actors is based on the limited perceptual and information processing capacities, or on the dependence of the conditions and consequences of action on too many uncertain factors that, even with a (theoretically possible) elimination of the limits of the perception and information processing capacities, cannot be known (Giddens, 1984, p. 282). Knowledgeability is recursively involved in the duality of structure. On the one hand, knowledgeability of agents is a condition for their actions and thus for the reproduction of the structure. On the other hand, the structure and stability of the social system over space and time is a condition for the formation of knowledgeability (Schallnus, 2006, p. 73). The stability and the regularity of social life make the reliable production of knowledge possible. Without the order of social practices, knowledge concerning the conditions of action and thus the rationalization of action could not emerge. At the same time, structures not only enable the acquisition of knowledge, but also restrict them (Schallnus, 2006, p. 73).

In order to reconstruct the social practice, it is necessary to reconstruct the rule knowledge of the participants and their mutual knowledge (Reckwitz, 2007, p. 9). Actors have basic knowledge that enables them to reflect on their own actions and the actions of others (reflexive monitoring of action). At the same time, they can consider the specifics of the respective spatial and temporal context (Giddens, 1984, p. 21). This action-relevant knowledge is mutual knowledge of the social actors about the structural conditions of their everyday social actions (Giddens, 1984, p. 375).

> ”I use the term ‘mutual knowledge’ to refer generically to taken-for-granted ‘knowledge’ which actors assume others possess, if they are ‘competent’ members of society, and which is drawn upon to sustain communication in interaction. […] Mutual knowledge is applied in the form of interpretive schemes whereby contexts of communication are created and sustained in interaction” (Giddens, 1993, p. 113). (highlight in original)

Mutual knowledge, however, does not mean that all actors have the same knowledge. Since modern actors are always involved in several social systems, they also have different experiences, and that makes knowledge that is relevant for action regarding society subject-specific (Schiller-Merkens, 2008, p. 151). Every person in a social system has the power to change what they do in that social system, even if the structure of the social system, respectively social groups, limits their behavior (Schiller-Merkens, 2008, p. 155). This power to intervene and arrange choices is described as capability. The ability of actors to use the resources at their disposal in processes of action constitutes said capability of these actors. Although capability is influenced by asymmetrically distributed resources, in principle, any resources allow each actor some control over the reproduction of social practices, which means that subordinate actors can also influence the activities of their superiors. Giddens (1984) describes this as "dialectic of control in social systems" (p. 16).

3.2.7 Constraints

As postulated before, in structuration theory structure enables as well as constraints agency. Giddens refers to Émile Durkheim's studies on constraints, suggesting three forms of constraints but also emphasizing their enabling side. Socialization is one form of constraint, which he illustrates with the example of learning a first language: no one chooses their first language. Any language will constrain thought and actions and therefore set limits in cognition. On the other hand, learning a language expands an individual's cognitive and practical abilities (Giddens, 1984, p. 170). Constraints can also be found in institutions, which are difficult to manipulate by individual actors due to their strong time-space expansion. In this way, some experiences are made impossible, but others are made possible (Giddens, 1984, pp. 170). The third constraint relates to the restriction of the scope of action of an agent. It is limited through social facts, which Durkheim constructs as objective and external. Although Giddens concedes that limited dispositions and coordination constraints hide certain options for action in interactions, he never tires of emphasizing that these constraints also have action-enabling aspects (Giddens, 1984, p. 172). After this introduction, related to Durkheim, which he does not see as contradictory to the structuration theory, Giddens further develops his three meanings of constraints: material constraint, sanctioned constraint, and structural constraint. Material constraints stem from the physical properties of the body and from its material milieu. The constraining and enabling moments based in these have to be

put in relation to each other. All people have to accept the limitations of the body and the limitation of its means of movement and communication (Giddens, 1984, p. 174). Sanctions, as restrictive aspects of power, can be found in various forms, from the use of force and its threat to mild forms such as disapproval (Giddens, 1984, p. 175). Sanctions are rarely totalitarian constraints; most often they presuppose some kind of consent. A sanction can therefore only take on meaning if the sanctioned party attaches significance to the sanction, which means that it is derived from a punitive response of some agents towards others. Giddens gives the example that even death threats are only constraints if the threatened person wants to stay alive (Giddens, 1984, p. 175)—an example for the dialectic of control (Giddens, 1984, p. 16). However, he also describes that sanctions of one actor can mean an opportunity for another, thus revealing the greatest possible asymmetry of the relationship between enabling and constraining (Giddens, 1984, p. 176). As a rule, sanctions are only really visible where an intended violation has occurred or where a violation is considered likely. Especially in routinized behavior, power relations are often so deeply embedded that they are taken for granted by the actors involved (Giddens, 1984, 176). Structural constraints on the other hand derive from the contextuality of action and cannot be changed by an individual actor because the scope of action of an actor in a given situation is restricted.

Giddens points out that constraints (as well as enabling aspects of actions) are historically changeable regarding the material and institutional frameworks of action or the forms of awareness that actors acquire about it (Giddens, 1984, p. 219).

3.2.8 Agency

Giddens emphasizes humans as being active agents who are rational and creative. Agency does not refer to the intentions people have when they act, but to their capability to act in the first place. In this sense, agency implies power and agents can produce effects. Agency refers to events in which an individual is the initiator, which means that the individual could have acted differently at any stage of a given action. "Whatever happened would not have happened if the agent had not intervened" (Giddens, 1984, p. 9). Agents are able to act differently, which means they can intervene in their world and environment or neglect to do so and therefore have influence on processes (Giddens, 1984, p. 9). They thus have the capability to make a difference and deploy some sort of power. It is constitutive to agency that

agents are seen as capable. This link between being seen as capable of action and acting is prompted in the reproduction of social practices, that is, agents are seen as capable of action through their practices and social reproduction of these practices (Giddens, 1984, p. 80). Agency refers to something that agents do, not what they intend, as described with the unintended consequences in the stratification model (Fig. 6). Giddens gives the example of an actor switching on the light and therefore alerting an intruder. While turning on the light and alerting the intruder were actions, alerting the intruder was not an intention. Regardless of the intention of the agent, the event of alerting would not have happened if the light was not switched on (Giddens, 1984, p. 10). The intentionality of consequences depends on the knowledgeability of the actors, as much as the power they are able to deploy. However, the area of control by agents is mostly limited to the immediate context of actions or interactions (Giddens, 1984, p. 11).

Other authors and theorists have also contributed to further developing the concept of agency.[12] Schatzki (2017) describes agency, inter alia, as choosing among different options and therefore having an effect on social affairs (p. 38). While Schatzki speaks of agency in general, Emirbayer and Mische (1998; 2017) dissect the concept of agency in more detail, which is presented now. A more detailed consideration of the concept of agency is necessary at this point, as it is through the interviews that the core of fishers' social practices, and thus the agency that guides them, is drawn out. The classification of agency that is discussed below can only be understood as an analytical separation. At the point where Giddens pays too little attention to his concept of agency, the authors start and develop different dimensions of agency that are in dynamic interplay with each other and thus also vary in different contexts of action (Emirbayer & Mische, 2017, p. 139). Just like Giddens, they also refer to enabling and constraining contexts of actions in which social practices and agency are embedded (Giddens, 1984, p. 140). The authors conceptualize agency as a temporally embedded process of social shaping that is informed by the past but also directed towards the present and future. Actors can orient themselves towards all these named temporalities at any point in time. Nevertheless, in a particular structural context at a particular point in time, one orientation is

[12] An interesting debate, that I will not elaborate on here, is the question how agency concepts, which are often limited to "developmentally normal" individuals, consider disabilities. Through the traditional focus on an intellectual capacity as a foundation for agency, it is rather exclusive and not a universal concept for all human individuals (Landes & Settersten, 2019)

predominant (Giddens, 1984, p. 140). The three elements of agency are: Iteration, projectivity, and practical evaluation. They are distinguished by their different temporal orientation to the past, future, and present. The authors speak of a "chordal triad" (Emirbayer & Mische, 1998, p. 972), which means that each element resonates in every action, but in different strength and independently. Thus, one dimension can become dominantly visible in actions.

Iteration refers to a selective reactivation of known schemes and patterns of thought and action. Actors have routinely internalized these in form of practical activity (or practical knowledge according to Giddens). This creates stability, which helps to maintain identities, interactions, and institutions over a longer period of time (Emirbayer & Mische, 2017, p. 148). Actors can recall, select, and apply self-evident schemes of action accordingly. They have developed and classified these in previous interactions. Although actors do not need to consciously reflect in order to apply these familiar schemes of action, attention is still required to narrow down the appropriate course of action that is required in the current context. The process of applying the iterational dimension involves first identifying typical patterns of experience that have occurred in the past. Then, the experiences are placed into social categories, such as social or normative categories. These sorted experiences can then be selected and applied as needed. Through this process, actors are able to form expectations about the future, which provide stability to their actions and confidence that others will act in an equally predictable manner (Emirbayer & Mische, 2017, p. 158). Most of their lives, actors apply these mostly unproblematic patterns of action to relieve themselves (Emirbayer & Mische, 2017, p. 153). In Giddens' theory of structuration, the iterational dimension can be found especially in his key concept of routinization, where the predictable actions of others also play a role (cf. chapter 3.2.4).

Projectivity involves the imaginative creation of a possible future course of action by actors. Furthermore, it also includes the ability to creatively reconfigure the thought structures and action patterns obtained, depending on which hopes, fears, and wishes apply to the future (Emirbayer & Mische, 2017, p. 149). Actors can thus respond to unforeseen challenges. They can distance themselves from habits, traditions, and familiar social identities as well as institutions. In this way, they can reinterpret traditions and introduce innovations, depending on their intentions. The design of projects is always an active and culturally embedded process in which actors negotiate their future, and it is driven by conflicts and challenges of social life. While iteration is characterized by schematization of actions, projectivity is anchored in

hypothesizing. Actors attempt to generate alternative responses and thus reconfigure problematic situations. In other words, they construct images of where they would like to be in the future and think about how to get there. In doing so, they rely on anticipation of future possibilities and construct future narratives and action plans. Meanwhile, different scenarios can be played out, which then lead to a hypothetical conclusion that relates to the conflict they are experiencing. Subsequently, a hypothetical conclusion may be practically put to the test and several designs can be probed this way (Emirbayer & Mische, 2017, p. 170). Projectivity is thereby directed toward problems that cannot be managed through habits (Emirbayer & Mische, 2017, p. 162). However, this problem-solving strategy does not have to be morally superior or desirable (Emirbayer & Mische, 2017, p. 165).

The practical-evaluative element of agency, on the other hand, refers to the actors' ability to make practical and normative judgments regarding alternative courses of action in the present. In doing so, they engage with expected demands, dilemmas, and ambiguities of a newly emerging situation (Emirbayer & Mische, 2017, p. 149). Certain routines must be subjected to new assessments and decisions under changing circumstances, just as projects and designs must be evaluated under current conditions. Thus, these evaluations are situationally adjusted judgments (Emirbayer & Mische, 2017, p. 176). Actors make thoughtful decisions that challenge traditional patterns of action. Actors strengthen their ability to exercise agency in a mediating way through their practical evaluations. They put themselves in a position to pursue their projects in ways that challenge and change the situational contexts of action themselves, even though this may involve unintended consequences (Emirbayer & Mische, 2017, p. 177). Analytically, the process of evaluation, like the other dimensions, consists of several components. It begins with interpreting a given situation as problematic. The problem is then characterized based on past schematizations. Actors must now deliberate whether the situation requires the retrieval of a known action schema or the pursuit of a new project. They then make a decision that is sometimes consciously perceived and sometimes not perceived in practical activities. These decisions relate to goals in sight and not so much to long-term projects. As a result, they tend to be opportunistic and provisional. These decisions are then put into action, in other words are effectively executed (Emirbayer & Mische, 2017, p. 180).

3.2.9 Transformation

Actions performed by agents logically involve transformative capacity (Giddens, 1984, p. 15).

> "The seed of change is there in every act which contributes towards the reproduction of any 'ordered' form of social life." (Giddens, 1993, p. 108) (highlight in original).

According to this understanding, every actor has the power to bring about transformations through every action. Although Giddens does not elaborate on concrete transformation potential, he does make considerations about power that can contribute to the description of transformation processes. Power can be found in every action. Whereby it is not a resource itself, but

> "Resources are media through which power is exercised, as a routine element of the instantiation of conduct in social reproduction." (Giddens, 1984, p. 16).

Strategically situated actors aim to reflexively regulate the conditions of system reproduction through processes of selective information filtering in order to maintain things as they are or to change them (Giddens, 1984, p. 27). The logic of structuration theory suggests that there is indeed potential for actors to change structural moments in changing the initial conditions of a renewed action, influenced by the unintended consequences of previous actions (Giddens, 1984, p. 5). To come back to the example of language rules in the previous part of this chapter, the theoretical potential for transformation can be extended by a German language example: The German grammar form of genitive is being replaced by the dative in everyday language use by most speakers (Elter, 2005, p. 125), which can be explained by the fact that the language rule has no longer been renewed in speech practice, but has been replaced at least in part by a new rule. Without human agency, there would be no human societies or social systems. However, this does not mean that agents create social systems, but they reproduce and change them by always creating anew what already exists in the continuity of practice. In this context, the consideration of space-time extension is important: the larger they are for social systems (as, for example, institutions have large space-time extensions), the more difficult it becomes for individual agents to act on or change them, because they are the most profoundly embedded structural properties (Giddens, 1984, p. 17).

Following the presentation of the notion of agency in the previous section, the transformation potential of human agency on structural environments can now be elaborated upon.

Independently of this, it remains valid that agency naturally also makes it possible to not only transform, but also sustain the structural environments further (Emirbayer & Mische, 2017, p. 140). Differentiating dimensions of agency helps to capture various and changeable capabilities that enable actors in different contexts to bring about transformation and intervention (Emirbayer & Mische, 2017, p. 147). Emirbayer and Mische (1998) articulate that actors are able to formulate projects for the future and to realize them in the present. Albeit in a limited way and with unpredictable consequences (p. 994), in the same manner as Giddens assumes unintended consequences in his stratification model (Fig. 6).

The role of agency in processes of change is significant (Calderón-Contreras & White, 2020, p. 209), because people can imagine things and act to transform their environments and therefore bring those conditions about (Norris et al., 2008, p. 141). By differentiating the several dimensions of agency, both reproducing and transforming dimensions of social action can be located. It can also explain how reflexivity can effect change through either routinization or problematization of experience (Emirbayer & Mische, 2017, p. 151). As described earlier, transformational potentials lie in the practical evaluative and projective dimensions of agency that can lead to change in a context of action, even if that context itself limits the application of agency. In the practical evaluative dimension, actors can use cunning practices to subvert established orders and thus "turn the rules of an imposed world upside down" (Emirbayer & Mische, 2017, p. 184). Furthermore, moments of transformation are possible when there are no clear expectations of actions and/or associated roles (Emirbayer & Mische, 2017, p. 185). Collective projective imaginaries, on the other hand, can be a crucial role in movements and revolutions and thus change structures (Emirbayer & Mische, 2017, p. 173). Furthermore, projective imaginations are an important factor in institutional reform efforts and can suggest courses of action to improve problems (Emirbayer & Mische, 2017, p. 174). According to Emirbayer and Mische (2017), actors can increase and decrease their potential for innovation, choice, and transformative impact in relation to situational contexts within which they act by changing or shifting their agentive orientations of their triad (Emirbayer & Mische, 2017, p. 187). However, at this point they do not provide an explanation of exactly how this can occur.

As Giddens shows, sophisticated macro-theories can be developed from a practice-theoretical perspective. As soon as the approach becomes empirical, however, it is limited to ethnographic studies of manageable fields of practice. Here praxeological approaches unfold

their greatest strength above all in the inclusion of material arrangements in social practices (Brand, 2011, p. 194). Gillnet fishery in the German Baltic Sea is such a small ethnographic field, which is constituted, among others, through materialities such as fishing stocks. However, because Giddens does not strengthen the meaning of materialities in his theory, at this point the theoretical view is expanded with a more solution-oriented approach from the advancement of praxeological theories.

3.2.10 Expanding structuration: the meaning of materialities

The sociology of practice is about identifying and relating the multiple aspects of practice as material entities, which dissolves the separation of spheres such as nature and culture (Hillebrandt, 2016, p. 83). However, this comes up short in Giddens' work—he includes the materiality of social life in his theoretical approach only under the aspect of the embodiment of social practices (Brand, 2011, p. 183). The representatives of the second wave of practice theory, however, expand the concept of social practices regarding the material practice dimensions (Brand, 2011, p. 178). They theoretically link the formation of social practices with the search for solutions to practical problems and include the material conditions as constitutive into the formation process, the stabilization as well as the restructuring of social practices (Brand, 2011, p. 189). One of these representatives is Bruno Latour, who developed the comprehensive actor-network theory (Latour & Roßler, 2007). The main idea of this theory is presented briefly below, as it delivers useful insights to compensate structuration theory shortcomings in excluding spheres such as nature.

Latour uses the concept of actants to distinguish it from actors, thus creating new conceptualizations that include non-human actors. He postulates that human and non-human actants cannot produce practices in isolation from each other. Therefore, he places the connectivity of these actants and their practical efficacy at the center of his theory (Hillebrandt, 2016, p. 84). Latour understands both human and non-human actants as equal and active components for the constitution of practice (Latour, 2001, p. 109). Furthermore, material things and technical artifacts generate and reproduce social practices through their interaction with human actants (Hillebrandt, 2016, p. 87).

In order to expand structuration theory, seeing parts of the natural and material environment as having a significant influence on social practice is an appropriate approach for research on

social fishing practices in particular. It is therefore argued that structuration theory is compatible with questions of natural resources, but the role of natural actants must also be emphasized. The resulting knowledge about and understanding of the interplay between structure and action can be the basis for policy measures in natural resource management. Environmental policy and generic environmental management instruments are subsequently discussed in the following chapter while taking these considerations into account.

3.3 Environmental management instruments

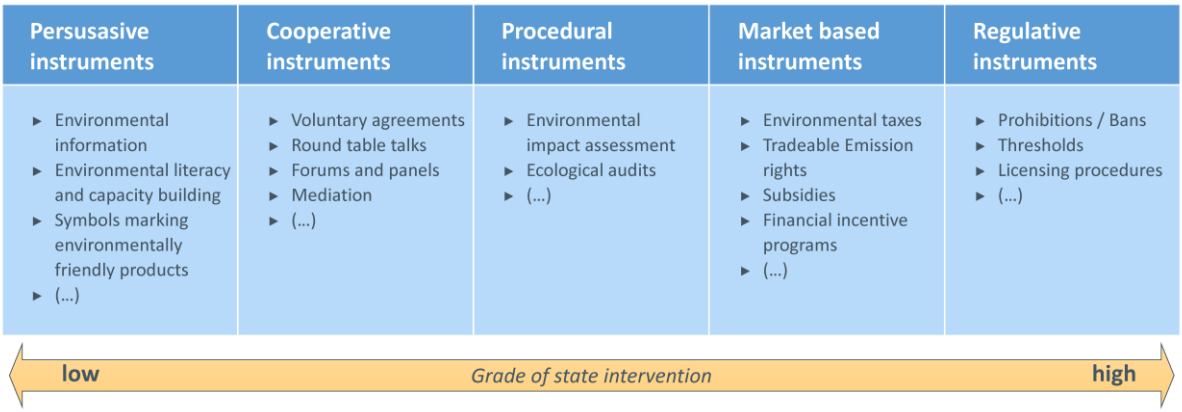
Policy instruments are intended to achieve political goals by influencing the actions of social actors (Böcher & Töller, 2007, p. 305). When applied to the present study, this means that political instruments can be used to achieve the politically desirable goal of bycatch avoidance (anchored, among other things, in international agreements) by influencing the social fishing practice of gillnet fishers.

Achieving political goals is not possible without control in form of political instruments (Böcher & Töller, 2012, p. 74). Especially in the field of environmental policy, these instruments are strongly discussed (Böcher & Töller, 2012): traditional instruments, which mostly work by regulating, are criticized because self-reference and self-reinforcing tendencies of differentiated subsystems of societies, such as science and the economy, do not permit central political control through traditional forms of law anymore (Teubner & Willke, 1984, p. 1). Thus, innovative new instruments are created, such as benchmarking co-regulation or voluntary agreements (Zito et al., 2003, p. 509). With all political instruments, it must be emphasized that they are not value-free techniques, but contain certain world views and ideas about the roles of nature, people, or the state (Böcher & Töller, 2012, p. 76).

Böcher & Töller (2007) form a typology of environmental policy instruments and distinguish them according to the mechanisms with which they attempt to steer the actions of actors, as well as according to the extent of government intervention (p. 74) (Fig. 7). This classification is applied later to make concrete proposals for management instruments and is therefore presented here in more detail. It should be noted that it is common in environmental policy to apply hybrids—in other words mixed forms of different instruments—as well as the combination of several instruments to solve an environmental problem (Böcher & Töller, 2007, p. 83). In addition, instruments alone do not determine environmental success. Rather,

it is the overall structure of the instruments and the political context, among other things, that determine success (Böcher & Töller, 2007, p. 84).

Figure 7: Spectrum of environmental policy instruments. Adopted from Böcher & Töller (2007, p. 306)



3.3.1 Regulatory instruments

Regulatory instruments are traditionally used in environmental policy and aim to influence actors through binding requirements and prohibitions (Böcher & Töller, 2012, p. 76). The coordination mechanism is based in the power of the state. In this respect, the state stands hierarchically above the actor and can enforce compliance with laws by means of coercion and sanctions. Regulatory instruments therefore represent the instruments with the highest degree of state intervention. They have a high binding force and can at the same time indicate which social actions of the actors are socially desirable and which are not (Böcher & Töller, 2012, p. 77). The advantages of regulatory instruments are that they act quickly and are highly effective. This means that environmental hazards can be averted quickly. At the same time, a disadvantage of this form of instrument is that they can be inefficient from an economic perspective (Böcher & Töller, 2012, p. 77). For example, in terms of protecting species from being bycaught, the instrument of compulsory closure of the gillnet fishery can specifically and immediately help to avoid bycatch in gillnets completely. Closing the gillnet fishery means the end of operations for a fisher who only fishes with gillnets and also does not pursue an alternative livelihood. The increasing numbers and complexity of regulatory instruments can also lead to inadequate application of them by enforcement agencies and granting of exemptions by these agencies. In addition, the enforcement of these instruments, especially in the conservation sector, repeatedly leads to conflicts with sector interests (Böcher & Töller, 2012, p. 78). Regulatory instruments generally reflect a management practice of "command-

and-control", which has revealed its limitation in resource management in the past (Armitage et al., 2009, p. 95).

3.3.2 Economic instruments

To avoid such conflicts, market-based instruments have been introduced as an alternative to regulatory instruments. They are instruments that influence the actions of actors and groups of actors through financial means. The coordination mechanism here is the revenue that changes, for example through tax breaks or subsidies (Böcher & Töller, 2012, p. 78). This approach assumes that actors deliberate according to a cost-benefit approach in the sense of rational choice (Esser, 2002), founded in the functional logic of the market (Böcher & Töller, 2012, p. 79). At the same time, the use of these instruments legitimizes the process of rational calculation (Peters, 2002, p. 561). Although economic instruments aim to influence the benefits and costs of individual courses of action and thus their execution, they are nevertheless strongly authoritative (Böcher & Töller, 2012, p. 79). According to a cost-benefit consideration, economic instruments should limit environmental pressuring activities, as long as the costs of the effort are lower than the tax to be paid (Böcher & Töller, 2012, p. 79). However, these instruments are usually associated with high levels of political resistance and conflicts because they make it possible to foresee at an early stage what costs will be incurred by the actors concerned, and if exceptions are obtained, the effects of these instruments run into the ground (Böcher & Töller, 2012, p. 80). Böcher & Töller (2012) conclude that the economic benefits resulting from the use of such instruments are put into perspective when the associated conflicts are considered (p. 80).

3.3.3 Procedural instruments

Procedural instruments derive from system-theoretical considerations that political intervention can only ever succeed to a limited extent in successfully intervening in the functional logic of complex and idiosyncratic systems (Böcher & Töller, 2012, p. 80). These instruments are about consciously approaching companies on how their planning procedures have their own environmental effects, thereby forcing a confrontation with them, but without standardizing the result of the confrontation. This confrontation usually takes place through procedures, for example, for environmental impact assessment (Böcher & Töller, 2012, p. 80).

Since these instruments are aimed at idiosyncratic systems (Böcher & Töller, 2012, p. 80), it remains to be seen whether gillnet fishing can be understood as such a system and, accordingly, whether this form of instrument can be applied.

3.3.4 Cooperative instruments

Cooperative instruments are arrangements between the state and actors or groups of actors. Negotiations between the state and groups are the coordination mechanism of this instrument and should lead to consensual solutions becoming the basis for collective action. There is little hierarchy and control by the state, as the emphasis is on negotiation on an equal footing. These instruments are based on voluntarism, contain relatively few regulations but a high degree of freedom, and have no sanction mechanisms. However, these negotiations do take place under the threat of state intervention (Böcher & Töller, 2012, p. 81). Environmental agreements and commitments are the most important examples of cooperative instruments. The voluntary agreement in Schleswig-Holstein, presented in the introduction, is an example of an agreement to achieve environmental policy goals without legal coercion, even though the legislature, represented by the state of Schleswig-Holstein, was involved in the negotiations. The advantages of this form of instrument are its relatively quick and uncomplicated occurrence and adoption and, since it is based on negotiations, there is increased willingness by the regulated party to implement it (Böcher & Töller, 2012, p. 81). On the other hand, the problems of these instruments lie in their difficult implementation per se as there are no state sanction mechanisms, and associations may have problems in getting their members to participate and comply (Böcher & Töller, 2012, p. 81). Nevertheless, there is a paradigm shift in natural resource management towards adaptive co-management, which is a management practice focusing on group decision-making processes in order to consider different views, shared learning, and the social sources of adaptability and transformation (Armitage et al., 2009, p. 96). Adaptive co-management merges the concepts of co-management as well as adaptive management. Co-management broadly describes the involvement of resource users in resource management, which can be implemented in many different ways, for example through the participation of resource users as advisors (Linke & Bruckmeier, 2015, p. 170). Co-managing establishes vertical institutional linkages and tends to produce short-term and medium-term images, while bridging the local level and levels of government and addressing the capacities of resource users and communities. Adaptive

management focuses on adaptation processes in the medium and long term through learning-by-doing, and concentrates on the relationships, requirements, and capacities of managers. Adaptive co-management thus creates linkages (horizontal and vertical) for joint learning-by-doing among different actors in the medium and long term. It is cross-spatial and concerned with improving and engaging the capacities of all stakeholders for the sustainable management of resources (Plummer et al., 2012, p. 1). Adaptive co-management practice addresses ecological and social uncertainty, which is inherent to governance and can be addressed with collaborative processes and the understanding that multiple types and origins of knowledge are relevant to problem solving (Armitage et al., 2009, p. 96). When the process of adaptive co-management is facilitated by higher-level rules and incentives, it has the potential to make socio-ecological systems more resilient to change (Olsson et al., 2004, p. 87).

3.3.5 Persuasive instruments

Informational instruments try to influence actions through information without compulsion—the coordination mechanism is communication. This form of regulation has the lowest degree of state intervention—there is neither state coercion nor financial incentives (Böcher & Töller, 2012, p. 82). In particular, it involves the education of actors or groups. Actors must first be made aware of many environmental hazards before they can act. This also includes, for example, environmental labels that provide the ecological properties of products (Böcher & Töller, 2012, p. 82). Informational instruments are easy to implement, but have a control effect that is difficult to prove, as they are not linked to sanctions, which is why they are sometimes referred to as soft instruments (Böcher & Töller, 2012, p. 83). In fisheries, for example, there are labels such as ‘MSC’ or ‘Dolphin Safe,’ which informs consumers about sustainably fished products. Currently these labels do not play a role in the German Baltic Sea, since the fish stocks are not in good enough health.

When looking at fisheries management around the world, many different tools have developed and are being applied. While this list has provided a more technical look at generic possible management instruments, the following chapter will introduce the paradigm of the ecosystem approach (EA) to fisheries management that provides a framework for how different policies are approached.

3.4 The paradigm of the ecosystem approach to fisheries management

In fisheries research and management, the ecosystem approach (EA) is widely accepted as a key to develop and improve fisheries management (Young et al., 2008, p. 3). The ecosystem approach focuses on socio-ecological systems (SES) and takes holistic and interdisciplinary approaches to research as well as management:

> "An ecosystem approach to fisheries (EAF) strives to balance diverse societal objectives, by taking account of the knowledge and uncertainties of biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries" (Young et al., 2008, p. 3).

In 2000, the United Nations Convention on Biological Diversity advised the EA to promote conservation and sustainable use of resources in equitable ways (Convention on Biological Diversity, 2000), which was giving institutional legitimation towards a holistic approach on environmental issues. The paradigm has been validated by the fact that different agencies have spread and endorsed it, such as the Food and Agriculture Organization (Fletcher & Bianchi, 2014; Food and Agriculture Organization of the United Nations, 2001). The ecosystem approach has since become a trend in resource management, such as fisheries management (Pitcher et al., 2009, p. 223).

To describe and analyze complex SES, Ostrom (2009), among others, developed a general framework applicable to different disciplines and identified subsystem variables, such as, inter alia, resource units, resource systems, governance systems, and users. As Ostrom (2009) breaks down these complex systems into different units, she contributes to the fact that researchers can approach a topic from a particular perspective other than a systems theory perspective to examine individual groups of actors or institutions, among other things (p. 420). Following an ecosystem-based approach does not only mean including social science, but also other disciplines such as technical-oriented disciplines, ecological multispecies research, and models or economic research, at the same time (Young et al., 2008, p. 6). The authors argue that social dimensions of socio-ecological systems are still poorly understood, including knowledge and practice as key cultural dimensions within SES (Poe et al., 2014, p. 166), while the institutional part of SES has been undergoing some research (Hassler et al., 2013, p. 226). Although there is a management turn towards holistic approaches specific to the EA, studies

show that even with an EA management philosophy underlining the development of environmental action plans, actual implementation and factors influencing the implementation, such as finance, monitoring, and enforcement, are unlikely to lead to new management modes (Hassler et al., 2013, p. 225). Additionally, although the EA is considered relevant in research and management, the concept was criticized as being too vague and generic to provide guidance for actual management or research (Lidström & Johnson, 2020, p. 219). Decade-long pleas from social scientists to include their research and actually practice the EA to management in fisheries can be taken as an indicator that there is still a gap in this area (Young et al., 2008, p. 6). Especially in fisheries research there has been an emphasis on taking on a social science perspective in order to generate a better understanding of fishers and therefore adapted fisheries management (e.g., Sønvisen, 2014; Hall-Arber et al., 2009). In order to move towards an ecosystem-based management, research and also institutional structures that facilitate, inter alia, science, society interaction, and policy, all need to be structured accordingly (Olsson et al., 2008, p. 9489).

In the sense of solution-oriented approaches this thesis situates the analysis of fisheries in an EA to fisheries management. While the theoretical insights and concept that have been introduced so far are plausible to numerous research questions, ecosystem approaches illustrate the application of the research perspective in a specific context, namely the ecosystem of the German Baltic Sea. It essentially means that fishers and their social practices are seen and managed as part of the Baltic Sea ecosystem and are not independent of other parts of the ecosystem.

3.5 Summary

In the broad context of Natural Resource Sociology, the question of the social fishing practices of gillnet fishers in the German Baltic Sea is explored as a form of human-nature interaction. Especially in the North American context, Natural Resource Sociology has developed strongly in order to investigate human-nature interactions and to conduct natural resource management based on these findings. The focus of this work is on the social practice of actors in their use of natural resources, but also on their embedding in the structures that surround them and are action-guiding to their practices. Praxeological perspectives, and in particular Giddens' structuration theory, allow to look at social practices as a result of the interplay

between structures and actions. It is of central importance that there is a duality of structure, which means that structures can both enable and limit actions. Meanwhile, actions can reproduce structures but also modify them. Following this basic idea, structuration theory offers the vocabulary to explore social fishing practices in general and bycatching practices in particular, by looking analytically at rules and resources (which make up the structures) as well as the importance of communication, sanctions, and power for the performance of social practices. This practice, in turn, is closely linked to the concept of routine, which is the dominant form of everyday action. It has great potential to reproduce established social practices over a longer period of time. Nevertheless, actors also possess agency—albeit to varying degrees—to establish new practices. By combining complementary and mutually deepening approaches of social practice, agency, materialities, and environmental management principles, an attempt was made to show a holistic picture of the embeddedness of social practices in fisheries. It must be considered that the extension of structuration theory to include actants was only considered here in order to enable a critical examination in the context of natural resources. Nevertheless, it showed that the limitations of structuration theory can be compensated for by reference to other theories, and its basic understanding provides great added value for the consideration of human-nature interactions.

"Developing and unfolding qualitative methods further means […] also setting out in the direction of inter-disciplinary research and application science."

(Bohnsack & Marotzki, 1998, p. 8)

4 Methodology

Giddens focuses his work on the development of a theory, but does not describe a methodology that can guide studies of social practices. Although praxeological theory is becoming quite popular, so far there is little literature giving advise on how to study social practices, depending on the research question (e.g., Schäfer, 2015). The following chapter elaborates on the research process, providing the theoretical basis as well as describing the empirical data collection in detail.

The empirical research starts with an ontological understanding of the life and situation of the gillnet fishers in the Baltic Sea through the establishment of a typology. Gillnet fishers' perspective from a sociological point of view apparently has not been considered systematically in Germany. The knowledge gain achieved with a typology of fishers is manifold. It gives insight into the fishers' lives and professional practices and provides orientation in order to derive and evaluate intervention strategies (Schmidt-Hertha & Tippelt, 2011, p. 23). Parallel to developing the typology, together with colleagues from the Thuenen Institute of Baltic Sea Fisheries an expert workshop was conducted with participants with different expertise, inter alia in fisheries management and environmental issues. The aim of the workshop was to stimulate management instruments for bycatch mitigation as well as talk about their feasibility, advantages, and disadvantages. The knowledge generated in the workshop was later applied to debate different management instruments in the light of the ontological understanding of the gillnet fishers.

4.1 Interviews with fishers

Typologies uncover social structures and therefore show that developments are not individualistic (Schmidt-Hertha & Tippelt, 2011, p. 23). Furthermore, the identification of different types of actors can provide indications to conditions and constraints in the emergence and institutionalization of envisaged social practices (Henkel et al., 2019, p. 13).

As was previously elaborated, efficient management systems need to be based on an ontological understanding of fishers' practices and their possible responses (Sønvisen, 2014, p. 193) as well targeted on specific situations and specific participants (Young et al., 2008, p. 82). "Thus, understanding the factors shaping fishers´ behavior (and developing the ability to accurately predict fisher response to changing incentives) can inform and improve the effectiveness of resource management" (Abernethy, 2010, p. 75). Therefore, before suggesting specific management recommendations it is inevitable to acquire insight into the different types of gillnet fishers.

The first part of this chapter will treat the sampling of the fishers, which was conducted and described by a colleague in a joint publication. Then the methodology of problem-centered interviews (Witzel, 2000) is presented. Qualitative interviews, such as the proposed guided interview method, allow access to tacit and explicit knowledge as well as interpretative schemes used in social practices through reconstructing methods. After a theoretical introduction the interview guideline will unfold and its rationale will be explained. The data collection process is reflected as part of the empirical research. After collecting the data, analysis was conducted using the documentary method to identify a typology of German gillnet fishers. The documentary method was first explained by Bohnsack, referring to different theories: ethnomethodology, knowledge sociology and theory of practice, and habitus, basing the method on a praxeological knowledge sociology (Bohnsack et al., 2013, pp. 9). Nohl (2010) further elaborated upon the method for the analysis of interviews aiming at reconstructing the implicit regularity of experiences documented in the data material (p. 51). After elaborating on the theoretical background of the method, parallels are drawn to theory of structuration, indicating their common epistemological frame. Moreover, at the end of this chapter, the individual steps of analysis up to the development of a typology within the documentary method are presented.

Due to the work in the STELLA project, the data collection and data analysis were to a large extend conducted by myself as primary investigator, except for some intervals where colleagues were involved. Nevertheless, during these steps I was instructing and supervising the collaborative work. I will appropriately indicate where the workload was shared.

4.1.1 Selection of relevant fishers

Considering that only a fraction of all fishers can be interviewed we needed to find a plausible way to narrow down the sample of fishers. To make sure that only fishers with bycatch experiences were included in the sample, an analysis to identify these fishers took place before the interviews were carried out.

The following paragraph was written by Steffi Meyer and was extracted from Barz et al. (2020, p. 2).

The selection of relevant fishers was based on an upstream study that separated the German Baltic gillnet fleet into groups of vessels with distinct annual landing sequences (Meyer & Krumme, 2021, p. 1). Groups with the highest potential risk of bycatch were selected based on two factors: First, their characteristic seasonal fishing patterns, that is their regular activity throughout the year. Only vessel groups with regular recorded landings were selected. Second, those remaining groups were ranked according to their number of fishing trips, which was used as a proxy for fishing effort (Tregenza et al., 1997, p. 897). In order to concentrate research efforts on the most relevant groups, the study focused on the three groups with the most fishing trips in 2016, assuming that a higher number of fishing trips increases the risk of incidental bycatch. These three groups of vessels with distinct annual landing sequences were the cod-group (cod), the herring-cod-group and the herring-flounder-group, from which then fishers were selected for interviews. It was possible that fishers were part of more than one group if they operated more than one vessel (Meyer & Krumme, 2021, p. 3). Further narrowing down the pool of potential fishers within each group, the focus was set on ports with the most landings within or close to Natura 2000 sites, which are protected areas that aim amongst others to conserve certain bird species and harbor porpoises. In these ports, fishers were selected based on their descending amounts of landings and contacted by telephone. Additional fishers were selected opportunistically by meeting them in the relevant ports or by snowball sampling of fishers' contacts. Based on the selection criteria, the most relevant ports for the cod-group were situated close to the island of Fehmarn (Fig. 8) and the most relevant ports for both the herring-flounder-group and the herring-cod-group were located around Greifswald Bay (Fig. 8). Additional interviews where held with fishers located between Kiel and Flensburg. In total 22 valid interviews were achieved (Barz et al., 2020, p. 2).

Figure 8: Map of the German Baltic Sea, locating the research sites (©Nakula Plantener, Annemarie Schütz, Thuenen Institute of Baltic Sea Fisheries) (Barz et al., 2020, p. 4)

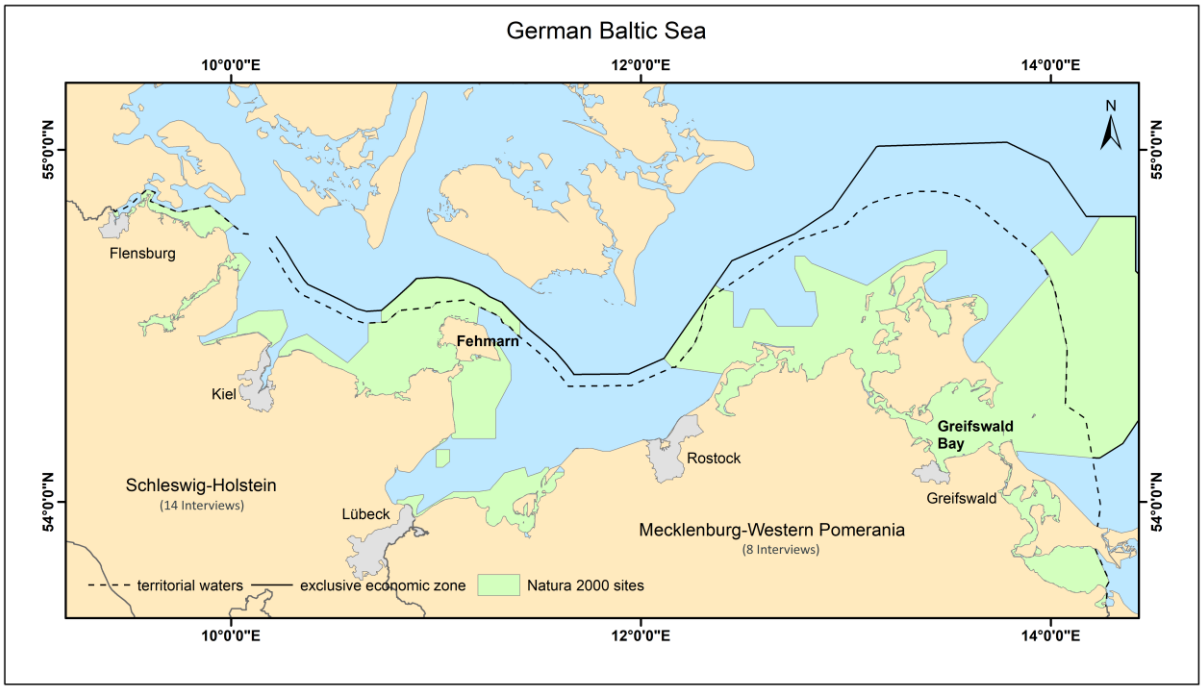


Table 2: Sample of interviewed fishers

Number; level of education[13]	*Age*	*Distinct annual fishing group*[14]	*Years of professional fishing experience*[15]	*Previous training*	*No of vessels*	*Federal state of origin*[16]	*Inter-viewer*[17]
F1; dbs	66	Cod	43	Y	2	SH	JE
F2; ssc	49	Herring-Flounder	32	N	6	MWP	JE
F3; dbs	52	Cod	39	N	2	SH	JE
F4; dbs	39	Cod	19	Y	1	SH	FB
F5; dbs	69	Cod	55	N	1	SH	JE
F6; ssc	38	Herring-Flounder	21	N	2	MWP	JE
F7; dbs	46	Cod	26	Y	1	SH	JE
F8; ssc	50	Herring-Flounder	34	N	3	MWP	JE
F9; not provided	50	Cod	29	Y	2	SH	FB
F10; dbs	38	Herring-Cod	30	N	3	MWP	JE
F11; dbs	29	Cod	13	N	1	SH	JE
F12; ssc	42	Herring-Flounder	26	N	2	SH	FB
F13; not provided	63	Cod	48	N	2	SH	FB
F14; not provided	57	Herring-Flounder	32	N	1	SH	FB
F15; ssc	51	Herring-cod	34	N	3	MWP	JE
F16; dbs	38	Cod	22	N	1	SH	JE
F17; ssc	56	Cod	40	N	6	SH	JE
F18; not provided	53	Cod	26	Y	2	SH	FB
F19; ssc	47	Herring-Cod	27	N	3	MWP	JE
F20; dbs	62	Cod	28	N	1	SH	JE
F21; not provided	57	Cod	36	N	2	MWP	FB
F22; ssc	53	Herring-Flounder	36	N	1	MWP	JE

[13] ssc = secondary school certificate (Realschulabschluss); dbs = diploma of basic studies (Hauptschulabschluss)

[14] Based on logbook data from 2016 (Meyer & Krumme, 2021).

[15] It was requested not to count years of fishing before receiving a fishing diploma; however, some fishers provided information that included periods of fishing before receiving the diploma

[16] MWP – Mecklenburg-Western Pomerania; SH – Schleswig-Holstein

[17] FB – Fanny Barz; JE – Josefa Eckardt

The process of selecting fishers was conducted together with Steffi Meyer and based on her distinction of different fishing clusters as shown above. The interviewed fishers were mostly above the age of 50—only 9 fishers were under 50 years old, which also lead to average age of 50 years. All of them had a lot of experience in fishing, while some of them were qualified in a different occupation before they went into fishing. During the transcription and in the quotes presented in this thesis, all references to identity, home port, place of residence, or ties to a cooperative were anonymized and fishers were assigned numbers to conceal their identity (Table 2).

4.1.2 Problem-centered interviews

The meetings were conducted through problem-centered interviews. Considering that the first research question is based on individual experience about the social fishing practice and the bycatch experience of fishers, this question can only be answered by qualitative social science research. It makes it possible to grasp people in their subjectively constructed complex world and is characterized, among other things, by openness, communication, and its procedural character (Lamnek, 2005, p. 20). Qualitative research makes it possible to determine individual human actions based on the meaning that the individual ascribes to the situation at hand. Theoretical assessments then emerge in the course of the qualitative research process, which means that hypotheses are first generated in the course of scientific investigations, which are based on the data that manifest themselves in this process. Hypotheses arise because in the research process the researchers are required to be open to new developments and dimensions that can then be incorporated into the formulation of the hypotheses (Lamnek, 2005, p. 21). In praxeological understanding, the question about the meaning of an action is the question about the generative pattern of the production process of social practices. Observations of social practices, which can be given by narratives and descriptions by the research subjects, are the prerequisites to identify generative patterns of actions (Bohnsack, 2013, p. 248).

Accordingly, only a form of qualitative interview came into consideration for this study, as it enables to consistently capture the subjective perspective of the interviewees, more precisely their individual actions, subjective perceptions, ways of experiencing, and knowledge production (van der Klis, 2011, p. 34). Since the research topic included various focal points

of significance, it was decided to apply the technique of problem-centered interviews (PCI) (Witzel, 2000). PCIs allow for the interviewer to reflect prior knowledge and use this knowledge during interviews as well as offer flexibility towards the research objective. During problem centered-interviews prior knowledge, which is unavoidable and needs to be disclosed, serves as a heuristic-analytical framework and guides the interview questions (Witzel, 2000, p. 1). Besides covering topics of the researchers' interest, PCIs allow for openness towards fishers' self-set relevancies during the interviews, which are stimulated by narrative questions (Witzel, 2000, p. 2).

The three basic positions of the PCI can be outlined as follows: (i) problem-centeredness, (ii) object-orientation, and (iii) process-orientation (Witzel, 2000, p. 2).

(i) Problem-centeredness describes the orientation of the interview to a socially relevant problem and describes the process of a preliminary interpretation based on prior knowledge. The interviewer uses the prior knowledge about the research interest to comprehend the interviewee's explanations and to ask steering questions and follow-up questions oriented towards the problem of interest. Therefore, broad and differentiated data material can be produced (Witzel, 2000, p. 2).

(ii) Object-orientation emphasizes the flexibility of PCIs with respect to the different requirements of the research topic. A biographical part of PCIs refers to the development of schemes of interpretation, when actors are confronted with their social reality. Following the requirements of an interviewee-centered communication situation, the interviewer can use different interview techniques. Depending on the different reflexivity capabilities of the interviewee, the interviewer can apply more narrative stimuli or supportive questions like steering questions during the interview (Witzel, 2000, p. 2).

(iii) Process-orientation refers to the entire research process. Trust and openness arise, if the respondents feel that their perspective is taken seriously. This relationship promotes memory and motivates self-reflection. By allowing the respondents to express a problem from their perspective, they repeatedly develop new aspects on the same topic as well as corrections and redundancies to previous statements. Redundancies often contain new formulations that facilitate interpretation, while contradictions can express individual ambivalences and indecisiveness that should

> be addressed. Contradictions can also be an expression of orientation problems and decision-making dilemmas in the face of conflicting demands (Witzel, 2000, p. 2).

The problem-centeredness of the research question is given by the focus on bycatch as a socially relevant problem. In particular, prior knowledge of the organizational and legal framework of small-scale coastal fisheries in the German Baltic Sea, the conflict around bycatch of seabirds and marine mammals, as well as other social science studies on fishers was applied in the design of the guideline and the subsequent interpretation of the data. This allowed for targeted and sensitive questions to be asked. At the same time, the open nature of the wording of the questions allowed fishers to set their own relevancies. The object-orientation and the flexibility within the interviewing process are reflected in the use of different types of questions in the guideline. Both biographical narrative questions and steering-questions were asked, which provided a certain structure for the expected answers. As a result, parts of different interviews were easier to compare, it was possible to lead the conversation back to the focus in cases where interviewees digressed.

The PCI contains four instruments: an audio recording of the interview, the guideline (see App. A), a short questionnaire (see App. B), and a postscript written afterwards (Witzel, 2000, p. 3). An audio recording is essential for qualitative interviews and serves as the basis for the subsequent transcription of the interview. The guideline provides orientation and increases comparability, but rather serves as a memory aid in the background so as not to disrupt the narrative flow. The short questionnaire offers the opportunity to collect social data, thus relieving the interview from a classic question-answer game (Witzel, 2000, p. 3). In the postscript, the first impressions, comments on the overall situation, spontaneous interpretation ideas, and content from the conversation after the recording was stopped were described.

The interview guideline was constructed under the assumption that factors such as norms, habits, motivation, professional biography, attitudes, and character contribute to the social fishing practice and bycatch practice. The design of the guideline (cf. App. A) was oriented towards narrative-generating questions, probing questions, and ad hoc questions. At the same time, elements such as mirroring, comprehension questions, and confrontations were applied (Witzel, 2000, p. 3).

The interview started with the opening question of how the gillnet fishers got into fishing. It was generated as a narrative impulse rather than a question. At the same time, it was emphasized that the interviewer was interested in everything the fishers had to say about this topic and pointed out that the interviewees should take their time to tell their stories. The narrative stimulus was biographically oriented, which increases the possibility that the fishers will reveal narratives right at the beginning of the interview. At the same time, this question serves to later reconstruct different occupational biographies and thus describe dimensions of a type. The stimulus was constructed openly so that fishers could project their own relevant experiences and elaborate on them. In the context of the question about the occupational biography, it was possible to ask specifically about investments in the company in order to document how and whether there is a willingness to invest, for example, in newly developed technology. Next, a closer look was taken at the interviewees' attitudes towards fishing and fishers were asked to elaborate on what they particularly like about fishing. This part of the questionnaire was aimed at argumentation rather than narration. It was based on the hypothesis that different motives for practicing fishing could be considered in fisheries management. To generate an understanding of fishing practices in general, fishers were asked about their last day of work. On the one hand, this specific question about the last day rather than an average working day was intended to stimulate recollection. On the other hand, it was intended to generate a stringent narrative that was not merely generalized. Different fishing practices and coping strategies could then also be applied to contribute to a typology. Additionally, this question was used to clarify marketing strategies and level of organization of the fishers. Where necessary, this information was obtained through specific inquiries. Furthermore, various enabling and constraining factors in the lives of the fishers could be evaluated in the context of the description of everyday working life, to which later management proposals could be linked. Where this was not apparent at first, later on specific questions were asked about the biggest challenges in fishing. This question assumed that these were challenges that could be caused or resolved through management. Up to this point in the guideline, fishers had the opportunity to present their narratives and opinions as experts in fishery. This was followed by the issue of bycatch. The topic was intentionally not placed at the beginning of the interview, even though typically the first narrative stimulus already puts the focus on the research subject (Witzel, 2000, p. 3). However, since this was a sensitive topic that required a basis of trust, the first questions were also asked with the aim

of creating a familiar atmosphere. In order to approach the topic of bycatch, a narrative impulse was used in the interviews that did not contain any judgmental wording. The aim was to record how bycatch is dealt with in order to reconstruct, in a documentary sense, how bycatch is practiced and what interpretive schemes are applied. The process-orientation in the conduction of the interview was particularly evident in this sensitive topic. By posing the question in a way that did not convey a moral valuation of bycatch and showed understanding for its occurrence, an openness to the fisher's perspective was to be conveyed. However, from the fishers' point of view, the topic is biased by the requirements of international agreements or nature conservation organizations, so it was not always possible to create an atmosphere of trust in which the topic could be discussed. Redundancies and contradictions became particularly apparent in these parts of the interviews and could not always be clarified. This topic was followed by the inquiry of how bycatch is avoided and what the problem with bycatch might be. However, the latter question was discarded after a few interviews because it was perceived as confusing by the fishers. In the second half of the interview mostly ad-hoc questions were applied. Fishers discussed different fishing tactics, such as the use of and attitudes towards alternative fishing gears to gillnets. They were asked about their experiences with alternative gears and under which conditions they would use them. Then, different management scenarios, such as the voluntary agreement of Schleswig-Holstein and the fishers' engagement in management, were discussed. Furthermore, the economic sphere of fishing was explored. Fishers were asked whether they have other sources of income besides fishing and whether they would pursue the profession even if they did not have to so for financial reasons. This was mainly to address the question of the importance of alternative or complementary livelihoods and to find out if incentives for bycatch-mitigation practices could be set in this area. In order to find out what fishers were experiencing in terms of compliance with fisheries regulations, a narrative-generating question was applied again. The fishers were asked to describe how an inspection by the fisheries inspectorate is conducted. To conclude the interview, the guideline asked about the fishers' professional future and the future of gillnet fishing in general. The interview closed with typical "wish" questions, where fishers were asked what they would wish for from fisheries management and whether there was anything else they wanted to add. The guideline was complemented by a short questionnaire (cf. App. B), which asked for different socio-demographic data such as age, years of fishing experience, education, income, and quotas.

4.1.3 Data-collection process

The potentially relevant fishers were selected (cf. chapter 4.1.1.) and contacted by phone. A first step in this process is to adequately inform the potential interviewees about the nature of the survey (Przyborski & Wohlrab-Sahr, 2014, p. 67). This meant that the research interest of bycatch was already mentioned on the phone and it was emphasized that the interest lies in an in-depth conversation with the fishers about their fishing practices and their perspectives. This also meant that fishers were asked to spare an hour for the interview. Although in most cases the interviews lasted much longer (between 45 minutes and 3 hours, with most interviews lasting about 90 minutes), this was never a problem for the fishers, because they were prepared that the interview asked for some more of their time. The recruiting of interview partners proved rather difficult. It took a lot of time and effort to reach the fishers on their phones and sometimes hostility was noticed when the interviewers mentioned that they were doing research for the Thuenen Institute of Baltic Sea Fisheries on bycatch. Due to the peculiarities of the fishers' everyday professional lives, such as dependence on the weather, the interviewers tried to call before stormy days or during closed seasons for certain types of fish (e.g., cod spawning closure). Once a meeting was initiated, the interviewers met the fishers at a place of their choice, where they would feel comfortable to talk. This meant that the interviews were conducted mostly in their homes, but also on their vessels and one even in a public café, which was not ideal for a sensitive topic such as bycatch. After a quick introduction of the interviewer and again of the research interest, the form of interview was further explained. This included emphasizing the specifics of problem-centered interviews, which work differently to questionnaires and require rather elaborate answers. Before the start of the audio recording data privacy issues were addresses and written consent was given by the fishers to conduct the interview and use it for analysis later. Only then did the interview according to the guideline and the audio recording start. After an interview was completed, memos were written about thoughts on first impressions and interpretations, about deviations or unique features during the interview, or about what was discussed before and after the audio recording was running.

Reflection of the data collecting process

The relationship between fishers and Thuenen Institute of Baltic Sea Fisheries is rather ambivalent, so to speak. Some fishers did not have an issue at all with talking to a researcher, while others, for different reasons, had a rather difficult time warming up to the idea of collaborating with the Thuenen Institute. The interviewers were identified as direct representatives of the Thuenen Institute of Baltic Sea Fisheries and all its work. The interviewers also met fishers, who had been part of different research projects over the years. There were indications that they were tired of participating in any kind of research, especially where they didn't get any feedback about the research.

Although the narrative stimulus of the interview guideline left room to elaborate on the entry into fishing, some interview partners immediately started talking about bycatch or have fallen into a monologue about the current fishing situation. In these instances, it was rather difficult to follow the planned procedure and it asked a great deal of flexibility from the interviewers. Sometimes there was not enough time to start the recording in time or to talk about the data privacy policy. This is attributed to the fact that fishers actually seized the opportunity to talk to a researcher from Thuenen-Institute of Baltic Sea Fisheries, which could underline a need of more communication from research institutions.

Due to my maternity leave and pressing time issues of the STELLA project, I could not conduct all the interviews myself (Table 2). Other interviews were conducted by a colleague, who I instructed before I left.

4.1.4 Analysis with documentary method

In order to analyze the interviews that were collected using problem-centered interviews, the reconstructive approach of the documentary method was chosen, as mentioned before. The documentary method draws in large part on Mannheim's sociology of knowledge, supplemented by critical engagements with other reconstructive approaches, such as ethnomethodology. In contrast to ethnomethodology, which is not able to address socially conditioned differences in the production of order, the linking of knowledge with its social embedding is the basic principle of the documentary method (Meuser, 2013, p. 232). In order to reconstruct this knowledge, the understanding of the different levels of sense is relevant. Sense is divided into immanent and documented sense. On the one level, the immanent sense

means that people report their experiences and thus refer to the literal and explicit content of sense. The immanent sense can on the one hand be understood as a subjectively meant and intentionally expressed sense, which reveals the intentions and motives of the narrator, but is not empirically accessible. And on the other hand, it can be understood as objective sense, which explains the general meaning of an action. In the documented sense, experiences are reconstructed as a document of an orientation that structures bespoken experiences. The documented sense is about how the text is constructed and in which orientation frame topics are negotiated (Nohl, 2012, p. 2). As will be explained later on, the capture of the objective sense takes place during formulating interpretation, and the reconstruction of the documented sense takes place during reflective interpretation (cf. chapter 4.1.4.)

This perspective also expresses itself in the division of different forms of knowledge into communicative-generalized knowledge and subjunctive knowledge (Mannheim, 1980, p. 211). Subjunctive knowledge is understood as atheoretical knowledge, which is embedded in the social practices of actors and is self-evident, implicit, and tacit knowledge (Thomsen, 2020, p. 204). The social practice, as it can be reconstructed in narratives, is bound to the practical knowledge of action. The implicit nature of information can therefore not easily be made explicit, but can be collected and reconstructed through narratives and descriptions (Nohl, 2012, p. 43). The basic assumption that action guiding knowledge cannot necessarily be made explicit by actors (Bohnsack et al., 2013, p. 12) can also be found in Giddens' remarks on practical consciousness and routine (Giddens, 1984) (cf. chapter 3.2.5 and 3.2.4). The social context of action and knowledge within which subjunctive knowledge emerges and operates is the subjunctive space of experience (Mannheim, 1980, p. 215). The subjunctive space of experience refers to structurally identical experiences and is not only constituted by common experience in the sense of a co-presence of experience (Mannheim, 1980, p. 222). As opposed to subjunctive knowledge, there is also communicative knowledge, which refers to bodies of (societal) knowledge that are explicitly available to actors (Mannheim, 1980, p. 289). Communicative knowledge captures common-sense theories, which includes knowledge about normative expectations, legitimations, and role relations. Thus, on a communicative level, generalized expectations can be reflected with respect to social realities. Communicative and subjunctive knowledge lead (orient) actions differently: in the case of communicative knowledge, for example, knowledge of institutionalized norms concerning a certain group, Bohnsack speaks of orientation schemata; in the case of subjunctive

knowledge, for example, knowledge of a shared social practice within a group, Bohnsack speaks of orientation frames (Bohnsack, 2012, p. 122). Both forms of knowledge are implicit in everyday communication and can be reconstructed accordingly (Bohnsack, 2012, p. 122)). Mannheim concludes that it is not the objective sense of an action (the *What*) that needs to be researched, but the documented sense (the *How)* (Mannheim, 2004, p. 115; 125). Thus, it is not a matter of researching the "truth" or cultural and social facts, but of focusing on the question of performance and analyzing how these social facts are produced (Bohnsack, 2018, p. 53).

Compatibility of structuration theory and documentary method

This paragraph comments on structuration theory as well as the documentary method and refers to compatible concepts, even if they use different terminologies. Structuration theory is—as well as the theoretical understanding behind the documentary method—a praxeological approach to understand social practices. The appropriate methodological means to correspond to the prescribed dimensions of structure and social actions (Fig. 5) can be found in the methodology of the documentary method. Giddens elaborates on Mannheim's understanding of ideology and shows common roots on Marx and Hegel (Giddens, 1979, p. 168). However, he does not explicitly place Mannheim in his theory. Dimensions of social practices can be determined not only by observing social practices but also show themselves while interviewing agents that are participating in these social actions and therefore grant access to the modalities, which are the intersection of structure and action (Giddens, 1984, p. 29). During problem-centered interviews, open questions allow fishers to develop their own relevancies and express experiences that allow to reconstruct orientation frames, which are the interpretive schemes between structures of signification and actions.

The reconstruction of social practices aims at reconstructing underlying habitualized orientation knowledge, which structures these practices relatively independent from the subjective meaning (Bohnsack et al., 2013, p. 9). Following the knowledgeable actor from Giddens it is therefore necessary to access this knowledge and show what interpretative schemes guide the practices. Giddens and Bohnsack—who is included here as a representative of the documentary method, even if, as elaborated before, he is not solely responsible for it—

look at the different forms of knowledge from the same perspective: atheoretical knowledge, which is action-guiding knowledge, structures social practices milieu- and culture-specifically (Bohnsack et al., 2013, p. 14). Action guiding knowledge can thus be located in practical consciousness, which allows routinization of everyday action and is the place where criteria and schemata of rules are anchored (Giddens, 1984, p. xxiii). Therefore, if the documentary method allows access to action-guiding knowledge, this is understood as access to the practical consciousness (and therefore rationalization) as understood by Giddens. As shown in the theoretical part of the documentary method, what Giddens refers to as implicit as well as practical knowledgeability can be accessed via reconstruction of the documented sense (through reflective interpretation), whereas the discursive knowledgeability of actors can be accessed via the objective sense (through formulating interpretation).

During face-to-face interactions actors process criteria and schemata (Reckwitz, 2007, p. 322), which makes them accessible through direct communication, as can be elicited with PCIs (Witzel, 2000). Nohl also emphasize the access to social practice via interviews, which are produced in face-to-face interaction with the interviewer (Nohl, 2012, p. 13). Following on these lines, one can also find Giddens' emphasis on the importance of semiotics in the analysis of the structural moments of social systems (Giddens, 1997, p. 83). The access to social practices is most promising, when interviewees use comprehensive narratives during the interview, which are the basis to deduct orientation frames which later form typologies. The guideline of the PCI applied in this study consists inter alia of narrative provoking stimuli and is therefore utilizing the face-to-face interaction with the interviewees to reconstruct social practices.

Since this thesis is focusing on the social practices of fishing, the focus lies on the practical and discursive knowledge of fishers as they can be accessed through narratives generated in the interviews. For example, will the way agents discuss bycatch of marine birds and mammals reveal interpretive schemes applied for bycatch practices? The approach of the documentary method also allows to access information on how authoritative resources, which inter alia describe the skills and capacity to organize life chances (Giddens, 1984, p. 258), are applied by actors. Furthermore, PCI and the documentary method can identify how allocated resources, which are the availabilities of material aspects of social life (Giddens, 1984, p. 258) are used and which role these resources play in the social practice of gillnet fishing.

Documentary method in research practice

Discussions on the formation of types usually take their starting point from Max Weber's ideal types (Bohnsack, 2013, p. 241).

"An ideal type is a purposefully constructed concept that organizes and captures sections of social reality by highlighting and often intentionally exaggerating the essential aspects of social realities. In this respect, it represents an ideal image and is therefore distinct from the empirically average real type" (Hillmann & Hartfiel, 1994, p. 348).

In this thesis, the analysis of orientation frames leads to different types of fishers that went beyond the fishers' personal experiences, meaning the types are based on orientation frames which are supra individual.

The documentary method ties in with the narrative structure analysis based on Fritz Schütze (1983) and works in distinctive working steps (Nohl, 2012, p. 39). In the first step of the documentary method a formulating interpretation is conducted (steps (i) and (ii)), followed by a reflective interpretation (steps (iii) and (iv)), which is about generating orientation frames and making them conceptually explicit. During the next step, orientation frames are specified into a (v) sense-genetic typology, followed by the generation of a socio-genetic typology, which locates types within a typology that distinguishes these types from or relates them to other types, such as milieu types (Nohl, 2012, p. 39) (Table 3). At this stage a generalization of the types can be reached (Bohnsack, 2013, p. 249).

Table 3: Steps of analysis in documentary method (Nohl, 2012, p. 39)

Steps of analysis in documentary method	***Interim steps of analysis in documentary method***	
Formulating interpretation	(i)	Working out the thematic developments and identifying themes and sequences of interest
	(ii)	Formulating detailed interpretation
Reflective interpretation	(iii)	Interpretation with separation of text types
	(iv)	Comparative sequence analysis
Generating a typology	(v)	Sense-genetic typology
	(vi)	Socio-genetic typology

(i) The formulating interpretation of interviews begins before the transcription of the interviews (Nohl, 2012, p. 40). On the basis of the audio recording, thematic developments were worked out and thus the chronological progression of themes within a case was described. This allowed identifying themes and sequences that were of particular interest to the research question even before transcription. Passages selected for interpretation are characterized by their relevance to the research question (Bohnsack, 2013, p. 250). Through the use of problem-centered interviews, the interviewing process specifically directed the focus on the research question. Nevertheless, in addition fishers continued to develop their own relevancies, characterized primarily by a high level of detail (Bohnsack, 2013), which also found consideration in the choice of passages to be interpreted. After selecting the passages, the selected passages of the interviews were transcribed by research assistants, applying a specific set of rules, adapted after Nohl (2012, p. 123) (App. C). Subsequently, the transcripts were imported into F4 Analysis to pave the way for computer-assisted analysis.

(ii) Based on the transcribed interviews the formulating detailed interpretation started. In the course of this, head-themes and sub-themes of the sections were identified. A summary in the authors' own words of the formulated themes were written accordingly. This was done to alienate the text to the researcher and thus to emphasize that the thematic content is not self-evident but requires interpretation (Nohl, 2012, p. 41). During the process of formulating interpretation (and the coupled process of reflective interpretation as well) *research workshops were held regularly with a varying group of colleagues from the Thuenen Institute of Baltic Sea Fisheries in Rostock with different professional backgrounds, discussing interpretations of the anonymized transcripts to ensure that the interpretation was exhaustive and verified, modified, or falsified. This group process, which interspersed the individual interpretation-processes by the first author, aimed at transparency and reproducibility of the analysis* (Barz et al., 2020, p. 3). During these meetings it became particularly clear that at the first moment there were different interpretations as to which word choice was appropriate for the detailed interpretation, which again showed the added value of this group.

(iii) While the question of *what was said* was pursued in the formulating interpretation, the *how it was said* was brought into focus of the reflecting interpretation in order to find out in which orientation frames topics were addressed (which translates to their *modus operandi*). Especially narratives, which are the result of successful narrative question framing, allow conclusions to be drawn about the orientation frames (Nohl, 2012, p. 41). These passages present descriptions, arguments, and evaluations, which were then analyzed as the first interim step of reflective interpretation based on Schützes narrative analysis during the process of formal interpretation. Narrative analysis is a form of semantic interpretation, where the text types, narratives, descriptions, argumentations, and evaluations are distinguished and separated (Nohl, 2012, p. 41). During narratives actors depict courses of action that have a beginning, an end, and a temporal development. Although interviewees tell about their experiences, this must not be confused with the "truth." However, in passages in which the constraints of an impromptu narrative take effect and interviewees complete, condense, and detail their narrative, it can be assumed that there is a close connection between lived and narrated experience (Nohl, 2012, p. 42). Descriptions, on the other hand, constitute of recurring courses of action or fixed things. Argumentations are everyday-theoretical summaries of the motives, reasons, and conditions for agents' own or others' actions. Evaluations, on the other hand, are assessments of actions—either fishers' own actions or the action of other people. In the argumentative and evaluative parts of the interviews, the interviewees take the communication situation of the interview into account and explicate and theorize motives and reasons to the interviewer. Schütze therefore ascribes to these passages a strong contextual reference to the narrator's present point of view (Nohl, 2012, p. 42). Narratives and descriptions are most capable of providing information about the experience of social practice and, in this sense, enable the reconstruction of it. The action-guiding knowledge anchored in them cannot be made explicit by the fishers, but can only be narrated or described. These text types thus serve to make atheoretical and conjunctive knowledge of social practices accessible (Nohl, 2012, p. 43). However, argumentations and evaluations can also have their added value for the reconstruction of social practices. They are

explanations of motives for action, which are meant to plausibilize these motives to the interviewer. They can be interpreted in documentary terms by reconstructing the way they are constructed and by elaborating the modus operandi of how actions are justified and evaluated, thus providing information about the orientation frames in which they are dealt with (Nohl, 2012, p. 43). The separation of text types and semantic interpretation are only analytically separable procedures, which, however, coincide during the analysis. The separation of text types considers the experiences of the actors without adopting their subjective attributions of meaning (Nohl, 2012, p. 44). In semantic interpretation, the analysis detaches itself from the subjective attributions of meaning by the actors and thus gains access to the social practice, which is beyond the perspective of the actors themselves. Thus, in semantic interpretation, the focus, as already mentioned, is on the *how*, that describes how actors produce reality (Nohl, 2012, p. 44). In every step of the interpretation, the tertium comparationis (TC), that is, the *third* element structuring comparisons, is the common theme. It is called the *third* because the interpreter always determines the selection of the comparable topics from the given material and thus enters into the comparative analysis with her everyday knowledge or research interest (Kellermann, 2011, p. 28). During the interpretation of text types, orientation frames can be reconstructed by referring to separate sequences within a case using the TC (Nohl, 2013, p. 281). A homologous framework can be identified if it occurs in a first sequence, a second sequence (reaction), and a third sequence (ratification of the orienting framework) (Nohl, 2013, p. 281). These findings are explicated in terms of orientation frames in which topics are negotiated.

(iv) In order to reconstruct the regularity of the orientation frames that now have been elaborated, these must be continuously identified over a course of narrated actions by means of comparative sequence analysis across cases. They become evident and clearer when they can be distinguished from different orientation frames in other empirical cases, for example, when it can be contrasted with a different empirically given series of sequences in cross-case comparison (Nohl, 2013a, p. 282). Such comparative analysis, exploring the abstraction of orientation patterns, should be done early in the research process, because in this way the potential for

generalization can be distinguished from the case-specific distinctiveness (Bohnsack, 2013, p. 251). By comparing the respective case with other cases, it is possible to reconstruct in which way practices are integrated into current social-structural contexts (Meuser, 2013, p. 234). During cross-case comparison, analogous or homologous patterns were searched for in thematically comparable passages from different interviews, which may be communicated in completely different expressions (Bohnsack, 2013, p. 251). Due to the form of the problem-centered interview, it was plausible to use the topics marked out by the interview guideline as TC in order to interpret the respondents' framing of the topics and problems in a comparative way (Nohl, 2012, p. 50). The specific selectivity in the treatment of a topic, in other words the orientation framework, becomes only visible and conceptually explicable in the first place by holding a "horizon of comparison," or alternative interpretations, against it (Bohnsack, 2013, p. 252). This can also mean that certain orientation frames, certain ways of interpretation, do not appear in other interview passages on the TC. In order to work out the interrelationships between orientation frames, the TC must not change randomly but must be varied systematically (Nohl, 2012, p. 51).

(v) After identifying different orientation frames within one TC, the TC is no longer given by a comparable issue, but is now abstracted into the cross-case orientation frame or type. This type is made visible in its specific characteristics and therefore validated and specified in this way (Bohnsack, 2013, p. 253). The construction of a typology takes its starting point in a basic typology, which is given by the research interest of a project and its objectives (Bohnsack, 2013, p. 253). In this study, the basic typology consists of gillnet fishers of the German Baltic Sea, and the members belonging to this group have been contrasted with each other. After the TC was varied, a multidimensional typology emerged (Nohl, 2013b, p. 287). Thus, a milieu-type specification of the basic type is achieved (cf. chapter 5.1).

(vi) While the modus operandi refers to the sense-genetic interpretation, socio-genetic interpretation means the reconstruction of the *genesis* of the modus operandi. In the course of socio-genetic interpretation, key interactive scenes within the (collective) history of socialization and biography are sought. The access to such key scenes is opened by the focused passages in the narrative parts of interviews

(Bohnsack, 2013, p. 267). In the development of socio-genetic types, typified orientation frames are traced back to established social classifications such as gender, educational level, generation, distinct annual landing sequence, or organizational framed experience spaces, such as the occupational sphere of gillnet fishery. Due to the sampling of the fishers (cf. chapter 4.1.1.), there was no search strategy based on the established distinctions. The social classifications as well as the organizational experiences were very similar in the gillnet fishery, which made contrasting against such characteristics difficult and thus limited the development of socio-genetic types.

4.2 Expert workshop

The empirical collection of data was complemented with an expert workshop, which served as a further pillar to explore different management instruments to mitigate bycatch.

During a public project meeting of STELLA, at short notice the opportunity arose to ask the experts present for their opinions and perspectives on bycatch mitigation. Based on this, we as a project team prepared an expert workshop. Policy experts can be rather reluctant to take part in scientific projects, depending on how often they are asked to participate (Beyers et al., 2014, p. 184). So, in using the project meeting as a vehicle for the workshop we could assure a high compliance rate. The experts participated in the workshop following a detailed project presentation by all the working groups involved in the STELLA project. This workshop was held during the second year of the project, which on the one hand meant that the experts could already get insight into the ideas and research from the project, but on the other hand they did not have access to elaborated and finalized results.

An expert workshop quickly enables the collection of a relatively reliable opinion of a larger group (Zirius, 2013, p. 4). Since the evaluation of open group discussions is very time-consuming and this method is used primarily with the aim of exploring a yet unknown field and developing initial theses (Zirius, 2013, p. 4), we did not choose an open form of discussion for the expert workshop. Instead, a strongly pre-structured discussion form was used. During the meetings, both in the subgroups and in the large group, no consensus was demanded, but we aimed at a brainstorming as well as a critical discussion of ideas for bycatch mitigation and their feasibility.

The workshop was held with 19 experts, discussing potential management options that aimed at mitigating bycatch of seabirds and marine mammals and talking about problems that might prevent the implementation of such, leading to a set of suggested management options. The experts originated from the scientific Thuenen-Institute for Baltic Sea Fisheries (nine participants), the states' fisheries administration (seven participants), the Federal Agency for Nature Conservation (one participant), and environmental non-government organizations (two participants) (Barz et al., 2020, p. 3). Because the workshop was part of a public project meeting, the experts are classified as a convenience sample (Belton et al., 2019, p. 73). They were all known stakeholders in their field with professional experience in our research field and had membership in relevant institutions (Belton et al., 2019, p. 74). The participants of the workshop were divided into three different subgroups lead by a respective member of the project team. Since the members of the research team were present in the working groups, they were able to record the answers as well as answer follow-up questions and, if necessary, steer the discussion back on track. However, we as members of the research team did not participate in the discussions in terms of content. *The subgroups were asked to answer the same set of questions:*

(i) Which management instruments for mitigation of bycatch can you imagine for the gillnet fishery in the Baltic Sea?

(ii) How do you judge these instruments? What can be advantages, disadvantages, as well as administrative constraints?

(iii) Which management options do you deem most effective for mitigating bycatch?

(iv) What could be your specific contribution to realize successful mitigating instruments?

The subgroups later discussed their respective results in a plenary session. The results of the workshop were subsequently explored against the background of the characteristics of fishers' agency to consider potential reactions of distinct fisher types towards different management instruments in order to assess their effectiveness (Barz et al., 2020, p. 3).

"That we have to do something -
I also know that" [18]

(F7, Paragraph 150)

5 Case study: bycatch mitigation in gillnet fisheries

In the previous chapters, the research perspectives of praxeological approaches and environmental policy, complemented by the ecosystem approach in natural resource management, have been presented as well as the empirical method guiding this thesis. They serve the objectives of this study and are intended to provide information on empirical knowledge on the social fishing practices of gillnet fishers in the German Baltic Sea and their practices in relation to bycatch in particular. After unfolding different types of social fishing practices (cf. chapter 5.1.) and bycatch practices (cf. chapter 5.2.), theoretically classified management implications will be explored, which are underpinned by basic knowledge about how fishers act and about what possibilities other experts see (cf. chapter 5.3.). This chapter is concluded with input on any transformation potential that can be derived from the presented results (cf. chapter 5.3.3).

5.1 A Typology of fishers' agency

The reconstruction of orientation frames in the interviews can show that, independently of different changing conditions throughout the years, fishers have consistent dominating social fishing practices, because these are based on long-developed orientation frames. The analysis showed that the fishers cannot be neatly divided into different types—they tend to be of one type, but also apply practices that can be classified into another type. This shows that there is a continuum of different types of social fishing practices. In the course of the analysis, different orientation frameworks were elaborated, which subsequently merged into a complex typology that is described via the application of the concept of agency (cf. chapter 3.2.9). The analysis revealed three dominating types of agency: iterational, evaluative, and projective. In the following, different tertia comparationis (TC), which are categories with different

[18] "Dass wir irgendwas machen müssen, das weiß ich selber auch" (F7, Paragraph 150).

dimensions or properties (Nentwig-Gesemann, 2013, p. 309), are identified and are then condensed into a comprehensive typology of social fishing practices at the end of this chapter.

Due to the application of a problem-centered interview guideline, certain issues were raised by all fishers, which is accordingly reflected in the various TCs. Although the application of a guideline for the interviews provided foreseeable topics, due to the open questions, other TCs have also been developed. The TCs are described by means of typical examples, presenting the range of results.

In the text below, the provided quotes from interviews are translated into English. The original quotes are provided in the footnotes (short sequences) or in the appendix (long sequences).

5.1.1 Professional biography

Regarding the question about fishers' professional biography, a focus of the narratives on the causal explanation for career entry emerges. All of the interviewees provide a coherent account of how they became fishers. The social relationships within the family, as well as the self-location within a fishing family, proved to be central. In the process of individual case reconstruction and case comparison, two different plausibilities can be worked out, which are different forms of inherited occupations.

Inherited occupation I: "I fell into it"

To unfold the TC *inherited occupation I*, F12's professional entry was narrated and analyzed.

The interview with F12 can be summarized as follows: The interviewee is in his early 40s, has two children, and owns a house, which suggests financial stability. This is not the first time he has participated in a study with the Thuenen-Institute and he is open to the interview, which then lasts about 1.5 hours. Over the course of the interview, his career can be reconstructed chronologically: F12 has been fishing since he was a child, first with an inflatable vessel, then with a rowing boat, which his father bought him. He used to spend the whole summer vacation fishing together with his father. After school he went into a professional apprenticeship, so that he was allowed to go fishing officially. Since he fell out with his father, he then worked on other vessels in the North Sea, until he reconciled with his father and came back to the Baltic Sea. After that he again worked together with his father. They had two vessels, one of which they had ordered new. The father then retired and F12 kept only the smaller vessel for

fishing, because he can operate it alone and does not need an apprentice. Years later he bought a small fish trap vessel. He appreciates the independence of fishing as a self-employed person and he enjoys his profession.

At the beginning of the narrative, F12 immediately emphasizes his family bias, which he identifies as the primary cause of his entry into fishing. He cites early socialization into the profession as a plausibility and developed his own marketing strategies early on by selling his catches directly in the neighborhood. Overall, his entry into fishing is very coherent and logical to him. However, the narrative does not refer to an active decision, but to a *falling in* conditioned by the circumstances of his family history and opportunities at hand. This linear development is made possible by the support of his father, which is financial on the one hand and ideological/mental on the other.

> *Yes, well, that's a family affair, right. //hm// So my grandfather was already- and great-grandfather too, and everyone from my father's side, (.) as far as I can trace back, they all have always been fishing. //hm// So. And that's where I came in. So I (1) went out with a dinghy as a boy, @(very early)@. With a rubber dinghy and fished a few eel hooks. And then I always went off, and.(.) Here is a smokehouse with us, around the corner, (.) uh. fish hut NAME //hm// and then (1) I caught a flatfish from time to time, (.) with @(my ten)@ eel hooks, which I had there, or something. And then I went there with the one flatfish quite proudly under my arm. And then (.) I always had to sit down with the old man and eat a piece of cake. And then he was quite happy that I brought him the fish. @(.)@ Right, and every now and then I used to get 50 Pfennig or later a German Mark or so. (.) And then I was always totally excited [...] And uh, yes. Then it became more and more, ne. //ok.// At some point my father bought me a rowing vessel, then I had to row first. (1) Then my father always gave me limits, until then, (.) how far I was allowed to go. //@(.)@// The older I got, the further I was allowed to go. (.) At some point I got my first outboard engine. My father drove with me to Lübeck or so. There was a used one for sale somewhere. //hm// (1) Yes and °then° I started with nets at some point. (2) Then I already had, uh, (1) my fishing license, that you: uh: also use nets and and eel hooks and fish traps. You get that now automatically, (1) uh, if you do an apprenticeship in fishing. //mhm// And I did that before I ever learned fishing, (.) uh, I've been on such a.: Course and received an extra fishing license. So that I was allowed to fish. //Officially. Before that, everything I did there was unofficial. //@(.)@//*

Then the fish master and the water police always came and grumbled with me. @(Ne.)@ //@(.)@// @(was- was)@ (1) right, because I was fishing there as a young man. //hm// has my father sent me to this course, (.) And at that time you were still allowed to fish two gillnets. And that's what they drew away piece by piece. (1) Two gillnets, 100 hooks on a (.) long line, (1) And uh:, (.) four eel traps. (.) either four single or two double ones. //hm// So. And first they got rid of the gillnets, and now over the years they got rid of the eel hooks as well, now you are only allowed to fish with the fishing traps. With this fishing license. //hm// As a hobby. (.) Right. (2) Yes, and then I slipped into it, right. (1) Into fishing. ((Child and mother babble in the background, 2)) Family burdened. As a child I always had to go with my father anyway, (1) The summer vacations were always nice. (1) My father was happy to have (.) help. //hm// Everybody else was on the beach and I spent the whole six weeks on a vessel, right. //@(1)@// We mostly went to Denmark. On the last day of school- (2)

[...]

F12: Um. (1) Mostly on the last day of school already. My father had already made everything ready, //hm// and then we went up with a vessel, and then fished in the Kattegat up (1) from Læsø (1) for sole, //hm// (.) with gillnets, (1) and then I spent the whole summer there. On a vessel @(.)@ (1) @(In Denmark in the harbor. he)@ (1)Yes:. (1) And then right on time, when school started again, we were back. (.) That was my summer vacation. //@(.)@// (1) @(hura::)@(1) Yes. (1) I grew up with it, right. //hm// (.) Always went along, (.) They always took me along. (3)

Interviewer: And then came the real apprenticeship.

F12: Then came the real apprenticeship, yes. (.) Yes. (1) And then I did the apprenticeship. (2) And did everything there, right. (.) Sailor's patents, //hm// master craftsman's diploma, (2) And then (.) own vessel (2) Just like that, right. (2) And now you go fishing. //@(.)@/ @(.)@ (2) yes.

I: Could you tell me a little bit more about that? Since you started really, I say really? How did it develop then? Is it now still an inherited vessel, or: ~are you yourself:.

F12: ~No. I had:: with my father- I went for quite a while with my father, (1) So. And as is always the case with father and son, we got into each other's hair. So. And then we

ha- don't know.(.) almost two years not talked to each other. We just talked via my mother (.) So and during that time, I was on several vessels. But (2) So actually only on shrimp vessels. //mhm// I then looked at something completely different. (1) I've been here: uh: (.) with my father we had- He had a combined vessel with gillnets and trawls. //(1) And then I went to the North Sea, (1) I knew a lot of people from fishing school, (1) And one of them, where the deck man had a motorcycle accident and was urgently looking for someone, (1) and then I went with him. And then he was healthy again, and back again, and um: I already knew all of them, and then (1) I went onto another shrimp vessel.(.) until I got along with my father @(again)@ //@(.)@// Yes, and then I ended up here again. (2) Yes. (2) To check out something else, too. //hm// right.

I: And then here with your own vessel? Or again (.) with the father ~with.

F12: ~Yes, nee. My father had sold his and and- So for a while we had two vessels. My father had his and and I have a. //hm// a smaller one. (1) No, so we had one built, (1) And then (.) we went sometimes with the big one, sometimes with the small one, And and. (.) Yes. (1) So my father sold his later on and has stopped, and retired. So he asked if I wanted to keep the big one. But: I preferred to keep the small one.

I: The little one was the new one.

B: The newer one. //hm// Yes. (2) Yes, because- Well, the situation in fishing is: (.) not exactly rosy, (.) And (.) In the two years when I: wasn't with my father, the main problem was to find someone to take along. //So, in that time I think he [the father] had five or six people in the two years. Because they simply (.) If there was good fishing, (.) and good money to be earned, (.) then that's the way it is. Then you cannot stay for birthdays, and on public holidays and who knows what. Since you have to go when the weather is good, //hm// and then you must go. And then - now there is fish, (.) and now we have to hit them. Now it has to go into gear. (F12, Paragraph 2 - 15)[19]

[19] For the original transcript cf. App. D

F12 begins his narrative with the assessment that being in the fishing business is a *family affair*, which he later on refers to as a *family burden* as well. This rhetorical element prepares the ground for his further depiction. He considers how his entry into the fishery can be explained by him and can be made plausible for the interviewer. F12 then elaborates on the *family affair* by further explaining the *family* part and disclosing that at least his grandpa, great-grandpa, and all relatives on his father's side, as far as he can trace them back, were fishers. The reason he is in fishing is that *they all have always been fishing* and *that's where I came in*. Thus, he does not describe his career choice as accidental or his own choice. He is the next link in a long tradition and it is not yet clear whether this really burdens him or if the wording is only meant to express the strong family imprint. By referring to his past relatives, he describes fishing as a patriarchally inherited profession, which will be the dominating orientation during the narrative of his entry into fishing. The profession, which has been practiced over generations, shows a high degree of occupational inheritance and reproduction of occupational status in F12's family fishery, but only in a patriarchal way. The mother's profession—which, especially in the past, often entailed helping fishers work on land—is not mentioned as influential.

Although F12 seems to end his logic for why he got into fishing with explaining his family history, he then goes on to tell in detail how the practice of fishing has accompanied him since childhood. F12 started fishing *very early* as a boy, with an inflatable vessel and a few eel hooks, apparently alone. He talks proudly in detail about what happened to the fish he caught and narrates a professional routine-like procedure of selling his fish. This routine does actually not differ from the routine of a professional fisher: deciding to go fishing, deciding on gear, catching fish, establishing a direct marketing strategy, and earning revenue. He continues to describe the increase of his possibilities and his activities in a growth trajectory-like manner: the inflatable vessel was replaced by a rowing vessel, which was later equipped with his first outboard engine. His father plays an important role in the development of his fishing practice: on the one hand he enables the fishing of his son, on the other hand he sets limits on where his son is allowed to fish and therefore limits the choices of his son. The enabling of fishing for his son is characteristic of occupational inheritance, which is most common in the artisanal milieu. It is mainly associated with and explained by the transmission of the means of production necessary for the practice of the occupation from father to son (Daheim, 1994, p. 92)—as can be seen in the procurement of fishing equipment by the father. The purchase of the outboard engine also marks the start of F12's legal fishing practice: he obtains his fishing

license, which is needed for recreational fishing. All fishing activities before the acquisition of a fishing license were therefore illegal, but are not narrated as deviant practices, although he was caught several times by the fishing master in the harbor or the water police at sea. The deviant behavior is not described as a counter narrative or a story deviating from the norm, but appears coherent and plausible. Since he does not report any other consequences, except that his father sent him to a course so that the son could legalize his fishing practice, it can be assumed that the controlling instances also did not classify the behavior as prosecutable. As shown in chapter 2.1.1, compliance in fishery is an often-discussed topic. After elaborating on obtaining his license, F12 closes this narrative as he began it, referring once again to the *family burden* that brought him to fishing. He draws an interim conclusion for himself and underscores fishing as a not actively chosen profession by stating *I fell into it*. The family burden is also found in the phrase *I had to go with my father*. He describes his summer vacation as atypical for his peer group. While other school children had their summer vacations, F12 went fishing with his father for the entire time of the vacation. At the same time, however, he describes this time as *nice* and keeps on narrating his summer vacations as something that could compare to an adventure: they left on the very last day of school, fished in Denmark, where he then spent his summer, and did not return until the start of the new school year. This again reflects the ambivalence already described above: on the one hand, he speaks of a family burden and, on the other hand, he shows enthusiasm on a discursive level for the fishing experiences in his childhood and youth. However, he does not explain this ambivalence discursively. During this time, his father provided him with career-related experiences and thus fostered his fishing-related skills. Ambivalence continues to appear in various phrases such as *I went along* versus *they took me along*. On the one hand, he describes an active decision, yet on the other hand, it becomes clear through his narration that he probably had no choice and was taken along. This ambivalence as well as the connection of his entry into fishing to his father shape his narrative at the beginning of the interview. The longitude and density of the narrative shows how relevant these experiences of non-professional fishing practice are for him, whereas in the following sequences, where he talks about his professional fishing practice, he keeps the narrative rather short. This shows how much more weight he puts on his upbringing and family traditions when it comes to fishing and how little influence fishing school and apprenticeship have in comparison. F12 describes this section briefly by listing his degrees as well as reporting on the first vessels he owned as

a professional fisher—these are the markers that make him a *real* fisher. By listing his degrees, he achieves professionalization and legitimacy for his fishing practice. It is apparent that his father continues to become the guiding principle of his narrative during his time as a professional fisher as well. The relationship to his father determines the narrative structure of his career as a fisher. After his exams, he started fishing with his father and only stopped when they had fights, which resulted in them not talking to each other for two years. At this point in his narrative it is the first time he references his mother—she now has to mediate and communicate in the conflicted dyadic relationship between father and son. The fight with his father serves as a plausibility for why he left for the North Sea, where contacts from fishing school secured him further jobs. His career continues in a trajectory matter—not remaining static in the family business, but moving forward *to check out something else*. However, he did not *check out something else* for an end in itself or to expand his horizons, but through the impulse set by the quarrel with his father. This is also exactly how the process of exploration ended—when the quarrel with the father ended, he resumed fishing with him. The professional relationship with his father only ends when the father retires. It is not clear how long ago the father retired, but during the interview, the impression was that it was quite some years ago. Nevertheless, the narrative about F12's career in fishing at this point also ends with his father's retirement. He continues with another topic and goes into detail as to why he decided to fish with a small vessel to be independent. F12 often generalizes statements by using the phrase *always*. This suggests a certain perceived stringency. Things have always been this way; therefore, certain actions have grown out of them.

The dominating guiding principle in F12's fishing career is the inherited occupation, documented in the relationship with the father, who mostly decided, directly and indirectly, over when and where the son gained experiences as a fisher. He also enabled the trajectory logical progress in F12's fishing practice, starting as a little boy who depended on others to fish and ending as a licensed and independent fisher who gained different experiences. F12 learns the rules of fishing from his father in terms of normative elements that specify permissible behavior (Giddens, 1984, p. 30) as it contrasts with the illegal fishing that F12 practiced before he obtained his fishing license. He documented that the normalizing and trivializing of the practice based on tacit knowledge lead to a reproduction of this social practice over a longer period of time—until he obtained his legal fishing license.

In another case, F18 describes how his father, another fisher, decided for him that he would not become a fisher at first.

> *"Yes, I was born (2) as,- well, my name is- Do you need it? //mm(negative)// (.) Yes, I was born as a fisher's son. (1) My father has always been a fisher (.) always yes, (.) at the moment he is still a pensioner, (1) Um, and: (1) then (.) I also wanted to become a fisher, but (.) my- I also have a brother, who is also a fisher @(.)@, he beat me to it and then (.) my father didn't think it was so good that two sons (1) become the successor. (1) And: (.) I learned another profession. (1) But then, a few years later, I trained to become a fisher at my brother's. (1) And then also (.) for a while later, seized self-employment."* (F18, Paragraph 11)[20]

At this point, the orientation of the narration towards the father and his life as a *fisher's son* is documented. F18 goes on to describe what his father used to do and what he does today. He sees this as determining his career path. The father has further influence because he opposes F18 becoming a fisher since his brother is already a fisher. His reservations are based on the fact that he does not want to have two successors for his business. F18 bows to his father's objection and carries out another apprenticeship. Nevertheless, he later finds his way into fishing after all, as he had always wanted. Although F18's and F12's paths into fishing are shaped on the one hand by a conflict with the father and on the other hand by a supporting father, both nevertheless orient their narratives strongly towards what their fathers did and what they allowed them to do or not do. It can be seen that the influence of fathers in fishing can be constraining and enabling as well.

Inherited occupation II: "Fishing is out of the question for me"

Whereas we examined F12's entry into fishing, which was structured through an early and active socialization through his father, which has led him incrementally further into fishing, F4's entry into fishing is now presented in detail. He represents a group of fishers who first had a different occupation because they did not wish to become fishers after school and only got into professional fishing later in their lives. F4 wanted to talk immediately about bycatch

[20] „Ja. Geboren (2) wurde ich als, also mein Name is- Brauchen Sie den? //mm(verneinend)// (.) Ja, geboren wurd ich als Fischersohn. (1) Mein Vater is also auch schon Fischer (.) immer ja, (.) Moment noch Rentner, (1) Ähm, und: (1) dann (.) wollt ich auch Fischer werden, aber (.) mein- Ich hab noch ein Bruder, der is auch Fischer @(.)@, der kam mir zuvor und dann (.) fand mein Vater das nicht so gut, dass zwei Söhne (1) den der Nachfolger praktisch werden. (1) Und: (.) hab ich n anderen Beruf noch erlernt. (1) U=dann doch n paar Jahre später, hab ich bei meim Bruder dann die Ausbildung gemacht zum Fischer. (1) Und dann auch (.) ne Zeit lang sch- später äh die Selbstständigkeit ergriffen." (F18, Paragraph 11)

and after it was explained how the interview was built up and that the first question asked about his fishing experience, he directly started talking about his entry into fishing, without leaving time for the narrative stimulus to be expressed or the recording to be turned on in time. For this reason, the recording only starts with his second sentence—the first sentence was noted in the protocol after the interview, and he stated that he got his vessel from his father, who is also a fisher.

In contrast to Inherited Occupation I, described above, this dimension includes cases where fishers entered professional fishing later in their professional lives. Within the framework of active decision-making processes and evaluation processes, the fishers found their way into fishing only after deliberation. Afterwards, staying in the fishery was usually triggered by a key experience, documenting that it had not previously been decided whether these fishers would actually keep working in the fishery. For clarity, F4 is presented in more detail and then the TC is filled in with other case studies.

> *Interviewer: "Keep on going – you took over the vessel from your dad..."*
>
> *F4: "Yes, and I know it from my father, I also fished with my father at that time, and also the first years when I was self-employed, we fished in the winter, and there was no bad weather, we just fished. I mean, not everyone did it that way, but I did, we did it - that way back then, we made our sales in the winter, and then we had to see what the rest of the year would bring. //hm// [...] yes. I am, (.) as I said, uh, my father is a fisher it is not my (.) my real father, we are originally from LOCATION A, (.) and. uh. my, my real father is (.) very early deceased. (.) and my mother had (.) here in LOCATION B, there, you already had contact with NAME 1, that is my //@(yes:)@// my adoptive father practically. [...] well, so um: I was then (2) °I was then°, five, six years when my father died and, um (.) they have then just met. my mother and NAME 1 and, then we are, (.) also relatively quickly, moved to LOCATION B. (.) yes, and then we were in the fishing business, right. and (.) after school (.) at first, it was clear to me that I: (.) did not want to do that. right. I saw my father always work - day and night and no: (.) and so for me, I was certain, as I was 16 years old, (.) that there is also something else [than fishing – FB] @(.)@ well and then I somehow ... (2) my God when was that. YEAR A? YEAR A, yes. YEAR A my brother died. (2) and then I somehow: (.) came on board with him [my father]. (.) At that time I probably also (.) didn't have work, was young and*

also had somehow -, (.) n (.) well I don't have to spell it out, probably - I also had other things on my mind, right? (.) Well, and then it was actually clear to me on=the first day- where I always said, fishing is out of the question for me - on the first day it was clear to me that:, I have to do that. because that's what I want. right, (.) and, so I came into fishing. And then I at some point went to LOCATION C and have worked on a larger vessel as a deck hand with NAME 2 (2) and, did that for seven, eight years. (.) And then I: a:ls (.) career changer, (.) must I um=um, had to get this fishing license; I had to learn a nautical profession, //hm// (.) I did that as a career changer, um, my fisheries exam, (.) and the year after my (.) certificate, (.) and then my father handed over his ship to me. (.) no, (.) that was (2) yes, that was...(.) he fishes with, he still fishes, //hm//he is: °I think he's 60 something?°(.) and of course he can't let go. and that, so I am saying today (2) um, this vessel that: that was his life's work right, it really was. (.) He (.) he gave me the prospect back then, get your license, get your sailor's patent, and then you'll get it. You'll get the vessel. But I think he would have been happy to hand it over five or six years later, (.) yes, and that was at the end of YEAR 2, (.) and since then I've been self-employed. (.) Here in LOCATION C in a cooperative. My father was in LOCATION D, in the cooperative, he fished from LOCATION B but (.) was in LOCATION D in the cooperative but because I lived here, //hm// there was actually no (.) no alternative for me like LOCATION C ne, (2) and I think that was also the right way. //LOCATION B is, after all, like this self-marketing, which we have to do, otherwise it doesn't work anymore, (.) here are more (.) more people and (.) more potential buyers, like in LOCATION B, //ok// (2) jo. (2) Yes and since then (2) we have to deal with it. @(.)@ //@(.)@// but I like to get angry [about it]."

Interviewer: "@(is alright)@. and did you do anything else in between school and ~then the. fishing story?"

F4: ~yes I did something else for 14 years //hm// yes. and then came fishing. (4)"[21]

(F4, Paragraph 1-20)

[21] For original transcript cf. App. E

F4 emphasizes the professional relationship with his father right at the beginning. He continued to fish with his father when he was already self-employed—neither of them worked as an employee for the other. This documents a strong interest in independence on a professional level of fishers. At the same time, the joint fishing experience demonstrates a certain dependence, be it labor-related (because the vessel cannot be managed alone) or ideological (e.g., because the son wants to continue to benefit from the father's experience). The relational level is further extended by the reference to working together in winter under harsh conditions. By differentiating that *not everyone did it that way, but I did, we did it*, F4 and his father distinguish themselves from other fishers by their hard work in winter and their willingness to do it. After this narrative reinforces the image of a duo sticking together, F4 differentiates this image by emphasizing that his father is not his *real father* but his adoptive father. After his *real father* died at an early age, his mother met his adoptive father and the family changed residence to move in with him. For F4, this is the moment when he and his mother arrived in the fishing business. Although he does not report whether and to what extent he was already involved in this business as a child, this marks for him the moment that brought him into fishing. He then indicates a turning point and separates himself from fishing when he sees the opportunity to do so after graduating from school. It was *clear* to him, that he did not want to be in the fishing business, since he saw his father work very hard (*day and night*), which was not for him at the age of 16. He is separating himself from his 16-year-old self, while at the beginning it was important to him to emphasize that he is able to do the hard work (unlike some other fishers), the exact same hard work that kept him away from fishing when he was a teenager. Here a clear contrast to F12 emerges, whose course can be described as continuingly increasing, while in F4's case a decision-making process can be traced, which did not let him pursue a goal from the beginning, but provides for current considerations and re-evaluations. This also becomes clear later on, when F4 tells how he found his way into fishing after all. He explains quite loosely that his brother died and then he ended up on his father's vessel. He himself does not seem to be sure how this happened: *I somehow came on board with my father*. Nevertheless, the death of his brother brought a crisis to his life that made him consider things, such as his career choice. He is presenting opportunistic motives as well, because he suggests that he was unemployed at that time and *had other things on my mind*. He evaluated his opportunities at hand, as well as his current status and *somehow* decided to go fishing with his father as a lateral entrant into that occupation. He was still not

convinced, before he first came onto a vessel, that this was the right choice, but on his first day of work, he describes a key experience: *On the first day it was clear to me that, I have to do that. because that's what I want. Right.* From now on, his narrative is again closely related to his father, where he previously made efforts to get away from the father on a professional level. Only with the realization that *that's what I want* he also strives for the professionalization of the occupation. He sees himself as a lateral entrant, although he marked the connection to the fishing business early in his biography. Here, again, a back and forth of interpretations in his professional biography can be seen: at times he sees and saw himself as part of the fishing business, sometimes he distanced himself from it. There was a recurring re-evaluation of the situation. After his key experience, however, the evaluative process seems to settle down, as he then seeks a fishing license later. At this point, similar to F12, a proximity of the development of professionalization and paternal influence or favoritism can be seen. However, F4's father provides a clear incentive: should his son pass the fishing exam and receive a license, he can obtain his father's vessel. Yet F12's father showed him the way out of the illegality of fishing, but did not motivate him with any kind of reward. It seems like F4's father found it necessary to present an effective incentive, since he might have found it difficult to hand over the vessel to F4 at that time. The following descriptions in F4's narrative is strongly related to different places. He documents a distancing from his father again at this point by emphasizing that he has chosen another location than his father's, where his vessel is located, where he belongs to a cooperative and also where he sells his catch. He brings up the proximity to his home on the one hand, as well as economic reasons, since improved self-marketing is possible due to it being an interesting location for tourists in location C. Although he sees the necessity of marketing to walk-in customers, he perceives it as a burden, which is expressed as: *We have to deal with it, but I like to get angry about it*. At this point, his laughter puts into perspective the strong statement that this kind of marketing makes him angry. Only when asked by the interviewer does it become clear that F4 entered the fishing industry after 14 years in another profession.

In this dimension, as represented by F4, entry into fishing has been accompanied by a planned decision to go into fishing. Prior to entry, there was a period of consideration, usually accompanied by the exercise of another profession. The change to fishing then occurred for different reasons: while in F4's case it was a personal shock experience in the family (*YEAR A my brother died*) accompanied by personal unemployment (*At that time I probably also (.)*

didn't have work) that brought about the transformation, in F9's case the social interaction in his old profession is documented as an important factor. F9 draws a picture of a brotherhood among the fishers who are on friendly terms, and he wanted to be part of this.

> *"I started with trawling. I had another profession at that time, //hm// [...] and because- all that doesn't shock //@(.)@// (2) yes the work was good but just (.) eh (2) the people were crap. (2) you were treated like the last dirt //hm// you, that is not for me. And within the fishery you were treated like a buddy. Not like workers, but like buddies. //hm// They were better. That was when I went on my first trip to Bornholm. It was in May or June, I think, I can't remember now. And I liked it so much that I stayed in fishing. I did my license and it's good."* (F9, Paragraph 6)[22]

He also had a key experience that manifested the decision to go into fishing professionally, in the form of his first fishing trip. However, before it even becomes clear that F9 once pursued a different passion, he makes his entry into fishing plausible as the change from hobby to profession, presenting another reason to go into fishing besides the assumed brotherhood of fishers:

> *"~So I turned my profession into a hobby. Ehm, my hobby into my profession, that way round //yes//. I liked fishing when I was a child, (2) and that's why I came to fishing, because I thought it was great"* (F9, Paragraph 2)[23]

<u>Patriarchal inherited occupation</u>

Both described dimensions document a close professional relationship to the fathers, who are also fishers. The narratives, which are organized around the role of the father, blur the placement of the father in the private or professional sphere. The association of fathers and sons in fisheries is favored by the structural features of fishery policy. In Germany, quotas for fishing are tied to vessels. This means that only by acquiring a vessel can a quota also be

[22] „Ich hab mit Schlepp-äh-netzfischerei angefangen. Ich hab damals n andern Beruf gehabt, //hm// […] und denn- das schockt alles nicht //@(.)@// (2) ja die Arbeit war gut aber eben (.) eh (2) die Leute waren Mist. (2) wurst behandelt wie der letzte Dreck //hm// weist=das=is=nix. Und inner Fischerei wurst wien Kumpel behandelt. Nicht wien Arbeiter sondern wie wien Kumpel. //hm// die kam eim besser. Da fuhr ich damals erste Fahrt wurd ich gleich weiter nach Bornholm hin. War im Mai oder Juni, glaub ich, weiß ich gar nicht mehr jetzt. Und das gefiel mir so gut, denn bin ich in der Fischerei geblieben. Hab ich gelernt und is gut.“ (F9, Paragraph 6)

[23] „Also ich hab meinen Beruf zum Hobby gemacht. Also ähm mein Hobby zum Beruf gemacht anersrum //ja//. ich hab als Kind gerne geangelt, (2) und deswegen bin ich Fischerei gekommen weil das toll fand“ (F9, Paragraph 2)

acquired. Newcomers to fishing can acquire a quota from the ministry and have to buy a vessel. For most young professionals this means that they have to take out a loan to start their own business. At the same time, banks are very skeptical and severely restrict loans to fishers, influenced mainly by the restriction of quotas and overfishing. As a result, it is easier for young fishers to start a business if they inherit it from their fathers without any initial costs. Allocative resources thus strongly influence entry into the fishery and are an integral part of the occupation inheritance. They enable young fishers to go fishing, be self-employed, and start with little or no loans. At the same time, they also restrict the possibilities of fishing, depending, for example, on a certain gear or range of the vessel. Material resources in terms of working equipment and authoritative resources in terms of knowledge about the organization of work and life chances are easily accessible to fishers who come in touch with fisheries early in their life, even if to a different degree of intensity. While F12 had a long, constant, and time-intensive relationship with fishery, F4 got in touch with it, but decided to move away from it before coming back to it, firstly only physically but then also mentally, when he decided that fishing was all he wanted to do from then onward. Both fisher types point out that they come from a long line of fishers, suggesting that bequeathing of resources has already occurred over several generations and has led to an institutionalization of bequeathing practices. This can be documented in almost all cases:

> *"Yes, through my parents. So, my father was already a fisher, right //hm// and then my grandpa and the whole family, //hm// So...the choice was not far off that one then also does it. Then I also became a fisher."* (F6, Paragraph 13)[24]

F6 also explains his entry into fishing with the family tradition. He documents that for him it is a logical step to become a fisher, a logical choice, but speaks of a choice nonetheless. While F12 already spoke of a *family burden*, F6 also documents that his perspectives were limited and so he became a fisher. It becomes clear in this citation why Giddens, in recourse to Émile Durkheim, understands socialization as a processual constraint, where the life cycles of children and their parents are connected in a mutual time process (Giddens, 1984, p. 170). Fishing was something that F6 has been familiarized with and therefore *the choice was not far off* for himself to also become a fisher. Family influence, and possibly family pressure, thus

[24] „Ja durch Eltern. Also mein Vater war schon Fischer ne, //hm// und dann eben mein Opa und ganze Familie, //hm// Also. Viel, viel die wahl ja nicht weit, dad man dad dann auch macht. ne, so. Dann bin ich auch Fischer geworden“ (F6, Paragraph 13)

limits the fisher's freedom of choice. Continuing in Giddens' train of thought, the family influence in fishing cannot only be constraining, but must also be enabling. As mentioned before, fishers inherit different forms of resources and knowledge when being socialized in a fishing family. Whereas F18 shows that it seemed difficult for his father to have two sons to hand over the business to, analysis of the other interviews revealed that current fishers assume that they will be the last fisher in their family's fishing tradition. They validate their plausibility by stating that they would not recommend a fishing career to their children because of the development in the fisheries industry or by explaining that the children have already found other professions. Research on occupational inheritance has shown that family plays a central role in the transmission of status. Here, a clear homology is traced between the fathers' and the sons' career choices, as can also be demonstrated for other professions (e.g., teachers) (Rothland et al., 2015). Social status and prestige are passed on to the next generation through membership of a specific occupational field (Hense & Schad, p. 2). Parents have a key role in the career choice process, as they convey (career-) knowledge, beliefs, and values as active role models in working life (Rothland et al., 2015, p. 130).

5.1.2 Attitude towards fishing and fishing gear

During the interviews, the fishers provided information on how they rationalize their social fishing practice in general and, in particular, the reasons for practicing gillnet fishing. This is elicited by the question about their attitude towards alternative fishing gear, which ideally would avoid bycatch, such as fish traps or modified nets, as developed in the STELLA project (Chladek et al., 2021; Kratzer, 2021). This chapter thus raises the question of the rationale for action in the gillnet fishery and its reasons for engaging in a specific course of action. Although the reasons do not necessarily have to be elaborated discursively, competent actors expect from each other that this is possible when requested (Giddens, 1984, p. 6). Thus, it becomes apparent in the interviews that knowledge about reasons can be made accessible through the formulating interpretation and deriving of orientation frames. In the first section, fishers' attitudes towards their profession in general are discussed and their orientation frames are explained. Subsequently, these explanations will be supplemented by the attitudes and opinions towards gillnets and other gears, respectively. Finally, profession-specific challenges, as well as on the orientation frames in which these challenges are dealt with, are discussed.

Attitude towards fishing

The enjoyment of the profession implies that fishers enjoy being with nature and the freedom they ascribe to it, which are two factors that function as action guiding. Emphasizing the values of fun and freedom distances fishing from other notions of gainful employment, where the purpose of earning money dominates.

> *"@best job there is@. You go out in the morning, one goes to sea with joy! [...] you see nature, of course there are also days where you say uaar, jellyfish or=what=kind=of=crap but, normally it's like, (3) ehh (.) like freedom right. In the past that was definitely the case. //hm// Now I can no longer do anything else because I'm already too old. You're approaching 50 and then you can't do anything else anymore. But it used to be normal, you'd drive off, you didn't have all the paperwork here (.) but what else do you want to do? (2) A few times I thought, stop all this crap, but what do you want to do? (2) Because this job is really fun."* (F9, Paragraph 39-43)[25]

In this section, F9 presents various ambiguities. While on the one hand he confirms that fishing is the best job in the world in his eyes, closely coupled to *nature*, he immediately puts this impression into perspective with jellyfish, which are *crap* in his nets. This is followed, however, by another positive aspect (*freedom*), which is subsequently put into perspective again by the counter-horizon of *before*, when the fishers were free. He thus serves classical images of freedom at sea, which, however, used to be associated more with sailors (Kube, 2013, p. 14) who travelled long distances and not with coastal fishers. Towards the end of the quote, however, he blames *paperwork* for his lack of freedom and thus blames the regulations that require paperwork. On the one hand, he then plays with the idea of leaving fishing, but immediately rules this out because he is *too old* for it and he *really* enjoys the profession. Although considerations are implied at this point, however, F9 remains in his profession despite his ambiguities, documenting a practical-evaluative agency in this dimension. The orientation towards what intrinsically satisfies him and what he enjoys is in the foreground

[25] „@beste Job den s überhaupt@ gibt. du fährst morgens raus, man fährt mit Freude auf See! […] du siehst die Natur, klar es gibt auch Tage wo sagst uaar, Feuerquallen oder=was=ich=alles fürn Mist aber, normal is das so, (3) ehh (.) wie Freiheit ne also. früher wars auf jeden Fall so. //hm// jetzt kann ich ja nichts mehr anderes machen weil ich schon zu alt bin. gehst auf die 50 zu denn denn geht das irgwann nich mehr, kannst nix anderes mehr machen, aber normal war früher so, du fuhrst los, hast den ganzen Papierkram nicht gehabt hier (.) aber was willst anneres machen? (2) büschen paarmal gedacht, hörst auf mit dem ganzen Mist, aber was willst machen? (2) weils richtig Spaß macht dieser Beruf" (F9, Paragraph 39-43)

and serves as actions guiding an orientation frame. Bureaucracy and jellyfish (and, consequently, management and ecological factors) are addressed as challenges, but they are not in the foreground and serve only to put the previously expressed positive aspects of fishing into perspective, documenting a constant evaluation process. The action rationalization of freedom is also elaborated on in the following quote:

> *"Yes, you are independent, right. You can do what you want, so you can get up whenever you want, you can head out. Well, you're also a bit tied, you have to bring in money. Otherwise the business isn't worth it. (.) Otherwise it's a nice job. =You're here then: pf. Yes. (.) How should I say. (2) A few colleagues are there, then you chat with them:=and so yes. (.) So that is already quite good. You don't have a boss and nothing. //hm// (2) That's just fine. (.) In the morning when the sun rises and the weather is still nice, you can have a nice view."* (F6, Paragraph 50)[26]

Freedom is again explicated here as a freedom from fixed requirements, as can be found in the case of any solo self-employed person. But like F9, F6 also relativizes at this point with the reference to the fact that it is nevertheless a matter of profitable work, which must also bring revenue (*you have to bring in money*). He then immediately names the advantages of his work, which for him can also be found on the social level. On the social level, he can choose with whom he has contact and evaluates the chat with colleagues as positive, just like the fact that he has no superior. However, the freedom from superiors (and also employees) means at the same time a lower level of accountability (and responsibility). He closes his statement with an observation of nature, which his job allows him to make, and thus paints a romantic picture of fishing. This attachment to nature is also made explicit in other cases.

> *"I think that is underestimated with the fisher. The fisher is not only one, who takes out the [fish] //hm// We enjoy, we really enjoy the nature. //hm// We have a connection to this nature, and (1) that is also a reason why we head out. //hm// It's just the love of nature. //hm// That's what we need. And that's why- (.) It's completely contradictory, if we take everything out, destroy everything and so on. Yes, if there is*

[26] „Ja bist selbstständig ne. Kannste machen was du willst, also kannst aufstehen:=wann du willst, du kannst rausfahrn. Naja, n bisschen gebunden biste auch ne, du musst ja Geld reinbring. //hm// Sonst lohnt sich das Geschäft ja nich ne. (.) Ansonsten pf is ja n schönes Arbeiten.=Bist=j=hier dann: pf. Ja. (.) Wie soll ich sagen. (2) N paar Kollegen noch da, dann quatscht man mit den:=und so ja. (.) So is das schon ganz gut. Hast kein Vorgesetzten und nichts. //hm// (2) So is das völlig in Ordnung. (.) Morgens wenn die Sonne aufgeht, noch schönes Wetter is ne, kannste schön gucken." (F6, Paragraph 50)

> *nothing left, I don't need to go there anymore. That's what life is all about. I have ringed seagulls, I recognize them. //hm// I've had a seagull for years, I also gave it a name. And it sits on the net winch and eats out of my hand. And she prefers to eat only liver. //@(.)@// The (.) she refuses the other stuff, and. (.) Yes, that is almost my buddy, I say //hm// right. No one else there. And. The others are just seagulls, right. @(one, but)@. This seagull (.)"* (F18, Paragraph 76)[27]

In his narrative, F18 resists an image of fishers that he assumes is brought to him from the outside. He discursively justifies his actions with his love of nature and in turn takes this as a plausibility for the fact that fishers do not *destroy everything*. F18 underlines his close connection to nature with a detailed description of his seagull (*I've had a seagull for years*) which he describes as a domesticated pet.

In general, these orientation frames serve romantic and also stereotypical images of fishing, of people acting independently and freely at sea, in close connection with nature, but also always experiencing obstacles and working hard to overcome them. The image of the *hunter* (e.g., F3, Paragraph 55) is also drawn several times. Because of the repeated reference to the positive aspects of fishing that frame the narratives, the relativizations that the fishers interject lose weight. It becomes clear that when these constraints have played a role in evaluative processes, however, they have been discarded in favor of familiar patterns of action, in this case maintaining fishing in the current mode. However, it is also clear that the freedom from responsibility and fishers fishing alone is not always intentional, but structurally conditioned by low quotas. Furthermore, the fishers also construct nature, the weather in particular, as a constraining factor for their independence. Fishers also repeatedly address social contacts as part of their social fishing practice. On the one hand, social contacts are described in the sense of encounters to socialize with colleagues and customers and on the other hand (F18), social contacts are described in the orientation framework of competition

[27] „Ich glaub das wird wird unterschätzt beim Fischer. Der der Fischer ist nicht nur Eine:r, der der das rausholt. //hm// Wir wir genießen, wir genießen auch wirklich die Natur, //hm// Wir wir haben schon eine Verbundenheit zu dieser Natur, und und (1) Das das is auch ein Grund, warum wir rausfahren. //hm// Das is einfach die Liebe zur Natur. //hm// Das brauchen wir. Und deswegen- (.) Es ist ja völlig widersprüchlich, wenn wir alles rausholen, alles vernichten und so weiter. Ja, wenn da nichts mehr is, brauch ich da auch nicht mehr hinfahrn. Das das macht das Leben ja aus. Ich freu mich ja f- Ich hab beringte Möwen, die erkenn ich. //hm// Ich hab seit Jahren eine Möwe, die hat auch von mir n Namen bekommen. Und die setzt sich auf die Netzwinde und die frisst mir aus der Hand. Und am liebsten frisst sie nur Leber. //@(.)@// Die (.) die verweigert das andere, und. (.) Ja, das is is schon fast mein Kumpel, sag ich mal //hm// (aus so hier?, ne. Is ja sonst keiner da. Und. Die anderen sind eben nur Möwen, ne. @(1, aber)@. Diese Möwe, (.)“ (F18, Paragraph 76)

(F4). However, both forms of contacts are constructed mostly positively and contribute to positive framing of work practices.

> *"That is- Yes, that is definitely (3). Most of all, I really like (2) the- that is really the best, - the fishing is almost passive - the contact with the people. //hm// (2) The sale at the pier, at that the moment it's not at all about the money, that's a pleasant side effect. It's simply the contact. I get to know a lot of people, (.) It also has a disadvantage, (.) when these people leave life, (1) It's stupid, you knew them all well and //hm// yes. But you really get to know each other- (.) That: like a little corner store, you get to know each other personally. //hm [...] It's not just about fishing, and, did you catch some fish? Yes, I did. There are also people who don't seem to be able- or they believe that a fisher is just a fisher, //hm// who goes out with his vessel, lights a pipe, //@(.)@// and then he is the happiest on the whole planet. //hm// No, he's not. It's just a workplace ult- ultimately, ne. At sea, I do the work. //hm//"* (F18, Paragraph 51)[28]

F18 describes the interaction with people during direct sales as the *best* thing about fishing and places these social contacts, which he cannot have at sea, above the economic value of this action. In his eyes, these contacts are very personal, which he romanticizes by referring to the *corner store*. A corner store in a village is a familiar place with a vital role in the neighborhood, where people know each other and meet to socialize, not only to shop (Logemann, 2013, p. 155). The counter horizon to this is formed by people who are only interested in buying fish and who thus imply that he is only interested in the monetary value of the transaction, but not in the social contact.

> *"and that is the incentive right, if I: have worked a lot, and- then I have usually also earned a bit (.) and (.) and somewhere also this competitive thinking right, d, n, (2) to be better than the others, and, that:, that is simply the charm, right, (2) in any case. (2)*

[28] „Das is- Ja, das is auf jeden Fall (3). Am liebsten hab ich tatsächlich (2) den- das is da wirklich das das das beste, das hat- der Fischerei is ja passiv fast, der Umgang mit den Menschen. //hm// (2) Der Verkauf am am Steg, das geht m in dem Moment gar nicht um das Geld, das n: angenehmer Nebeneffekt. Das einfach der Umgang. Ich lerne unheimlich viele Menschen kennen, (.) Hat auch wieder Nachteil, (.) wenn diese Leute aussteigen aus m Leben, (1) Es is blöd, du kanntest die alle gut und //hm// ja. Aber man lernt sich wirklich- (.) Das: wie so n kleiner Tante-Emma-Laden, man lernt sich persönlich kennen, //hm […] Es geht nicht nur ums Fischen, und, jou häst du Fisch fung? Jou, hab ich. Solche gibt es auch, die die könn scheinbar nicht äh, oder oder glauben der Fischer is einfach nur Fischer, //hm// der fährt mit seinem Kutter raus, zündet sich ne Pfeife an, //@(.)@// und dann is er der Glücklichste auf m ganzen Planeten. //hm// Nein, is er nicht. Es ist nur n Arbeitsplatz let- letztendlich, ne. Auf See mach ich die Arbeit. //hm//“ (F18, Paragraph 51)

> *Well clearly there is some peering, //hm// right (2) but right: f (.) Yes f(2) that: that is then also s- (2) one says always (3) so there is no fisher, who doesn't grudge his colleagues (.) there is simply no such thing, even if you always- that is just the way it is//hm// that is - either you are a fisher and then and then you also want to have (.) the most: and (.) Yes. and that is also somehow a competition."* (F4, Paragraph 30)[29]

F4 negotiates the description of social interaction within the orientation framework of competition. He assumes that the earnings depend on the diligence of the respective fisher and also on his attitude towards competition and the willingness to *peer*. He moves with his description to the classical principle of the utility maximiser—as (Hardin, 1968) has already assumed for resource users—and is considering this rationalization of action also for the other fishers (*either you are a fisher and then and then you also want to have the most*). He reinforces this narrative with his reference to fishing as *competition*. There is a strong orientation towards others, as competition only makes sense when there is distinction of and competition with other fishers (*there is no fisher, who doesn't grudge his colleagues*). He describes this as the *charm* of fishing and thus gives the competitive framework a positive connotation, because it challenges him to do his best.

The social contacts as part of the social practice are bound to different locations: there is the selling and chatting on land and competition at sea. Through the positive construction of the social togetherness, social contacts act enabling for the social fishing practice of the fishers.

In an open question, the interviewers asked fishers about their challenges in fishery in general. Although this question mostly elicited argumentation in the interviews, these interview passages can also help define the discourses within which the challenges are framed from the fishers' perspective. It was noted in part that fishers seem to be presenting their arguments not for the first time during the interviews but have done so before and therefore had practice in arguing.

[29] „Und das is der Anreiz ne, wenn ich: viel gearbeitet hab, und- dann hab ich in der Regel auch n büschn was verdient. (.) und (.) und irgendwo auch dieses Konkurrenzdenken ne, d, n, (2) besser zu sein, wie der andere, und, das:, das is einfach der Reiz.ne, (2) auf jeden Fall. (2) B: naja was he- klar gel- geluschert wird irgendwo //hm// ne, (2) aber ne: f (.) Ja f(2) das: das is dann auch s- (2) man sacht ja auch immer na (3) also es gibt kein Fischer, der (.) sein Kollegen (.) dad selbe (.) gönnt wie also genauso viel ne, sowas gibt es einfach nich, auch wen=wenn man das immer das is einfach so //hm// ne das is, entweder bist du Fischer und dann un dann willst du auch na (.) am meisten haben: und (.) Ja. und und das is auch ergendwo n n Wettbewerb, (F4, Paragraph 30)

The presented challenges mostly refer to everyday working life. At this point, however, they are presented independently of the analyses of everyday working life (cf. chapter 5.1.4.), since they are not only present in narratives about everyday working life, but also find expression in narratives about other topics. The challenges are located in different spheres (ecological, management, and health) but are always understood as a constraint and not as enabling of the own fishing practice.

Fishers discuss issues set in "nature" as challenging and constraining for their fishing practice. This is especially interesting because it provides a counter-horizon to the attachment to nature that was discussed in the previous section. Thus, while the attachment to nature, which corresponds to more romanticized conceptions of nature, is fundamentally motivating for fishers, other aspects of nature cannot be romanticized and do not generate attachment.

> *"The biggest challenges. (2) Well, that's, that's the wind (.) wind, current and (.) depending on which season you're standing where (.) now for example in, in summer you have to watch out a lot that uh(.) you can't have the nets standing everywhere. First of all, if the, if it stands too long or what, if you are more in coastal area then you have many, many crabs inside and then it means only work // yes//. Or if then, then the sea also blossoms (.) if the water is warm (.) //hm// that means then dirt forms //hm// so algae and stuff like that right? //ah yes//. And then if there is a bit of current or what or a bit of wind, then you have the nets also quickly (.) quickly full of dirt //yes// and then you just have to work with it."* (F11, Paragraph 33)[30]

F11 considers the weather as a factor that cannot be influenced to be the *biggest challenge*. He then describes his professional handling of various seasonal conditions, based on his ecological knowledge. Although he has various strategies for dealing with weather-based factors, he still finds these nature-based factors the most challenging, since he is not mentioning challenges from other areas.

[30] „Die größten Herausforderungen. (2) Joa das ist, das ist der Wind (.) Wind, Strömung und (.) je nachdem zu welchen Jahreszeit man wo steht (.) jetzt zum Beispiel im, im Sommer muss man viel aufpassen das äh(.) da kann man nicht überall die Netze stehen haben. Erstmals wenn das, wenn das zu lange steht oder was, wenn man mehr in Küstenbereich ist denn hat man viele, viele Krebse drinne und dann macht das auch nur arbeit //achso, ja// O:der ((räuspern)) wenn also denn, denn blüht die See auch auf also (.) wenn das warm ist das Wasser (.) //hm// das heißt dann bildet sich Schmutz //hm// also so Alegen und so'n Zeugs ne? //ah ja// Und wenn dann bisschen Strom ist oder was oder ein bisschen Wind, dann hat man die Netze auch schnell (.) schnell voll allo, also Dreck //ja// und dann hat man nur Arbeit damit so." (F11, Paragraph 33)

Other challenges strongly embedded in ecological spheres are resource competitors in the form of cormorants and seals.

> *"First of all, it's the cormorants, (1) they chase everything away. //hm// Is: (.) so in LOCATION H at the harbor (2) the fish crawls under the pier there. (1) It jumps out of the water. Because it's so afraid that it won't swim into the open water, because it knows exactly (1) there are the cormorants (.) and they fish everything away. […] And in the Baltic Sea it looks the same. There are the seals. (1) Everything is full of seals. //hm// (.) Uh, the people all say, yes, (.) that's all beautiful, and uh there I see a seal, and a grey seal and, oh and man, that's all so beautiful. (.) But then it's not so beautiful. Because (1) one must always say one man's joy is another man's sorrow: (.) Because:, the seals (2) the (1) are so: after the fish, never mind (.) what is in the nets. We have (2) I have also always stated that I have depredation damage. We have so much depredation in the nets. (.) The fish, they don't run anymore (.) and look for something to eat. No, it just runs away from the seals. Here is the five-mile zone from the coast, where the the seals always can get the fish daily. And at the Greifswalder Oie also. //hm// There are no (1) fish left at all. //hm// The fish is gone*." (F10, Paragraph 9)[31]

Fishers perceive seals and cormorants to have a significant impact on the success of their fishery (Marzano et al., 2013, p. 401) and during some interviews, fishers applied fatalistic linguistic expressions that exclude the possibility of coexistence of the species with the gillnet fishery. Seals and cormorants are portrayed as strongly obstructive in areas of high abundance. At the same time, fisheries management is criticized for its lack of countermeasures, implying a lack of interest in the conservation of fisheries, which leads to the next challenge.

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[31] „Erstmal sind das die Kormorane, (1) Die verjagen alles. //hm// Is: (.) so in LOCATION H im Hafen (2) da kriecht der Fisch unter den Steg unter. (1) Da springt er aus m Wasser raus. Weil er so viel Angst hat, dass der nicht mehr in das offene Gewässer reinschwimmt, weil der genau weiß, (1) da sind die Kormorane (.) und fischen alles weg. […] Und in der Ostsee sieht genauso aus. Da sind das die Robben. (1) Alles ist voller Robben. //hm// (.) Äh, die Leute sagen alle, ja, (.) das is alles schön, und äh da seh ich ne Robbe, und ne Kegelrobbe und, ach und Mensch, das ja alles so schön. (.) So schön is es dann aber dann doch nicht. Weil (1) Man muss es immer dazu sagen, ä:hm: des einen Freund is des anders Leid. (.) Weil:, die Robben (2) die (1) sind so: hinter den Fisch her, ega:l (.) was da is, in de Netze. Wir haben (2) Ich hab auch schon angegeben hier immer Robbenfraß. Wir haben so viel Robbenfraß in den Netzen. (.) Der Fisch, der läuft ja, nicht mehr (.) und sucht sich was zu fressen. Nee, der läuft nur noch vor die Robben weg. Hier halt sich ja die unteren fünf Meilen vom Land, wo da die Robben immer täglich: ran könn. Und an der Greifswalder Oie auch. //hm// Hält sich überhaupt gar kein (1) Fisch mehr auf. //hm// De- Der is weg. (F10, Paragraph 9)

Ecological challenges are reconstructed as constraints and can be seen as an exogenous influence on the social fishing practice of fishers.

A critical examination of fisheries management takes place in arguments about fishing controls as well as about quotas.

> *"Yes.(.) We get only neck blows everywhere, don't we? //hm// (2) So we were back to the topic, starting with water police, fisheries control, //hm// the BLE[32] also, (.) check papers, (.) water police checks two times, then customs comes into play, then the Federal Maritime Office is there, one thing leads to another right? (.) So let's say, I don't want to say fair game, but (1) it's like that. And then the stupid Mofine [33]? //hm// (.) That's even worse. (.) Yes, before we only had to enter data //hm// and now we are monitored right? (1) And then, as I said, all that's missing is the monitoring from bed to work, right? Everything is perfect. (.) In the GDR there used to be a guard boat, (.) huge spotlights, //hm// and today? (.) You can't even think about it, can you?"*
>
> (F13, Paragraph 53 - 55)[34]

The various regulations that apply to fishing are controlled by different entities. While some fishers address the controls as part of their daily routine, the monitoring is often discussed in the manner of surveillance and as a restriction. F13 uses the term *fair game*—he does say that he does not want to use this term, but then immediately qualifies this statement (*but it's like that*). He sees a culmination of control mechanisms, which he equates with surveillance, in the use of MOFI. The fisher, who was socialized in the GDR, draws a reference to surveillance in the GDR where the fishers were watched to ensure that they did not use their privileges to

[32] BLE is the "Bundesanstalt für Landwirtschaft und Ernährung" (Federal Agency for Agriculture and Food) and the central German implementation agency for the Ministry of Agriculture and Food. Among other things, it ensures compliance with legal regulations in fisheries and manages national catch quotas.

[33] MOFI is an app that enables fishers to trace their fishing activities, including setting and hauling of nets. In 2018 the application of MOFI was obligatory during the closure due to cod spawning, when fishers still wanted to go fishing in non-spawning areas (Bundesanstalt für Landwirtschaft und Ernährung (2018))

[34] „Ja.(.) Wir kriegen ja überall nur Nackenschläge oder nicht? //hm// (2) So waren wir wieder bei dem Thema, da fängt Wasserschutz an, Fischereiaufsicht an, //hm// da fängt die BLE an, (.) Papiere kontrollieren, (.) Wasserschutz kontrolliert zwei mal, dann ist der Zoll da, dann ist das Bundesamt auf See da, kommt eins zum anderen ne? (.) Also wollen mal sagen, ich will nicht sagen Freiwild, aber (1) ist so. Und denn die scheiß Mofine? //hm// (.) Das ist noch viel schlimmer. (.) Ja vorher mussten wir immer nur Daten eintragen //hm// und jetzt werden wir überwacht ne? (1) Und dann wie gesacht, dann fehlt nur noch die Überwachung vom Bett bis zur Arbeit ne? Alles perfekt. (.) Früher DDR gabs nen Wachboot, (.) riesen Scheinwerfer, //hm// und Heute? (.) Darf man gar nicht drüber nachdenken ne?" (F13, Paragraph 53 – 55)

cross the border. The checks and the associated perceived restrictions are contrary to the romanticized image of free fishers drawn above. The contrast between an ideal conception versus a real conception becomes apparent. Furthermore, in terms of fisheries management, the quota regulation is also discussed as challenging. Quotas, designed by fisheries management and interpreted as a constraining factor for social fishing practice can be understood as social facts, with which every actor is confronted and which objectively limit their scope of action. They are determined from the outside and embody what others consider right and appropriate to do (Giddens, 1984, p. 172).

> *"Challenges. Yes, challenges are currently the quotas (.) I, too, what I said earlier, cannot look into the future. You can no longer plan from one year to the next //yes// uh:: because you don't know what to expect. That's the bad thing. In the past, you knew approximately what you were allowed to fish (.) how much comes in, however, the planning is completely thrown overboard, because the quotas are constantly being changed (.) and you can no longer hold on to them. That's actually the biggest challenge. (.) Everything else you know, you know, (.) you know how to deal with."*
>
> (F15, Paragraph 35)[35]

F15 sees the quotas as diametrically opposed to his need for long-term planning. If the future is interpreted as uncertain, fluctuating, and unpredictable, then fishers can only arrive at their decisions to act through evaluative trade-offs, but cannot pursue long-term projects (*You can no longer plan from one year to the next […] because you don't know what to expect.*). Thus, the current quota system tends to constrain the activation of a projective tendency because it requires short-term and medium-term trade-offs.

[35] „Herausforderungen. Ja Herausforderungen sind momentan die Quoten (.) auch ich, was ich vorhin schon sagte, kann nicht in die Zukunft gucken. Man kann nicht mehr planen von einem Jahr aufs Andere //ja// äh:: weil man nicht weiß was einen erwartet. Das ist das Schlimme. Früher wusste man ungefähr ja was: darf man fischen (.) schon so viel kommt rein aber die Planung ist völlig übern Haufen geschmissen, weil ständig (.) die Quoten eben geändert werden //ja// und man sich daran nicht mehr festhalten kann. Das ist eigentlich die größte Herausforderung. (.) Alles Andere kennt man, weiß man, (.) weiß man auch mit umzugehen" (F15, Paragraph 35)

Digression: The “hidden agenda”

The “hidden agenda” is a category that is introduced at this point to describe a phenomenon that was not anticipated before. During the interviews, fishers often referred to the fact that the future of fisheries is directionally controlled. Not in the sense of an active fisheries policy, but rather in the sense of a hidden agenda by “them.”

> *“Maybe it's a done deal, I don't know. That they only want industrial fishing. Seems that way to me."* (F9, Paragraph 163)[36]
>
> *"We have had 17 large vessels, now we have two left and that's not because there was nothing to fish for. (.) that's really: (2) really. I say. (.) it was probably destroyed systematically."* (F4, Paragraph 2)[37]
>
> *"My son, (.) the oldest, is (2) now, he's turning 16. (.) And (1) he also wanted to join in, in fishing. (1) But I can't do that to him. What should he do later? (1) He can't feed himself. He can't. (1) Even if I give him everything and do everything. But, they don't want us anymore, right."* (F10, Paragraph 19)[38]
>
> *"Yes, it's all going on somehow: (.) behind the scenes. (2) It's all mafia //@(1)@// I don't think I want to know what's going on there."* (F12, Paragraph 114)[39]

Although the data of this study is not analyzed numerically, it is considered appropriate to mention that passages under the category of “hidden agenda” were coded in 13 interviews (out of 22). The quotes shown correspond to a selection. Nevertheless, especially with regard to the question of management recommendations discussed later, it must be kept in mind that many fishers see themselves exposed to a power that they cannot further describe or classify and against which they cannot defend themselves. Many quotes suggest that they

[36] „Vielleicht is das gemachte Sache ich weiß das nich. dass die nur die Industriefischerei haben wolln. kommt mir bald so vor.“ (F9, Paragraph 163)

[37] „Wir ham 17 große Kudder gehabt jetzt haben wir noch zwei. ne, und das liecht nich dadran dass da nix zu fischen war. (.) das is wirklich: (2) wirklich. ich sach da. (.) richtig mit sis=System kaput gemacht worden.“ (F4, Paragraph 2)

[38] „Mein Sohn, (.) der größte, der is (2) jetzt, der wird 16. (.) Und (1) der wollte auch mit machen, in der Fischerei. (1) Aber das kann ich den gar nicht antun. @(.)@ Was soll der denn, später mal, (1) Der kann doch nix ernähren. Geht nich. (1) Selbst wenn ich ihn dann alles schenk und mach und tu. Aber, die wolln uns ja nich mehr haben, ne.“ (F10, Paragraph 19)

[39] „Ja, das läuft da alles irgendwie: (.) hinter den Kullissen. (2) Alles Mafia. //@(1)@// Ich glaub, ich will gar nich wissen, was da alles abläuft.“ (F12, Paragraph 114)

consider fisheries management to have as its purpose the demise of fisheries (*they don't want us anymore*). However, “they” is never made explicit and so no assumptions can and should be made about it at this point. More important is the consequence of this perspective for management implications. If fishers suspect a hidden agenda in fisheries management, then this could also mean that they are harder to reach for interventions. It is also intriguing that this assessment emerges regardless of which dominant agency the fishers document in the interviews. In the context of bycatch, this is particularly fatal when almost conspiracy-mythical stories or sailor’s yarns about protected goods are circulating, as is the case, for example, with the increasing seals in the Greifswald Bay:

> *"The seals were deployed here. It is a fact. They did not come alone. //Alright, mhm mhm// and that was arranged. One can organize them and can bring them uh, in containers or with a ship and release them. Because there used to be - (1) one says, there are - I don't know, around 70,000 at the moment probably in the Baltic Sea, seals. But the ones that were suddenly there overnight, that's nonsense, that's not possible at all. At that time, we saw one or two seals. Or even once, if someone was there, they were like - look, a seal. But what happens now. You can't, uh, uh, (.) I’m just saying, (1) Then you can’t say, you have a contract or you say, tomorrow there will be fish, (.) you don't know when that will be eaten [away by seals], maybe, right."* (F2, Paragraph 28)[40]

F2 presents—for him—an inherently logical narrative that explains how it was possible that many seals could come to the Greifswald Bay in a short time, based on the assumption that they could have not come naturally as quick as they did. His plausibility is thereby not located in an ecological sphere, but in the narrative-interpretive form of conspiracy myths. While an exact discussion of the underlying mechanisms and modes of action of conspiracy ideas would lead too far at this point, it is important to know that among the fishers not only abstract ideas of the power of “them” are widespread, but in some cases very concrete ideas about how this power is used against fishers prevail. Further, these statements also testify to a great distrust

[40] „Die Robben wurden eingesetzt hier. Ist Fakt. Die sind nicht alleine gekommen. //Achso, mhm mhm// und das wurde veranlasst. man kann die ja organisieren und kann die äh, in , in Behältern oder mitm Schiff bringen und die aussetzen. Weil es gab vor (1) man sagt, es sind - ich weiß nicht, bei 70 Tausend zur Zeit wohl in der Ostsee, Robben. Aber die, die auf einmal von heut auf morgen da gewesen sind, das ist Quatsch, das geht gar nicht. Wir haben damals mal ein, ein, zwei Robben mal gesehen. Oder mal- Überhaupt, wenn da einer mal da war, ohr guck mal ne Robbe. Aber was jetzt passiert. Du kannst ja gar nich äh äh äh, (.) sag mal so, (1) Dann sagen, du hast n Vertrag oder du sagst, morgen gibts Fisch, (.) weiß du gar nich, wann das abgefressen is vielleicht, ne.“ (F2, Paragraph 28)

towards institutions that have resources and power to intervene in the fishers' daily lives—be it directly like fisheries management institutions, or indirectly like fisheries research institutes that advise fisheries management through their scientific recommendations.

Attitude towards gillnets and alternative gears

As mentioned before, another focus of the STELLA project was on technical solutions to bycatch of marine mammals and seabirds. Therefore, technical solutions were also covered during the problem-centered interviews, exploiting the fact that problem-centered interviews leave room for not only narrative but also such concrete questions as well. When asked about alternative gears and their knowledge and attitude towards them, fishers often answered in the mode of an argumentation, since this wasn't a narrative-generating question. Nevertheless, at times they elaborated on their opinion and gave an insight in what could be practically relevant, when developing alternative or modified gears and implementing them. Before getting into experiences and enabling as well as constraining orientations in the fishers' answers, their attitude towards gillnets is elaborated.

> *"So, there is definitely, you can ask any fisher, definitely, no other, (.) fishing method. //hm// I wouldn't know. It works, it doesn't work any other way. And no one can tell us that it should work with something else. And he should explain that to us or really (.) uh. They should explain to us uh uh, how they imagine it could be, nwa- what there could be. //hm// (.) In the: uh theory. (.) everything can be done on the computer. (1) There you can:-"* (F2, Paragraph 181)[41]

F2 strongly emphasizes his belief in gillnets. He believes that there is *definitely* no other fishing gear for all fishers. He is convinced that there is no other way of fishing and that people who believe there are alternatives to gillnets do not have practical fishing experiences, but are localized in a theoretical sphere, working on a computer.

[41] „Also es gibt definitiv, da kannste glaub=ich jeden Fischer fragen, definitiv, keine, andere, (.) Fangmethode. //hm// Wüsst ich nich. Es geht, es geht nicht anders. Und das- kann auch keiner erzählen, dass das äh äh, mit was anderm funktionieren sollte. Und der soll uns das mal erklären oder wirklich (.) äh. Die solln uns doch mal erklären äh äh, wie sich das vorstellen, nwa- was es da geben kann. //hm// (.) In der: äh Theorie. (.) is auf m Computer alles zu machen. (1) Da kannst du:-" (F2, Paragraph 181)

Fishers describe gillnets as a gear and fishing method *without an alternative*. They apply superlative narratives to describe gillnets and their experiences with it.

> *"It's the gold standard, that's just the way it is."* (F16, Paragraph 175)[42]

The fishers document a close attachment to their fishing practice with gillnets. This attachment to gillnets is made plausible in different ways: ecological advantages, economic advantages, and habit.

Fishing with gillnets has some ecological advantages. It is size selective, which means that big mesh sizes will only catch big fish and not undersized small ones. Besides that, gillnets are considered to have a low carbon footprint and low sea bottom impact (Kratzer, 2021, p. 7), but also a poor species selectivity (He, 2006, p. 12). While these insights are dominating in the scientific discourse, they do not necessarily echo with the fishers' discourse.

> *"In my opinion there is nothing better than gillnets. (1) It's selective, it protects the small fish."* (F17, Paragraph 15) [43]

> *"In the gillnet fishery you have no bycatch[44], you have really only (1) let's say 95 percent uh uh of the fish that you can also use, (.) that is, yes, the way it is, through the meshes you can control everything //hm// very well."* (F16, Paragraph 211)[45]

F17 explains that the selectivity works in favor of the fish, because small-size fish do not get caught. F16 also argues that he uses gillnets in such a way that they would not attract bycatch. This way fishers frame their fishing practice as a sustainable practice. This argumentation merges seamlessly into a monetary argumentation, since sufficiently large fish can also achieve corresponding prices. Gillnets are efficient because they are not labor intensive, can be handled by one fisher alone, and are not expensive to purchase in the first place. Another plausibility that fishers cite is based in habitualized practice. They argue that they have always been using gillnets and, in some cases, did not learn anything else. This line of argumentation

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[42] „Maß aller Dinge ist, ist einafch so," (F16, Paragraph 175)

[43] „Meines Erachtens gibts nichts Besseres wie Stellnetze. (1) Das is selektiv, da werden die kleinen Fische geschont." (F17, Paragraph 15)

[44] Here: bycatch of undersized fish.

[45] „In Stellnetzfischerei hast du ja kein Beifang, du hast ja wirklich nur (1) sag ich mal zu fünfunfneunzig Prozent äh äh den Fisch den du auch verwerten kannst, (.) das ist ja, ist so, durch die Maschen kannst du das //hm// sehr gut steuern alles." (F16, Paragraph 211)

echoes with an iterational agency, where schemes of action learned in the past are reproduced.

> *"No. So, I only know gillnet fishing, I didn't learn anything else."* (F11, Paragraph 86)[46]

Nevertheless, there are fishers who already apply gear other than gillnets, and some argue that anything else would not make sense, regardless of whether they have used other gears than gillnets. The fishers that decide to stick only to gillnet fishing document evaluative reflections when they narrate how they have tried different gears before, such as trawls or long line, but ended up with applying mostly gillnets after these trials. A popular current complementary gear to gillnet—not alternative gear—are big fishing traps (weirs). They were discussed widely and fishers who apply them enjoy the handling and building that is involved in operating weirs.

> *"There's a whole other set of alternatives on how to get cod. Like with certain types of weirs, or so. (.) Uh what for- (1) I can also build such things. I have one, too. //hh// A whole weir, where all the small fish go through, and only the ones that we need stay inside. (3) I already have something like that. (3) //hm// Nobody builds them anymore, because they don't know how. (2) How it was done in the past by the old ones, yes. They are mostly retired and the younger ones get these nets prefabricated. (1) Yes. And then they go off with them. //yes// I had to build my first ones all by myself. All the weirs, everything. (2) And that's why I know how it all works. //Yes//. (2) And otherwise I also did with their weirs. I always say, when- (.) w=we always LOCATION I - cod, there the cod is so thick, that is °but°. (3) There, if we could set out a weir, Ohh."*
>
> (F19, Paragraph 131)[47]

Weirs are more difficult to handle and ask for more complex fishing practices, including old knowledge that needs to be transferred from older fishers to younger ones. F19 advertises

[46] „Ne. Also ich kenn nur Stellnetzfischerei, was Anderes hab ich nicht (.) //ja// hab ich nicht gelernt so." (F11, Paragraph 86)

[47] „Da gibt es ganz andere Alternativen, wie man den Dorsch. So wie mit bestimmten Reusenarten, oder so. (.) Äh was für- (1) Kann auch so ne Dinger bauen. Ich hab auch eine. //hh// Ne ganze Fischreuse, wo die ganzen klein Fische alle durchsausen, und nur die drinne bleiben, die w brauchen. (3) Sowas hab ich schon. (3) //hm// baut gar keiner mehr, weil set gar nicht kenn. (2) Wie das früher gemacht haben, die Alten, ja, die sind meistens in Rente und die Jüng- die Jüngeren kriegen diese Netze vorgefertigt, (1) Ja. Und dann ziehen se los damit. //ja// Ich musst mir meine ersten alle selber bauen. Ganzen Reusen, alles. (2) Und daher weiß ich auch, wie das alles funktioniert. //ja//. (2) Und sonst hab mit den Reusen auch. Ich sag immer, wenn- (.) w=wir immer äh: ORT I Dorsch, da steht der Dorsch ja so dick, das is °aber°. (3) Da=wenn so ne Reuse setzen können. ne Fischreuse. Ohh" (F19, Paragraph 131)

that in weirs small fish also escape and only big ones are caught. At the same time, fish in weirs are still alive and can therefore be released if they are not relevant for selling. Applying weirs is presented as a complex process, starting with having the practical knowledge. Based on that, weirs need to be built and adapted to the location where they are supposed to be placed. F19 knows his gear and how to handle it, because he was building his weir from scratch. He sets himself apart from younger fishers who have their nets built for them. There seems to be a limitation as to why he cannot put a weir out where he would like to. This is not further discussed, but based on other cases, these constraints could be based in the authorization process, which at the moment makes it hard for fishers to place weirs. It could also be based in the handling process, since weirs mostly ask for more than one fisher at the same time to handle it or the comparatively high cost that is involved in purchasing a weir. Therefore, possible constraints, which are not further explicated by the fishers, could be found in a structural sense, but could also originate from the actor's side.

Some fishers have also collected experiences in working together with research institutions such as the Thuenen Institute to test modified or new gears. Some others have watched these processes and have also reached conclusions about the experimental trials.

> *"How do you want to change something like that? What do the researchers want to come up with? I have- We- There was already once the talk of, there was a project, we were immediately the first to have participated. (.) There were then fish traps. In order to also reduce the bycatch so:=f bycatch and=and whether one: just to have no seabirds and seal bycatch right, //hm// fish traps were (1) used. They were delivered here. I don't know how expensive they were. They weren't exactly cheap, I think. (.) So, and then they put them in, (.) and there was nothing in it. Or very little. (1) //hm// It wasn't worth it for us at all. //hm// And next to it was a gillnet, (.) it was full to the brim.[...] And at*

some point, I don't know, the stuff was in the back here with us. (...) At some point they picked them up again. //yes// ~I know-" (F6, Paragraph 204)[48]

F6 talks about his engagement with a fishing-gear research project, stating that he generally feels comfortable trying something new. Nevertheless, he had high expectations towards this experimental gear, which in the end it could not fulfill (*It wasn't worth it for us at all*). His expectations are focusing on caught fish and therefore ultimately on revenue, as opposed to the researchers' expectations, who developed fish traps as a bycatch mitigating gear. He characterizes the traps as a counter-horizon to gillnets: they are expensive and do not catch much fish—gillnets are characterized by their high catchability and their low purchase price. At the end of his experience, the fish traps were lying around and were not used anymore before they were collected again. He describes this in a disillusioned manner, which is also reflected in his description of the application before.

5.1.3 Experience with alternative gears

In the interview sections about alternative gears to gillnets, fishers present arguments why alternative gears are not working for them. They make plausible why they themselves are not applying them, but continue to favor gillnets. Instead of focusing on their line of argumentation, I want to turn their arguments around and present criteria that need to be fulfilled in order for fishers to consider alternatives to gillnets. This does not guarantee that fishers would use these devices if the criteria they are discussing would be fulfilled. I rather anticipate that a switch to different gears will depend on evaluative and projective agency. Nevertheless, the fishers' demands in combination with different agency types can be kept in mind when developing new gear or promoting the use of bycatch mitigating gear. The constraints fishers list are inter alia technical aspects: their vessels are in parts too small to handle and store, for example, fish traps. Concerns about the catchability of alternative gears and the possible additional labor that needs to be invested are located in economic

[48] Wie will man sowas ändern? Was wolln die Forscher sich ein- einfalln lassen. Ich hab- Wir- Es war ja auch schonmal die Rede, da wurd auch so n Projekt, wir warn gleich die ersten, die auch sowas mitgemacht haben mit, (.) Da wurden dann Fischfalln. Um auch den Beifang so:=f Beifang und=und ob man: ebend keine Seevögel und Robbenbeifang ne, //hm// wurden Fischfalln ebend (1) verwendet. Die wurden hier geliefert. Ich weiß nicht, wie teuer die waren. Die warn nicht grad billig, glaub ich. (.) So, und dann hat- haben die dann reingestellt, (.) und da war nix drin. Oder ganz wenig. (1) //hm// Hat sich überhaupt gar nicht gelohnt für uns. //hm// Und daneben stand n Stellnetz, (.) das war rappelvoll voll.[…] Und irgendwann weiß ich auch nich, dann lagen die Dinger hier bei uns hinten. (.) Irgendwann ham se die wieder abgeholt. //ja// ~ich weiß- (F6, Paragraph 204)

orientation frames. Following from that, alternative gears should be easy to handle, have a comparable catchability to gillnets, and should not entail additional labor. A last argument against using alternatives to gillnets, which will be difficult to draw a lesson from, concerns fishers who claim that they have no bycatch and therefore do not see the necessity to transform their social fishing practice.

> *"No, if that makes my work more difficult, to fish with weirs or something, then no. (.) //hm// I have now- I can only speak for myself, I don't get ducks, I don't get (.) porpoises, I get along fine with it (.) with my nets, I don't hurt any humans (.) so why should I change then."* (F3, Paragraph 244)[49]

There are also fishers who agree to try alternative gears and their willingness documents evaluative or projective dimensions of agency. Some fishers argue that they would need an explanation for the application of new gear; some are in search for new challenges in the long run.

> *"Everything that makes sense, right, why not. (3) I mean, reasonably explained, (1) that (2) advantages arise, (.) or that it makes sense, really, //hm// of course. (4) //hm// (4) A lot of nonsense is produced, I say, right."* (F8, Paragraph 201)[50]

F8 presents his general interest in trying new gear but is linking it to the requirement that someone made plausible to him why this gear would be useful (*advantages arise; makes sense*). He underlines the importance again by saying that a lot of nonsense is also produced. At this point, however, it remains unclear whether he is referring to previous experience or making a general statement. Nevertheless, he states his willingness to transform his fishing practice at least for a short time and try out something new, although not unconditionally.

> *"Yes, I'm still looking for a challenge, and I think that also goes in the direction of, uh, what you're practically (.) heading for a bit. (1) I would like to renew myself professionally. //mhm// Uh, operationally. (1) I would like to try a new type of fishing*

[49] „Nee, wenn das meine Arbeit erschwert, so mit Reusen oder irgendwas, dann nicht. (.) //hm// Ich hab ja jetzt- Ich kann ja nur für mich sprechen, ich fisch keine Enten, ich fisch (.) fisch keine Schweinswale, ich komm damit gut klar (.) mit meine Netze, ich tu keinem Menschen weh (.) also warum soll ich mich dann umstellen" (F3, Paragraph 244)

[50] „Alles, was Sinn macht, klar, warum nicht. (3) Ich meine, vernünftig erklärt bekommt, (1) dass (2) Vorteile entstehen, (.) beziehungsweise dass n Sinn macht, wirklich, //hm// klar. (4) //hm// (4) Wird ja auch viel Unsinn produziert, sag ich mal, ne. ." (F8, Paragraph 201)

> *that already exists, long-line fishing. [...] I would like to try it out. I talked about it with a netmaker years ago. //hm// [...] And, years ago, I was also at a trade fair, (.) in, in Aalburg //mhm// (2) Yes, but that was not yet so fully automatic, that: was still in its infancy. And if you go on the Internet, you can really look at it completely. //hm// In Norway (1) something like that has been done for a long time."*
>
> (F18, Paragraphs 63-71)[51]

As opposed to the evaluative process documented by F8, F18 shows projective dimensions of agency and has a long-term goal in mind, which he has been acting on for some time now. He reflects that he is ready for a new challenge and sees that challenge in the use of long lines. After developing his project in his mind, he acts on it and starts to talk to experts about it, visits trade fairs and does research on the Internet. So far, he has not changed his actual fishing practice, though.

The last part of this section turns to the management and therefore the structural side of alternative gears. Fishers discussed different management measures during the interviews and shared their opinions on them as well as documented constraining factors in connection with different management tools. During the interviews I asked the fishers about three specific management tools: ecological certification (e.g., Marine Stewardship Council, MSC), more quota in exchange for the use of bycatch mitigating gears, and financial compensation if these mitigating gears would catch less fish. Herring fishers in the area of Greifswald Bay have tried to get an MSC certificate some years ago, but could not reach the standards demanded. This was, inter alia, due to a bad state of the herring stock. Since the condition of the stock has worsened since then, fishers in that area do not think it is possible to get certified.

In terms of the use of bycatch mitigating gears, there are also fishers who can imagine to switch to a gear with less catchability, if they reach a higher price for the caught fish.

[51] „Ja, ich such noch ne Herausforderung, und, das geht glaub ich auch in die Richtung, äh, was was Sie praktisch (.) so n bisschen ansteuern. (1) Ich würd mich gerne Erneuern, beruflich. //mhm// Äh, betrieblich. (1) Ich würd gerne einen neue Fischereiart, die dies schon gibt, Langleinfischerei, ich würds gern mal ausprobieren. […] Das- Ich würds gerne ausprobieren. Ich hab mich (.) vor Jahren schonmal mit m Netzmacher drüber unterhalten. //hm// […] Und, vor Jahren war ich auch bei- auf einer Messe, (.) in in, in Aalburg //mhm// (2) Ja, aber das war noch nich so voll automatisch, das: war noch in den Kinderschuhen. Und geht man ins Internet, dann kann man sich das wirklich komplett angucken. //hm// In Norwegen (1) wird sowas ja schon schon lange gemacht." (F18, Paragraph 63-71)

> *"Yes, then that would (.) ultimately balance itself out again, right? //Yes.// It's the same with the MSC certificate, (1) right? If you have that, °it's also the same price°//hm// °that's-° //and if you-.// So I would also catch, let's say, less //hm// if I get the price for it accordingly, //hm// right? If in the end it balances out, that's all okay. //hm// Right, we've always said we'd rather catch a little less (1) we'll catch less but at a reasonable price, right, what's the point if you fill up your deck with fish but don't get anything for it? First of all, you have lost the quota (.) and secondly you have nothing in your wallet (.) that's just the way it is. Then you can rather fish a little less and get a reasonable price for it."* (F16, Paragraph 214 - 215).[52]

F16 is presenting a "quality over quantity" take on fishing, which also considers diminishing quotas. He is negotiating the topic in an economic orientation frame, claiming that it will be important to him that less fish will not mean less income (*If in the end it balances out, that's all okay*). He is generalizing his opinion and assigning it to other fishers and past times as well (*we've always said*). In this manner he is framing it as mutual knowledge that has a shared validity among a group of people, but also over different periods of time. When it came to more quotas in connection with the application of alternative gears, fishers were mostly still confused about the possible mechanism behind it. The gears they had in mind would mean a lower catchability, so a higher quota would not make sense if they would not feel enabled to catch enough fish. At the same time, they were wondering where an extra quota should come from. I could not answer this, and that was another reason why these questions were difficult to deal with during the interviews. Fishers were also asked their opinion about hypothetical financial compensation in connection to the application of alternative gears. Since fishers already get subsidies, which is connected to bureaucracy, which most of them present as a constraint, this idea was not appealing amongst fishers.

> *"I can say it right now, no fisher wants that. Compensation payment. He wants to work for his money. //Yes, no fisher really wants that. //mhm// Compensation payment.*

[52] „Ja dann würde sich das ja (.) letztendlich wieder ausglF6n, ne? //ja// Das ist ja auch so mit dem MSC-Siegel, (1) ne? Wenn du das hast, °ist ja auch der selbe Preis°//hm// °Das ist-° //und wen du-.// Also ich würde auch sag ich mal weniger fangen //hm// wenn ich dementsprechend: den Preis dafür krieg, //hm// ne? Wenn sich das letztendlich die Waage hält ist das alles okay. //hm// Ne also wir haben immer gesagt wir fangen lieber bisschen weniger (1) wir fangen weniger aber dafür (.) vernünftigen Preis, ne was nützt das wenn du dir das Deck vollschaufelst mit Fisch aber du kriegst nichts dafür. //hm// Erstens hast du die Quote weg (.) und zweitens hast du nichts im Portemonnaie (.) das ist einfach so. Dann kannst du lieber ein bisschen weniger fischen und kriegst dafür nen vernünftigen Preis" (F16, Paragraph 214 - 215)

> *//mhm// (3) I can say (1) right away. I can also speak for (.) all of them right away. Nobody wants that."* (F7, Paragraph 149 - 150)[53]

F7 is emphasizing how fishers want to work to earn money, which for him means to go fishing and not to apply for financial compensation. He is also claiming to speak for all fishers (I can also speak for all of them right away), suggesting that this is part of the fishers' mutual knowledge. He feels very strong about this point, repeating his statements several times. This could be partly due to the fact that he was being interviewed by a researcher from the Thuenen-Institute, who seemed an appropriate contact person for complaints or strong statements several times during the interviews. But it could also be a linguistic means to make his point and leave no room for interpretation in an objective sense. To conclude I would say that questions about hypothetical management instruments were not best placed during a problem-centered interview, even if the focus of a certain problem allows for such questions. Nevertheless, through them it was possible to get an idea of how fishers might react towards the three hypothetical management tools.

In the sequences of the interviews that are in connection to the application and non-application of alternative gears, fishers document different forms of agency. Iterational agency dominates strongly when fishers refer to gillnets as without alternatives, as the best gear there is, especially when these fishers have been socialized with only gillnets and keep applying their established schemes of actions that have been developed and applied throughout their whole career. Some fishers have come to the decision that gillnets are without an alternative after trying different gear. They rather document evaluative capacities. This example again shows that the three types of agency are only analytical categories, since both iterational and evaluative fishers may only apply gillnets, but differ in the way how they established their fishing practice (and therefore might or might not change it). On the other hand, there are fishers who discursively show that they are willing to try and then use new gears if these gears fulfill certain criteria; these also demonstrate evaluative agency but with a different outcome than the fishers described before. On the other hand, projective agency is documented by fishers who plan to transform their fishing practice in the long-term or have

[53] „Kann ich schonmal gleich sagen, will kein Fischer. Ausgleichszahlung. Er will für sein Geld (.) arbeiten. //ja.// (.) Au=w das will eigentlich (.) kein Fischer. //mhm// Ausgleichszahlung. //mhm// (3) Das kann ich schon (1) gleich sagen. Da kann ich auch für (.) alle auch schon gleich mitreden. Also das ähm. //@(.)@// das will keiner" (F7, Paragraph 149 - 150)

done so in the past as a result of long-term considerations. Since the questions concerning management options linked to alternative gears were about rather hypothetical scenarios, there needs to be further research towards a feasibility study in order to create real incentives or reduce constraints.

5.1.4 Professional everyday life

The working rhythm and everyday working activity of fishers presents "normative notions about how fishing should be practiced, and fishers' dependence on different social and ecological contexts" (Boonstra & Hentati-Sundberg, 2016, p. 82). During the interview fishers were specifically asked to describe their *last* day of work. This was done so that fishers could have an orientation on how to answer the question and could remember and describe their day in detail as a closed narrative, because it was assumed that the last day of fishing was not too long ago. Interestingly enough, these assumptions did not work out most of the time. In most cases fishers still described an *average day* of fishing, in their opinion. Albeit the fact that fishers often emphasized that fishing is very diversified work, the narratives document something different, because it came more natural to them to describe an average day than the last actual day of fishing.

> *"Yes (.) it starts at three in the morning. (1) Half past five arriving at the nets (.) then the nets are hauled in (.) then the nets are put out again (.) and (.) yes, when going home the fish is prepared. //hm// And then in the harbor (.) it is weighed, iced, cooperatively right? //hm// (1) And papers are filled out, (.) log book, right? //yes// everything documented in detail. That's the work rhythm every day //yes// right? //that's a lot.// In the end, it sounds pretty one-sided and yet every day is different, right? //hm// (1) Yes and that's what makes it so interesting (.) right?"*
>
> (F16, paragraph 85 - 86)[54]

F16 is reflecting for himself that although he just described fishing in a repetitive way, with the same *rhythm every day,* he immediately corrects his own narrative by stating that *every*

[54] „Joa (.) der geht morgens um drei los. (1) Halbfünf an den Netze (.) dann werden die Netze eingeholt (.) dann werden die Netze nachher wieder ausgelegt (.) u:nd (.) joa beim nach Hause fahren werden die Fische fertig gemacht. //hm// Und im Hafen dann (.) abgewogen, vereist, genossenschaftsmäßig ne? //hm// (1) Und denn Papiere ausgefüllt, (.) Logbuch, ne? //ja// Alles genau dokumentiert. ((Zwischengeräusche und Möwengeschrei)) Das ist der Arbeitsrhytmus jeden Tag //ja// ne? //das sind aber viele// Letztendlich klingt es ziemlich einseitig und doch ist jeder Tag anders, ne? //hm// (1) Joa und das macht es auch so interessant (.) ne?" (F16, Paragraph 85 - 86)

day is different. Subsequently, he does not solve this contradiction and I did not ask him to solve it.

> *"Well, I see that every day is different. Yes, every day is different and that's also the nice thing. (.) Somehow I already know: what (.) when I'm fishing every day, what's coming: tomorrow again. (.) No, but nevertheless every day is different. No day is like the other. The weather is different every day. (.) The currents are different every day, the winds are different every day and the catch is also, more or less, different every day. //hm// ne, (.) And that is also- that is the incentive. (.) No. (.) to have a surprise every day."* (F4, paragraph 62)[55]

F4 resolves the presented ambivalence between the daily routine and the daily *surprise* by attributing the fact that every day can be different to external factors. Conversely, this also means that the actor's social practice is oriented to these external circumstances, but that fundamental social practices are adapted only insofar as these circumstances demand it. Nonetheless, the repetitive character means that social fishing practices in general are characterized by a routine. There seem to be varying routines, depending on the current target species and fishing range of the fishers, but nevertheless they refer to known schemes of action and, by having a routine, act iterational in their everyday fishing practice. It can be interpreted as their most common practical knowledge (Giddens, 1984, p. 328). Although in some cases fishers actually talked about their last day of fishing, they also narrated a routine, referring to recurring practices and reflecting that the last day was an ordinary day, which would most likely be repeated in the same manner the next working day.

> *"Last working day, yes. Let's take yesterday. //Today I just cleaned some fishes. (1) Yes, we get going when it gets light. That's currently at eight o'clock. (.) Just in this cloudy weather. //hm// (1) Then we start here, (.) at the beach, (.) because it's still a bit warm here. So we put on our oilskins. The pants, waders rolled down. (1) Glove, everything that belongs to it. Then it's off into the car. (2) Now I have a pensioner with me, who is also a fisher. And he helps me a bit. //(1) And then we drove to LOCATION I. (.) Then we*

[55] „naja das seh ich jeder Tach is anders. //ja// ne, jeder Tach is anders und das is ja auch das schöne. (.) irgendwo weiß ich schon: ungefähr na: (.) wenn ich jeden Tag am fischen bin was da: morgen wieder auf mich zukommt. (.) ne, aber trotzdem is jeden Tach anders es=is na: kein Tach wie der: wie der andere. das Wetter is jeden Tach anders. (.) die Strömung sind jeden Tag anders die Winde sind jeden Tag anders und der Fang is auch, mehr oder weniger jeden Tach, anders. //hm// ne, (.) und das is doch auch- das is doch der Anreiz. (.) ne. (.) jeden Tach wieder ne Überraschung zu haben." (F4, Paragraph 62)

> *left by boat. It was about half past eight. (1) We checked the nets, (1) we were ready at eleven, half past eleven. //hm// Then we went back to the beach. (3) Cleaned some fishes. (2) Filleting. Exactly. For the customers. //hm// (1) Yes. (3) Well, that's basically the end of the day. (3) Then (.) I have a little lunch, and in the afternoon, I sit here and repair (1) some nets. Couple of eel traps: and whatever else comes up. //hm// Yes. (2) So, at the moment it's relatively relaxed. (.) Right, no stress. //hm// (3) You don't have to check the nets every day, the water is cold enough. (1) The fish are mostly alive. (.) So next time I'll go again on Thursday. //hm// Yes, the day will be similar. (2)*"
> (F8, Paragraph 51)[56]

The working day is divided into several phases, oriented towards specific time frames: preparation, fishing, and post-processing. The preparation phase consists of getting dressed in work clothes, checking and maintaining the engine and vessel in detail, and checking for all the equipment so that the fishers do not miss anything once they are at sea. In other cases, the morning routine at home is already thematized as part of the workday. In these cases, there is no spatial break between the private sphere and the work sphere. Preparation is followed by the fishing itself, during which fishers drive to their fishing grounds, check their nets, and retrieve and set them again. Logically, fishing is always bound to the spatiality of the vessel and the Baltic Sea or Greifswald Bay, respectively. Most fishers are alone during this phase of the work. It is followed by the post-processing: back at the harbor the fish is processed, regardless of the different marketing channels pursued by the fishers, and nets are cleared as well as fixed. Helping hands regularly join the workday during this phase—often supplied by pensioners or wives who assist in the processing of the fish. This mostly informal work is an important resource for the fishers, enabling them, for example, to pursue the more time-consuming and more profitable direct marketing. In cases of direct marketing, fishers usually adapt their fishing schedule towards a certain time at which they plan to arrive in the

[56] „Letzter Arbeitstag, ja. Da nehm wir den gestrigen. //ja// Heute hab ich ja bloß n bisschen Fisch geputzt. (1) Ja, wir fahrn zum hell werden los. Das is zur Zeit um acht Uhr. (.) Grade bei son trüben Wetter. //hm// (1) Dann gehts hier los, (.) am Strand, (.) weil hier is ja immer noch n bisschen warm. Da ziehn wir uns: gleich Ölzeug an. Die Hosen, Wathosen runtergekrämpelt. (1) Handschuh, alles was dazugehört. Dann gehts ab ins Auto. (2) Hab jetzt noch n Rentner dabei, der auch Fischer is. Und, der mir n bisschen hilft. //hm// (1) U:nd dann sind wir zum ORT I gefahren. (.) Dann mit m Boot los. Da war s so ungefähr halb neun. (1) Haben die Netze nachgeguckt, (1) warn so elf, halb zwölf fertig. //hm// Dann gehts wieder zurück zum Strand. (3) Bisschen Fisch putzen. (2) Filetieren. Eben. Für die Kunden. //hm// (1) Ja. (3) Na is im Prinzip schon Feierabend. (3) Dann (.) bisschen Mittag gegessen, und Nachmittags sitz ich hier noch und mach (1) Netze heil. Paar Aalreusen: und was so anfällt. //hm// Ja. (2) Also zur Zeit relativ entspannt. (.) ne, kein Stress. //hm// (3) Man muss die Netze auch jetzt nicht jeden Tag kontrollieren, s Wasser is kalt genug. (1) Der Fisch meistens lebt. (.) Also das nächste Mal fahr ich wieder am Donnerstag. //hm// Ja, wird der Tag ähnlich aussehen." (F8, Paragraph 51)

harbor, in order to be there in time to sell their catch to tourists and local customers. In some cases, fishers emphasized that they could not tell about an average day of fishing (which was not asked for in the first place), because it would depend on the target species and season. So, there are different routines depending on the target species and time of year, but they are nonetheless routines.

Non-fishing days also have a work routine to them, mostly consisting of working on the nets or preparing fish. Although non-fishing days–which are usually related to weather conditions or closed seasons and not to the day of the week—are constructed as days off (*fishers' Sunday* – F10, Paragraph 27), fishers mix private and work lives again on these days, never really leaving the job, as can be understood in the following:

> *"And yes, such days as today, in this storm, it is a vacation day for me. I enjoy that. //Yes// right, but I was already at the harbor this morning, checking, because I looked at the water level. (1) And (.) it (.) was quite heavy this morning //hm// in LOCATION X. Yes, but everything went well, right //okay.// Yes, it would be bad if the rope broke off //hm// or. (1) No, you always have to be on standby, //hm// that's quite clear. (.) Yes. (.)*" (F18, Paragraph 25)[57]

The interview with F18 started at 7:30 a.m. Although it was a stormy day, which means that the fisher could not go out fishing and he himself said this day is like a *vacation day* to him, he still went to the harbor to check on his vessel before the interview. He understands his job as a fisher as being always on *standby (that's quite clear)*, regardless of whether it is a day when he can go out fishing or not. The term *vacation* is generally applied as a counterpart to working days. In this case the spheres cannot be separated from each other and there are also routines for non-fishing days that relate to fishing. This is documented in other cases as well, such as what F8 mentioned above: *Last working day, yes. Let's take yesterday. Today I just cleaned some fishes.* After being asked about his working day, he explicitly negates that what he did today (*cleaned some fishes*) was part of a working day.

[57] „Und ja solche Tage wie heute, im Sturm, is für mich Urlaub. Das genieß ich. //ja// ne, Aber ich war heute morgen auch schon am Hafen, geguckt, weil ich hab mir n Wasserstand angeguckt. (1) Und (.) es (.) war ganz schön heftig heut morgen //hm// in Ort X. Ja, is aber alles gut gegangen, nich- //okay// Ja, wär blöd, wenn die Leine abreist //hm// oder. (1) Ne, da- man muss schon immer Standbye sein, //hm// das is ganz klar. (.) Ja. (.)" (F18, Paragraph 25)

There are several factors influencing the decision to go out fishing. As was noted before, they are located in the ecological sphere and the structural sphere, specifically in fisheries management. From a natural point of view, fishers depend on the weather, specifically on wind. Depending on the size of their vessel and their fishing grounds, they cannot go out in stormy weather. Secondly, they depend on the season of their target species. An important target species in the German Baltic Sea is herring, which only arrives at the coast two times a year, in spring and in autumn. Coupled with a quota, fishers need to decide when and how much to fish in order to fill out their quota. So, the timing is not only based on ecological concerns but also depends on the quota, which is a legal requirement and therefore located in the structural part of fishing practice.

Fishers see constraints in the everyday professional sphere primarily in the challenges explored under 5.1.2. At this point, bureaucracy is mentioned again separately, since it was mainly discussed in connection with activities that concern the work rhythm and not special situations, such as the acquisition of a new vessel. Daily bureaucracy, which every self-employed person endures, is often cited as getting worse compared to earlier times, and rules are identified to be unreasonable.

> *"But then I returned to fishing in ninety-five (.) and (.) yes: (2) from then on, things really only went downhill. Not in terms of fish stocks, but in terms of regulations. //Yes.// In the meantime I would need a secretary here, who should fill in everything //@.@// and what I have to keep here, she normally would have to enter every vessel movement (2) - I have to enter in my logbook. So that is not possible at all with small vessels [...] Actually, uh: I am obliged to keep an additional book (.) where all ship positions are entered and all vessel movements //yes// uh (.) when I take a different turn, so to speak, that should actually all be entered there, but I don't have the time for that. (.) No, when it's shaking and storming outside, uh, then the pen falls out of my hand."*
> (F15, Paragraph 3/9)[58]

[58] „Bin dann aber fünfundneunzig wieder zurück (.) in die Fischerei und (.) ja: (2) ab dann gings eigentlich nur noch abwärts. Nicht was Fische angeht, aber was Verordnungen angeht. //Ja.// Mittlerweile brauch ich hier ja ne Sekretärin, die alles ausfüllen sollte oder müsste //@.@// und was ich hier zu führen habe, die muss normalerweise jede Kutterbewegung (2) muss ich in mein Fahrtenbuch eintragen. //Ja.// Also das is (.) mit kleinen Fahrzeugen überhaupt nicht möglich […] Eigentlich, äh: bin ich verpflichte:t, ein Buch zusätzlich zu fü:hren (.) wo alle Schiffspositonen eingetragen werden und alle Kutterbewegungen //Ja// äh (.) wenn ich quasi ein andren Kurs einnehme, dass das müsste eigentlich dort alles eingetragen werden, aber dafür hab ich nich die Zeit (.) Ne, wenns draußen wackelt und stürmt äh, da fällt mir dann der Kugelschreiber aus der Hand //Ja//" (F15, Paragraph 3/9)

F15 describes a deterioration of the profession in his eye due to the increase in bureaucracy and increase of proofs that fishers must provide currently. He sees himself no longer able to fill out his proofs correctly himself and indicates that he does not do so either. After referring to the norm (*normally*), he then explains why he cannot fulfill this norm, which suggests the interpretation that it accordingly plays no role in his everyday working life. He makes his breaking of the rule plausible, which he believes misses his reality, since he cannot do his bookkeeping while the vessel is rocking. In other cases, bureaucratic obligations and their contents are also constructed as an obstacle, for example in connection with self-marketing.

> *"You have to take care of everything yourself. Right - that's why you need a tax office. They help a lot, of course, and (1) and, yes, the small bookkeeping, that's still manageable. But if things get a bit tighter with the sales accounting, then it won't be possible to manage it on your own. Then (.) you can probably only work for the cooperative. //hm/ ne, (1) But, about that: one will see how that:- develops in the near future."* (F18, Paragraph 15)[59]

F18 has already outsourced many of his bureaucratic tasks and is therefore seeking professional help. However, he is unsure whether he can implement the new accounting rules and is considering discontinuing direct sales because of them. Evaluative considerations based on a potential conflict are documented here. The *tighter* rules will force F18 to decide: either he will leave direct marketing in order not to have to learn new and possibly time-consuming practices, or he will continue direct marketing and will have to resort to new patterns of action for it.

5.1.5 Business management

The fishers are pursuing different strategies to run their businesses. The following paragraph contains more detail about how fishers expand and build their businesses, about their marketing strategies, and about complementary livelihoods.

[59] „Du musst dich um alles (.) ja selber kümmern. ne, //hm// ne, Deshalb (.) brauchst n Steuerbüro. Die helfen natürlich schon viel mit. und (1) und, ja, die kleine Buchführung, das ist ja noch überschaubar. Aber wenn das jetzt noch n bisschen strammer wird mit der (.) Ver- mit den Verkaufsabrechnungen, dann lässt sich das alleine gar nicht mehr regeln. Dann (.) kann man vermutlich nur noch für die Genossenschaft arbeiten. //hm/ ne, (1) Aber, das: wird man sehen, wie sich das:- die nächste Zeit entwickelt." (F18, Paragraph 15)

Procurements

During the interviews, the fishers were asked what procurements they had made in the course of their working lives. This question was answered in part with very detailed descriptions and enumerations. Fishers explained themselves in detail during the interview, and for those fishers who documented evaluative and projective agency in their narratives, the descriptions were always made plausible by them. Similar to *inherited occupation I*, a steadily increasing pattern could be discerned. This is explained in some detail using F18 as an example.

> *"Well, for the company- I have- yes I started with a very small boat, with a small six-meter boat, //okay// I got it cheap- my father wanted to lend it to me first (.) And then, uh, (.) I realized, no you buy it quickly //@(.)@// and he has sold it to me then. (.) Uh, yes and (.) one year later, (.) I already had (.) the somewhat larger boat, the eight-meter vessel. I fished from (.) two harbors, //mhm// once from LOCATION X (.) and once from LOCATION Y (1). And: (1) um (.) because it was really (.) they were good years. It started quite well - I got off to a very happy start, which is very important, otherwise I wouldn't have made it. When money comes in, can you- can you do something with it, right? //hm// No, and yes. (.) There was still a small subsidy at that time, I happened to be unemployed (.) at the time:, (.) when I did my sailor's patent. //And, (.) from unemployment to self-employment, there was a little money for that at that time, and, I don't know, it is probably still like that today, that there is a little support. And, yes, from the money I could buy nets, that was not so bad. //@(.)@// Yes. (.) No, because that was just, was also just the time, (.) when it started with the family and yes (.) buy house and everything- that burdens then nevertheless. //hm// Yes, and if then a bit more money comes in, that is already quite healthy and quite, quite nice. Yes, and then: um (2) I exchanged the small boat, or my father got that back again, I had even built myself a new one. So those were, were quite a few good years. (.) As, as a second boat - port LOCATION X has the disadvantage, there: (.) we often struggle with the water level, //mhm// due to silting up. //And then it's very, very good to have a little less draught. (.) And that's why I bought the boat, and sometimes that (.) yes, a few years later that really annoyed me. (.) Because this draught was then also not enough, n- (.) too much storm (.) and I then had (.) a boat in LOCATION X, either you make it, or you don't make it. //hm// [...] That was, was actually so because, my location is here, (.) at LOCATION Z. I first lived in LOCATION Z, //hm// and (2) yes, then I decided to buy a*

vessel in LOCATION Y. That's, you can't really just do that. That is, you can't just buy a vessel, //hm// you can, but then you can't do anything with it, //@(.)@// you need a quota //hm// right. And, (.) that yes. And (.) you have to- (.) you have to buy it, practically, right. //hm// And (.) that's what I did back then.(.) I broke up the piggy bank a bit (.) and that's how I was able to pay. I think I did it right, my business was actually always paid for (1) and (1) is a bit cold, isn't it? //No// […] Yes, then the vessel arrived at some point in LOCATION Y, with a quota. (1) And, (.) I didn't even fish out the quota. //@(.)@// It was even shortened afterwards. I was not satisfied with the vessel. //hm// Then I exchanged it again, for something similar. And, (.) in LOCATION T, the (.) other vessel (.) was then remodeled again. It used to be - I knew it as a child, the vessel. It was built in 1980. (.) Right. (.) Older than you, probably. Yes, //yes@(1)@// (.) And (3) it was then (.) in z- in LOCATION S I saw it, in LOCATION Y, I saw it and and I always liked it, the vessel. And, (.) yes then, I heard that- or saw him by chance in LOCATION T, because I was on vacation there. //hm// I thought, "Why don't you ask?" (.) And (.) it was actually still registered. It wasn't completely out of the fishery yet, and I was able to swap it. Against the- they were about the same size, the vessels."

(F18, Paragraph 23-25)[60]

F18 tells of a steady increase in obtaining his operating equipment. While he started with a borrowed small boat in the beginning, he gradually expanded and eventually acquired a third vessel that he had his eye on for a long time. He keeps supporting his narrative with background constructions that reveal how he came to his next step. On the one hand, these background constructions move in the structural realm of unemployment support (which gave him an easy start, because there was funding for people who became self-employed after being unemployed) and on the other hand, they also move in the ecological realm, when he relates that there were *good years* (meaning that there were good fish catches in those years, so *money came in*). He could get funding with the establishment of his business due to the previous unemployment, which he also applied opportunistically. Both factors—financial support and good fish catches—are resources that he was able to acquire and use to his financial advantage by applying new approaches to action. His digression on starting a family and buying a house is interesting here. With these background constructions, he includes the

[60] For original transcript, cf. App. F

private sphere in his plausibility. He continues his narrative with the purchase of a newly built vessel, which on the one hand is not uncommon in fishing, but on the other hand should not be taken for granted in principle. However, this vessel now presents him with a technical problem, as it does not have enough draught to always get out of the harbor. F18 can only use his vessel when the water level was right, making him even more dependent on environmental factors. This narrative documents the design of projects as a solution to his dilemma. He solves his problem by developing and implementing a new project: he buys another vessel, which he places in another harbor to have fallback options. He thus continues with his expansion in a continuingly increasing manner. Nevertheless, he soon realizes that the vessel does not meet his expectations and he comes up with a new solution: the purchase or swap with another vessel. He tells the story of the exchange in detail and very personally, referring to the common history—he *knew* the vessel as a child and liked it. This gives the impression that he is fulfilling a long-held wish. The realization of this project is then prompted by a chance meeting with the fisher who owns the vessel, which F18 immediately takes advantage of opportunistically and initiates the process of purchasing the vessel. This description of continuingly increasing business expansion can be found in other cases as well. It entails an upward process without any significant setbacks. The purchases are causally associated with different plausibilities. They document personal ambitions, revealing dominant evaluative and projective dimensions of agency, which enable the purchase of bigger vessels. In one case, the fisher wanted to extend his range, which he could only do with a bigger vessel. He constructs institutionalized norms as a constraint, which made him switch to a bigger vessel:

> *"This is bigger, yes. The other one is ten meters fifty long and (.) three meters sixty wide. Has a dead weight, that thing weighs fourteen fifteen tons. And the other boat has maybe a weight of five tons or six tons, that was relatively small, you know. And then not covered, was an open vehicle. //hm// So everything that water ran in, that the (.) must be pumped out again. And this one is covered. //yes// Seaworthy. Above all, I*

> *have extended my cruising range with this, so I can go further out with it. (..) According to SeeBG[61], //ah// you also have to maintain a sailing range."* (F6, Paragraph 17)[62]

On the other hand, structural conditions were exploited, such as the provision of subsidies.

> *"Because: I had a somewhat larger vehicle built in 2005, with subsidies. (.)"* (F6, Paragraph 15)[63]

These purchases were made opportunistically, sometimes preceded by a dilemma and conflict, as described above for F18. However, these options for opportunistically acquiring further assets are not only found in the structural sphere, but also at the personal or community level:

> *"One of them, a fisher, retired. //hm// And he didn't find a successor either. (.) And then we went there, got him- knew that he was quitting. We went there and asked him if he would sell his vessel. Yes, he would. (.) And we bought the vessel. And now it's lying idle for the time being. (1) And we only fish the quota."* (F6, Paragraph 260)[64]

> *"So, I have, currently I have six vessels. Whenever I earned a little, I always bought vessels from fishers who were in a bit of a financial need or in personal need."* (F17, Paragraph 267).[65]

Regardless of where the plausibilities are located, what they have in common is that they were perceived by fishers as enabling, and they used evaluative and projective behavior to align their acquisitions with them.

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[61] SeeBG refers to the old trade association for fisheries, which is now called Trade Association for Transport and issues rules for companies for the prevention of work accidents.

[62] „Das is größer, ja. Das andere das, dis is zehn Meter fünfzig lang und (.) drei Meter sechzig breit, ne. Hat n Eigengewicht vierzehn fünfzehn Tonnen wiegt das Ding. Und das andere Boot hat vielleicht n Gewicht von fünf Tonn oder sechs Tonn, das war relativ klein du. Und dann nicht gedeckt, war n offenes Fahrzeug. //hm// Also alles was Wasser rein lief, das das das (.) muss wieder rausgepumpt werden. Und dies ja hier is ja gedeckt. //ja// Seetüchtiger. Vor alln Dingen mein Fahrt bereich habt ich hiermit erweitert, kann damit weiter rausfahrn. (.) Laut SeeBG ne, //ah// musst ja auch n Fahrtbereich einhalten." (F6, Paragraph 17)

[63] „Denn: hab mir 2005 n etwas größeres Fahrzeug bauen lassen, mit Fördermitteln. (.)" (F6, Paragraph 15)

[64] „Der hat- Da is einer in Rente gegangen, ein Fischer. //hm// Und der hat auch kein Nachfolger gefunden, (.) Und dann sind wir dahin gegangen, ham ihn- Wussten, dass er aufhört. Sind wir hingefahren und haben ihn gefragt, ob er verkauft, sein Fischkutter verkauft. Ja, macht er. (.) Und da haben wir den Fischkutter abgekauft. Und der liegt nun erstmal still. (1) Und wir fischen nur die Quote." (F6, Paragraph 260)

[65] „Also ich hab, aktuell hab ich jetzt sechs Schiffe. Immer wenn ich n bisschen was verdient hatte, hatte ich mir (.) von Fischern, die so n bisschen: in finanziellen Not- oder in in in in pe:rsönlicher Not waren, hab ich mir immer Schiffe gekauft" (F17, Paragraph 267)

As opposed to projective and evaluative elements there are also fishers who keep their purchases on a maintaining level. They replace broken parts and reinvigorate the vessel if necessary. However, they do not make any major new purchases, but move in patterns that are familiar to them from the past. Thus, the iterational dimension of agency is documented in these narratives. These fishers have had favorable experiences with the resources and social practices which they applied in the past and continue to employ them for these reasons. The following example documents how the fisher reflects on practical evaluative considerations, but then the iterational dimension of agency dominates:

> *"I had thought about whether we could also convert the ship for trawling, so it would work as a combiner for gillnet fishing and (.) but basically it's all just) but that's basically all half stuff. Either you do one right or the other. No, (.) and, bf=and then it starts then you need stronger engine and stronger drive and (.) and what, what we (2) have done now over the years and what my father has done that has worked. Right (.) and (2) I think it's better to stay and, if it works //hm// what do you want to think about, and you are anyway, when you dance at two different weddings you are always somehow: too late. Right, that's right, right. Before you can react. (3) no (3)"* (F4, Paragraph 26)[66]

Since at this point he abandons the considerations to rebuild the vessel and this rebuilding does not actually take place, the actual social practice with regard to the acquisitions can be placed in the iterational dimension. Particularly the statement *I think it's better to stay […] if it works* is characteristic of this. This sentence acts as a justification and plausibility for the act of not converting the vessel. While the expansion to trawling can be interpreted as an expansion into diversity and thus opens up more income opportunities, F4 interprets it as *half stuff* to conduct two different types of fishing. In other interview sections, which are not quoted here, F4 continues to make this decision plausible, moving away from a background construction and towards a justification, referring to the ecological advantages of gillnet fishing. This iterational orientation in terms of diversification and procurements becomes

[66] „Ich hatte, wir hatten früher mal überlecht ob wir na: (.) ob wi:r (.) das:: Schiff auch zum Schleppen, umbaun //hm// also. da als Kombinierer praktisch, für Stellnetzfischerei und (.) aber das is im Grunde genommen is das alles halber Kram. entweder machste das eine richtig oder das andere. ne, (.) und, bf=und dann gehts los dann brauchste nk- n (Stellgatten?) moto:r un: n stärkeres Getriebe: und (.) und das was (räuspern) (.) was wir (2) gemacht haben jetzt die Jahre und was mein Vadder gemacht hat das hat ja funktioniert. ne (.) und (2) ich denk schon da sollt man lieber blei- bleiben und, wenn es funktioniert //hm// was willst denn groß dadrüber, und du bist ja sowieso wenn du auf zweierlei Hochzeiten hörst bist du immer irgendwie: zu spät. ne, //@(.)@,tonlos// is ja so, ne, bevor du dann reagiert hast (3) nee (3)" (F4, paragraph 26)

visible when contrasting it with the case of F16. Although F16 also has a vessel only equipped for gillnets, after deliberation and evaluation he concludes that it would be smarter to diversify his business by adding more gear and therefore more opportunities to his vessel and business:

> *"I'm still using a gillnet vessel, (1) but I want to convert it to trawl fishing //yes// right? (.)That should also happen, (.) so that I (.) can also switch to other (1) fishing methods, right? //hm// Because if the gillnet fishing is not doing the job, then you usually get a bit more while trawling //hm// and then you can switch accordingly right? //hm// That was just a bit important to me //hm// Right?"* (F16, Paragraph 57) [67]

Both fishers show that it is technically possible to convert a vessel so that different fishing methods can be applied. The constraining factor in this respect seems to be the fishers' agency rather than structural moments or preconditions.

Marketing

While most of the fishers belong to a cooperative, which collects the catch from them and takes care of the sale, they also conduct their own marketing in parallel. This means that they take care of the sale of the fishes themselves, be it to regular customers or direct bulk buyers. The cooperatives are established institutions in the fisheries sector. For many years, they have taken over the marketing of the fishers and thus created practices that relieve the fishers of this part of the work. The fish is taken to auctions or to large fish markets, among other places. On the one hand, the revenue that fishers can achieve decreases with one or more intermediaries in the selling process. On the other hand, it is a way for fishers to sell their catch quickly and conveniently. Especially in connection with the cooperatives, it is documented that this established structure is appreciated for its degree of organization. Fishers who sell mainly to the cooperative prefer not to deal with their catch through other channels, which are usually more laborious, even if there is more profit to be made through

[67] „Ich fahr jetzt noch nen Stellnetzkutter, (1) den ich aber noch umbauen will zur Schleppnetzfischerei //ja// ne? (.)Das soll auch noch alles passieren, (.) damit ich (.) auch mal auswF6n kann auf andere (1) Fangmethoden, ne? //hm// Denn auch wenn die Stellnetzfischerei mal nichts ist, ist es in der Regel das du beim (.) bei der Schleppnetzfischerei ein bisschen mehr hast //hm// und das dann dementsprechend auswF6n kannst, ne? //hm// Das war mir eben ein bisschen wichtig. //hm// Ne?" (F16, Paragraph 57)

other marketing channels. From that it can be inferred that the revenue is not the decisive factor in marketing for all fishers.

> *"~I only sell to the cooperative ~I take, maybe take a box with //yes// for an owner of a restaurant, if I know that beforehand, //yes// then I do that. [...] Yes, last year there were certainly a lot of flatfish, I sold about 80% to the cooperative, right. So 80% of my catch went to the cooperative in LOCATION Y //ok// and, yes. (1) The tax office is happy. //@(.)@// @(however)@, but they are happy anyway. @(.)@ Yes. (1) It's ok, e- it's f-, it's also faster work, //hm//."* (F18, Paragraph 41)[68]

In this case, the cooperative is perceived as an enabler that takes work off and works reliably. The practice of selling to the cooperative reproduces itself as long as the cooperative can come up with these services. These established practices particularly speak to the iterational dimension of agency, as fishers can apply known schemes of action, no matter how the fishing turns out.

Most fishers apply some sort of step-by-step plan in their marketing. Here mainly practical-evaluative considerations are documented, but also projective elements, which then aim at a maximum added value, which can be achieved mainly through a supra-regional sale. The marketing strategies that are situated in the practical-evaluative dimension are rather locally limited. Step-by-step marketing usually starts with local sells to walk-in customers and tourists operated from the vessel or sales to the restaurant trade. The reasons for this are attributed to the low purchase prices of the cooperatives. The fishers then fall back on these when they cannot sell their entire catch using their first method—direct marketing from the vessel.

> *"From the vessel, yes, exactly. //hm// ((clearing throat)) And if I should have more or what then, then I'll give it to the cooperative. They don't pay the proper price for it //yes// but if you do not know where to go with it, then (.) //yes// the cooperative comes into play."* (F11, Paragraph 9)[69]

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[68] „~Ich verkauf dann nur an die Genossenschaft. //~Und wenn (?)// ~Ich nehm mal, nehm vielleicht mal ne Kiste mit //ja// für n Gastwirt, wenn ich das vorher weiß, ne, //ja// dann mach ich das schon. […] Ja, im letzten Jahr warn das bestimmt, dadurch dass viel Plattfische da warn, ich schätze 80% für die Genossenschaft, ne. Also 80% meines Fangs ging an die Genossenschaft ORT Y//ok// Und, ja. (1) Freut sich das Finanzamt. //@(.)@// @(wie auch immer)@, aber die freun sich so oder so. @(.)@ Ja. (1) Es ist ok, e- es ist f-, es ist auch die schnellere Arbeit, //hm//" (F18, Paragraph 41)

[69] „Vom Kutter aus ja genau. //hm// ((räuspern)) Und wenn ich mal mehr haben sollte oder was dann, denn geb ich die bei der Genossenschaft ab. Gibs zwar nicht den Preis dafür //ja// aber wenn man nicht weiß wohin damit, dann (.) //jaa// kommt der zur Genossenschaft." (F11, Paragraph 9)

Projective elements are rather documented in the sale of the catch to supra-regional buyers, such as the large fish market in Hamburg or wholesalers from Denmark. This strategy requires the development of a project and the establishment of new schemes of action. The reliability of the buyers is as important as the profit. Through positive experiences, this practice has been established and reproduced. The possibility to sell to the EU-wide international market in an uncomplicated way can be an enabling component for this form of marketing.

> *"Because our customer, he actually only comes (1) because of our herring. Because of the roe. //hm// The roe is interesting the interesting part of the herring. //hm// Of our herring. It is so mature for spawning. And then a paste is made from the herring roe. Because the price of the herring flaps, the fillets, they don't cost any money. That is not much //hm// (.) Totally - there is a lot of money being paid. Interesting is actually only (2) the roe, so we deliver to wholesaler A //mhm// in Denmark. //yes// (1) And there we have been delivering our herring to for years and that is a reliable partner. Everything has always been correct. Were well paid, always everything- well paid, well. We were paid on time. @(.)@ //@(.)@ mhm// You don't always have that. In any case, it always went well. (.) Even with transport and everything worked out. //(2) Yes, and he only comes for the roe. (.) //mhm// Otherwise he wouldn't come at all."*
>
> (F6, Paragraph 240)[70]

The direct marketing, which is incentivized by a better price, in combination with a quota, which is perceived as insufficient, can be complemented by a refinement of the fish, such as smoking. Through this last step, an alternative marketing format based on maximum value added results in a complementary livelihood.

[70] „Weil unser Abnehmer, der kommt eigentlich nur (1) wegen dem Hering hier bei uns. Den- wegen dem Rogen. //hm// Der Rogen is interessant beim Hering. //hm// Hier bei uns. Der is so Laichreif. Und dann wird so ne Paste: da- davon gemacht von von n Heringsrogen. //ah hm// Denn der Heringslappenpreis, die Filets, die:: kosten kein Geld. Das ist nicht viel //hm// (.) Totaler- was da Geld gezahlt wird. Interessant wird er eigentlich bloß (2) der Rogen ne, Dadurch komm wir kr- liefern ja nach Großhandel A Fisch, //mhm// in Dänemark. //hm// (1) Und da lefen- liefern wir unsern Hering schon seit Jahren hin und das ein zuverlässiger Partner. Immer alles korrekt gelaufen. Wurden gut bezahlt, immer alles- na gut bezahlt, naja. Wir wurden bezahlt, pünktlich @(.)@ //@(.)@ mhm// Haste auch nich immer, ne. (1) Auf jeden Fall lief das immer gut. (.) Auch mit Abtransport und alles hat geklappt. //hm// (2) Ja, und der kommt eigentlich nur wegen dem Rogen. (.) //mhm// Sonst würde der gar nich komm. " (F6, Paragraph 240)

> *"I (.) also already do.. I acquired now a fish smoker. (1) For me it will go more in the direction that I will smoke more fish. And. Selling - brings more money, than if I (1) am on the water (.) and work. (1) Unfortunately, that's how it is."* (F10, Paragraph 19)[71]

Livelihood diversification

In fisheries research, an approach to reduce poverty amongst low-income fishers is called the "sustainable livelihoods approach" (Allison & Ellis, 2001, p. 377). Although it is mainly discussed in the context of the global south, it is applied to understand strategies of fishers who are confronted with fluctuating natural resources, as is the case in the German Baltic Sea as well. Diversification of livelihoods is one of these strategies of fishers to manage uncertainties in fisheries and possibly compensate for loss of income, which means being involved in different economic sectors (Allison & Ellis, 2001, p. 380). In this context, institutions are often discussed as enabling factors (Allison & Ellis, 2001, p. 380), but not the capability and agency of agents, as described in the following paragraph.

There are fishers who built up complementary livelihoods. They have manifold side businesses such as service trips with the vessels (supply trips, tourist fishing trips), letting of holiday cottages, or janitor services. These additional opportunities for income are connected to evaluative and projective elements of agency. When fishers are enabled through an evaluative agency, they can seek presenting opportunities, such as the requested use of the vessel as a supply ship. At the same time, they are complementary income sources, which document a rather projective agency, such as remodeling the vessel for tourists. In one case, a fisher has a full-time job in public service, which nevertheless allows him to continue fishing as his main occupation. Additionally, it was clear in the interview that he sees himself as a fisher and does not identify himself as an employee of the state. The addition of supplementary income can also be classified in the stringency of structure and agency. On the structural side, due to economic orientations and scarce resources that can bring revenue, fishers feel compelled to generate additional income, just as they feel compelled to market their fish directly. On the other hand, the plausibility for operating a complementary livelihood is based in the

[71] „ich (.) mach auch schon. Ich hab jetzt hier (.) mir noch angeschafft mit äh Fischräuchern. (1) Bei mir geht das mehr dahin, dass ich mehr Fisch räuchern werde. Und. Das Verkaufen, das bringt mehr Geld, als wenn ich (1) auf m Wasser fahr (.) und arbeite. (1) Is leider so." (F10, Paragraph 19)

realizations of projects and opportunities taken. In the following example, the state as employer is constructed as an enabling structure with many advantages for the fisher. In the comprehensiveness of his narrative, he enumerates all the advantages of the occupation that he has already claimed, while at the same time contrasting how different this world of work seems in comparison to the fishing sphere, exemplified through the narrative about his job interview. This section is presented in a little more detail here, because F12 forms a protruding example—he has another full-time job as an employee, which thus actually goes beyond a complementary livelihood. However, he perceives this employment as his secondary income.

F12: When, yes. (2) The nice thing is, with the state is involved, everything is possible, right. //@(1)@// You can, uh. (2) So. (2) Because I don't get paid overtime, and all the whole vacation, and when I add it all up, I get half a year off. (1) //mhm// [...] And, then it's like this, we still have two little children, I can take three years off per child, until they are 8 years old. //hm// (1) I Can - yes the first year- //can go on parental leave, right, yes.// The first year and take the money, and or- (1) the whole money, or two years half the money, and. (1) One can take time off. Very relaxed, right. //@(.)@// (1) Just let them know in time, (.) and then you can always stay at home for half a year. //@(.)@// @(.)@ (1) //@(.)@. Yes, that's right.// Yes, and then you can still go fishing. //@(2)@// (.) Yes. [...] I ended up there by chance.

Interviewer: How did that come about?

F12: Yes, well, as I went on a shrimp vessel at some point and. (2) someone drove the vessel he was a temporary replacement, (3) and uh: he was also at company A (1) and, he told me=yes, man. Tell me, don't you feel like doing something else? To work a little bit with us? (2) So. I don't know. I don't know. Actually I want to go fishing. Yes, we're looking for someone. Here's the address, write an application. (2) Yes. (2) I wrote an application, (2) about what I already did, (3) yes, then nothing happened for three months. (1) Or three and a half months, (2) and then I was told to come for an interview. To LOCATION D. //hm// (1) Yes. (.) There I went, with my work clothes. //@(.)@// With my blue collar. (2) w I hardly took the rubber boots @(off,)@ //@(1)@// @(but-)@ (2) Well. Dn=n. (.) Quite normally with work clothes there and then I went there. And then there are twenty people standing there, with ties and collars, (2) I thought, where did

> *you end up here? @(.)@ And then I'm in there, with the, (2) and then they sat there in a big round, and then asked me questions. [...] and then there was a message on my answering machine, //@(.)@// (.) retroactive- one hour backdated, //@(2)@// @(1)@ uh, you could start immediately @(3)@ //@(3)@// Yes. @(.)@ So. And then I started at: COMPANY A."* (F12, Paragraph 138-140) [72]

In the first section, it becomes clear that F12 knows the legal framework of his employer and knows how to assimilate it. Although it becomes apparent in the second section and also in later parts of the interview how very different this working world is from the fishing world, he nevertheless finds his way around well and can quickly access and establish new patterns of action. This is documented especially by his parental leave, which he has already taken several times.[73] Although he interprets his new employment as a *coincidence*, it is nevertheless apparent that he actively applied for the position and accordingly pursued a project.

5.1.6 Fishers' perception of their personal prospects

With respect to the future, the fishers document different social situations that they anticipate and seek to manage differently. The future is constructed primarily as constraining rather than enabling. Anticipated coping for the future is closely related to the dominant form of agency documented in the corresponding interview sections. The fishers document enabling and constraining moments from a structural as well as from the agents' perspective that they anticipate to shape their social fishing practice in the future.

While evaluative considerations in the description of entry into the fishery were already traced (cf. chapter 5.1.1.), this orientation can also be found in the fishers' consideration of the future, particularly their exit out of fishing:

[72] For the original transcript cf. App. G

[73] From a critical feminist perspective, it is interesting to note that F12 did not take parental leave to care for his children, but to go fishing. In general, it was interesting to see that the topic of work-life balance, as well as role divisions at home and during work, was addressed in many interviews. Although the fishers in these cases clearly gave relevance to these topics, it must remain a research desideratum at this point.

> *"Because I've already looked before. So I: try:- I've already looked before. (.) For something else. (.) Because I don't know if I can still physically get through this job until I'm sixty, I don't know. //hm// Because it's also quite demanding. //Because you do a lot alone. (.) //hm// (1) That's quite a lot, (.) so. And I'm getting older too, (1) I don't know, I've already looked at (.) what else you can do. Right [...] But of course I would keep the fishery still a bit open, then I would keep my small boat, //hm// and with it I can still do a bit, still continue (.) as a side business, //yes yes// I would then do that again. I would do something like that, right."* (F6, Paragraph 351 - 353)[74]

The idea of exiting the fishery is quite pragmatically tied to the physical condition of the fisher. His own physical condition is constructed as a limiting factor, but not fishing *per se*. This is further documented in the fact that F6 in principle has a desire to continue fishing, but to an extent that does not physically strain him as much. His dilemma, namely that on the one hand he wants to stay connected to fishing and on the other hand he is not sure if he is physically able to do so, is solved by the idea to do fishing as a *side business*. The changing circumstance in this case that requires the practical-evaluative dimension of agency is his deteriorating physical constitution in a physically demanding profession. This is followed by an evaluation and the question of whether known schemes of action (in this case, continuing to fish in the known way) provide a remedy or whether a new form or adaption must be pursued (in this case, changing to fishing as a side business). At a later point during the interview, F6 then documents a lack of allocative resources in form of quota for herring as a reason that might cause him to leave the fishery:

> *"If we, if they really cancel the herring completely and we don't get any compensation or any kind of compensation payments, then I know that the money I'm going to get in the year won't be enough to cover all the expenses here. Or that I, that I also have something for myself. //hm// I also want to have something. And not just to work for*

[74] „weil ich wo- Also ich: versuch:- Ich hab schonmal bl- also: schonmal geguckt. (.) Nach was anderes. (.) Denn ich weiß nicht, ob ich diesen Beruf noch jetzt so körperlich so durchstehen kann, bis ich s- ob ich se- mit sechzig das noch kann, weiß ich nicht. //hm// Weil das ja ganz schön anstrengend auch is. //hm// Denn vi- machste ja v=viel alleine, (.) //hm// (1) Das ist schon ganz schön viel ne, (.) so. Und älter werd ich auch, (1) Weiß nicht, hab ich schonmal so: (.) geguckt, (.) was man vielleicht anderes macht, oder machen kann. Ne […] Aber natürlich würde ich die Fischerei mir noch bisschen offenhalten, Dann würde ich hier: äh: mir n: mein kleines Boot behalten, //hm// und damit dann noch so n bisschen ((räuspern)) noch weiter (.) als Nebenerwerb, //ja ja// würde ich dann nochma tätig werden. Würde ich sowas machen. ne," (F6, Paragraph 351 - 353)

> *the shit here. No, //hm// (.) I'll tell myself right away, then it's over. (.) I know that one hundred percent. (.) Then I will end this."* (F6, Paragraph 359)[75]

The prospect of diminishing herring quotas does not generate projects and new designs that he can realize in the future, but underlines the evaluative dimension of agency, which makes him to consider exiting the fishery opportunistically because of the quota reduction that might come. So, on the one hand, this dimension of agency allows fishers to find a pragmatic and medium-term adaptive decision for themselves. On the other hand, it also keeps them from finding a way for a future fishery by designing creative plans.

With respect to constraints on the economics of fishing and the physical condition of fishers, the motif of perseverance is often invoked:

> *"Yeah, I'll try to keep doing that as long as I can, right? Then- //hm// when I realize that I'm only working for keeping the business running and, and I don't have anything left over, then, then I'll have to look for something else somewhere- but I wanted to continue doing this as long as possible. //ah//(3) //hm// (2) But at the moment it's all still going, you can make a living from it and yes..."* (F11, Paragraph 188)[76]

> *"Well, I still hope that I can hold out for a few more years //hm//(.) also in terms of health and that I'll be left alone for another three years."* (F20, Paragraph 197)[77]

Fishers have a large body of local ecological knowledge, which is a result of complex knowledge production, based on inherited, personal, and shared knowledge (Figus et al., 2017, p. 1). They also notice that fish catches are changing, which is also reflected in the reduced quotas. Although in many parts of the interviews the fishers reacted with animosity towards us as representatives of the Thuenen-Institute, they also expressed hope that science

[75] „Wenn wir den- wenn wirklich die: den Hering komplett gestrichen wird, und wir kriegen: keine Entschädigung oder irgendwelche Ausgleichszahlungen, dann weiß ich, das Geld, was ich im Ja:hr noch so: ranschlepp, das wird nicht rF6n, um den- um um: die ganzen Unkosten hier zu decken. Oder dass ich, dass ich für mich auch was hab. //hm// Ich will ja auch was haben. Und nich nur bloß für den Scheiß hier arbeit. ne, //hm// (.) Das sag ich mir gleich, dann is Schluss. (.) Das weiß ich hundertprozentig. (.) Dann schließ ich hiermit ab." (F6, Paragraph 359)

[76] „Joa ich versuch das so lange weiter zu machen wie das geht, ne? Dann- //hm// Wenn ich merk, dass ich dann nur noch ähm für den Betrieb arbeite und, und nichts damit übrig hab, dann, dann muss ich mir irgendwo- Dann muss ich mir was anderes suchen, aber ich wollte das wohl möglichst gern so lange weiter machen wie das geht. //ah//(3) //hm// (2) Aber im Moment geht das ja noch alles, kann man davon leben und joa." (F11, Paragraph 188)

[77] „Naja ich hoffe noch, dass ich noch ein paar Jahre durchhalte //hm//(.) auch gesundheitlich und das man mich noch drei Jahre in Ruhe lässt." (F20, Paragraph 197)

can explain dwindling quotas. At the same time, it is suggested that once the cause has been identified, a remedy can be found and thus, on the structural side, a continuation and improvement of the fishery can take place and therefore enable more fishing.

> *"And that: (.) I: am: also: still: have the opinion that it (.) that the few of us (.) who are still there (.) that sometimes, that it sometimes will be different, get better again. I think so. (.) Right, (.) there is so much research and then it has to be seen sometime, if there are reasons that it: that there is so little fish - that it is perhaps also not always only because of fishing //hm// right, that there are also other reasons right, //hm// (.) and: (.) there: (.) I don't know if they. (.) You certainly have already [heard of] all these (.) nitrate values..."* (F4, Paragraph 164)[78]

In contrast to the first constraint, where the dilemma was caused by lack of physical health, the dilemma described in the second type of constraint is caused by lack of allocative resources, such as quotas, located in fisheries management. The physical health as a constraint is therefore localized within the agents, while the financial perspective is localized in the fisheries management and thus on the structural side. At the same time fishers construct research as an enabling factor that can influence fish stocks in a positive way. Although structures in the form of fisheries management affect all fishers in the same way, the construction of these structures as enabling or constraining depends strongly on which dominant form of agency fishers document in relation to a particular conflict.

[78] „Und des: (.) ich: bin ja: auch immer noch: der Meinung dass es (.) dass es uns paa:r (.) die die da noch sind (.) uns auch irgendwann noch ne=wieder dass es auch irgendwann ma wieder (.) anders wird. und aufwärts geht. //hm// ne, das glaub ich schon. (.) ne, (.) s wird da so viel geforscht denn: muss ja auch irgendwann ma gesehn werden, wenn es Gründe gibt dass es: dass wenig Fisch da is dass es vielleicht auch nich immer nur die Fischerei is, //hm// ne, das hat auch andere Gründe ne, //hm// (.) und: (.) da: (.) ich weiß nich ob sie. (.) ham sie ja sicherlich auch schon mit diesen ganzen (.) Nitratwerten..." (F4, Paragraph 164)

5.1.7 Syntheses: typology of fishers' agency and enabling as well as constraining elements

The different orientation frames are abstracted to different social fishing practices, which can be retraced in the concept of agency. Across all categories that emerged in the cross-comparison of the cases, three dominant social fishing practices are abstracted, which are reflected in the different types of agency: iterational, evaluative, and projective patterns of action (Emirbayer & Mische 1998, p. 963). There is an interplay of the different types of agency, which depend on the different structural contexts of action (Emirbayer & Mische 1998, p. 963). For the analysis, this means above all limiting the typology to the fishing context in which it was studied and emphasizing an ideal-type description of types for which a dominant form of agency is described. The analysis showed that individual fishers do not neatly fit into one of the three agency types. They showed tendencies that show that the types need to be understood as a continuum, although they can be described and categorized according to their dominant form of agency (Table 4).

Projective agency

Fishers with a dominating projective agency were born into a fishing family and became a fisher straight after school. Their social fishing practice is closely connected to the way they manage their businesses: projective fishers develop their business with long-term strategies and plans. While they invest in different procurements that allow for a trajectory like development of their fishery, they also show personal ambitions in buying bigger vessels or diversifying their fleet as a teleological strategy. They develop long-term projects as part of a possible future, which also becomes apparent in their way of marketing: projective agency is demonstrated where fishers carry out supra-regional sales that are the results of their active search for opportunities. This also documents a focus on maximizing value. Projective fishers resemble Leaders (Creative Research, 2009, p. 113) and Prospectors (Abernethy, 2010, p. 102) in their inclination to innovation as well as their pro-active manner to solve problems and anticipate developments, demonstrating the ability to hypothesize (Emirbayer & Mische, 1998, p. 170). For this reason, a projective agency enables fishers to respond to unforeseen challenges as well and form new schemes of actions where needed. Projective agency is

documented, inter alia, in a more diversified fishery as well as the fondness of trying out new fishing gears or the establishment of a complementary source of income that generally is connected to a stronger resilience (Coulthardt, 2012, p. 6). Projective agency is associated with a future-oriented social practice, which is also expressed in the cooperation with fisheries research, since from a structural point of view, fisheries research contributes in part to both policy and fishing developments in the fishery. Projective fishers tend to be younger, which also means that they still have some years of fishing ahead of them until retirement. They do not think about leaving the fishery, if the chance presents itself, but want to continue fishing, which is characterized as having fishing ethics (Abernethy, 2010, p. 102). They tend to target different species, locating them in a fishing group with a more diverse landing profile than fishers belonging to the cod group (cf. chapter 4.1.1). All in all, projective fishers are flexible but directed in their social fishing practice. They do not have an unquestionable routine in all areas of fishing, even if they, like all fishers, have their regular daily routines. They are aware of changes and are able to accommodate them by designing projects, such as far-reaching sales strategies or the development of their fleet.

Iterational agency

Fishers with an iterational dominating agency are also born into fishing families. They relate to their being fishers as a strongly socialized process, leaving them almost no choice to have an alternative occupation. They inherit the occupation from their fathers and tend to narrate their socialization as a constraint. In becoming fishers, they are following a long tradition as well as established schemes of action. These established schemes of action are also present in their continuity to apply gillnets as a form of fishery with which they are familiar. Their social fishing practice is continuously reproduced through practical knowledge on fishing grounds and fishing practices, creating an institutionalized form of action. An iterational agency is documented especially in routines that are not reflected and serve to stabilize the ontological security system (Giddens, 1984, p. 64). The iterational agency finds an important expression in the attitude towards the application of gillnets, which is presented as having no alternative. The recurring decision to use gillnets shows that iterational fishers do not develop projects for the future that question the use of this gear until retirement. On the business side, iterational fishers maintain and stick with one species of fish rather than diversify. The fishers originating from the cod group document exclusively an iterational dominating agency, but not all

iterational fishers are found in this group. It is characteristic for fishers with iterational dominating agency to not have ever changed gear, which is reminiscent of the Follower type of Creative Research (2009, p. 116) or Defender type of Abernethy (2010, p. 105). Fishers with a dominating iterational agency want to continue fishing as they do until they are retired and are reluctant to change, but rather continue to routinize practices in several areas of their fishing practice. During the interviews, all sequences about the everyday working and fishing process were told with an iterative narrative, showing that change of the social fishing practices might not be located in the daily work practice of fishers.

Evaluative agency

Fishers with a dominating evaluative agency tend to be a balance between projective and iterational agency. On the one hand, they may develop plans for the future through momentary impulses, based on what their current starting position is. On the other hand, after deliberation, they may also choose to fall back on already established patterns of action. These fishers were also socialized in a fishing family, but most did not start fishing immediately after school. According to their dominating evaluative agency, they have chosen a different profession first and followed their male family members into fishing later. The change of profession is tied to emerging ambiguities, dilemmas or demands (Emirbayer & Mische, 1998, p. 971). These could have been exogenous or endogenous drivers, such as the death of a family member, current unemployment, deteriorating health, or dissatisfaction with the previous employment. In changing profession, they develop new schemes of actions and follow goals in sight. The entry into fishing is then most likely accompanied by a key experience that only then finalizes their decision to stay in fishing—for example, the experience of the first fishing trip. In the case of F9, as documented above, his considerations to leave the fishery document problematizing and ambiguities and how at the end of the contemplating process he decides to continue fishing, because he is *too old* to change profession and *really* enjoys fishing. Evaluative agency does not only appear in the professional biography of fishers, but also in their business strategy. An evaluative agency is connected to opportunistic and provisional practices, which can show in the opportunistic acquisition of vessels or the trying out of new gear. Furthermore, it is present in deviant behavior such as the decision to divert to illegal fishing in order to compensate a diminishing quota. When a diminishing quota is

problematized, the situation needs to be interpreted anew with a situationally based judgment (Emirbayer & Mische, 1998, p. 994). As opposed to fishers with a projective agency, evaluative fishers do not make long-term plans and have a solution ready by the time the quota is decreased. In exercising deviant practice, actors subvert the logics of an established order and break the rules as a reaction to constraints (Emirbayer & Mische, 1998, p. 1001). Evaluative fishers resemble projective fishers, inter alia, in their ability to diversify their target species or their willingness to try alternative gears, depending on the right framework. At the same time, they resemble iterational fishers by remaining mostly in the gillnet fishery, even if they have tried other techniques. An exception seems to have been weirs—big fishing traps. Nevertheless, weirs are not newly adapted gears, but for some fishers, weirs are as established in their fishing practice, just as gillnets are.

Table 4: Summary of the characteristics of different fishers' agencies (adapted and extended from Barz et al., 2020, p. 4)

	Projective	***Evaluative***	***Iterational***
Professional biography	Started fishing as a child, became a professional fisher straight after school – professional inheritance I	Did another qualified job before becoming a fisher - professional inheritance II	Started fishing as a child, became a professional fisher straight after school – professional inheritance I
Time-orientation of actions	Actions and narratives are oriented towards the future, sets goals for the future	Actions and narrative are oriented towards the present, sets goals in sight	Actions and narrative are oriented towards the past
Decision-making	Anticipative, sets goals in (medium-range) future	Evaluates present situations, finds quick and unproblematic solution	Relies on well-established schemes of action, which he retrieves according to the situation at hand
Openness towards new forms of fishing	Is interested in trying new ways of fishing, intrinsic motivation	If the opportunity presents with the right framework, will most likely try new gear, but not from entirely intrinsic motivation	Less likely to establish new routines or practices; relies on gillnets, which they have learned about and established throughout their fishing experience
Plans for the future	Long time	Optimizes current situation through new schemes of actions or plans to leave fishery	Wants to continue fishing in familiar ways, which sometimes means he has no concrete plan of how to make a living of fishing
Target species	Diverse	Diverse	Specialized, mostly in cod
No. of fishers with dominating agency form	4 (F12, F18, 19, 21)	15 (F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F14, F15, F16, F17, F22)	3 (F11, F13, 20)

Enabling and Constraining elements for social fishing practice in the context of agency

Going back to structuration theory, the concept of structures as complexes of rules and resources that limit social practices, while also enabling them, implies a concept of action controlled by structure. In that sense, the specific implementation of social constraints matters, such as expected normative behavior with a high binding character or the unequal distribution of resources as well as the use of available leeway. In this respect, actors are active agents who have the capacity to act and have different means of actions in the pursuit of their interests and goals when dealing with social constraints (Schallnus, 2006, p. 61). With the application of the concept of agency as an analytical category, it is made apparent how different fishers interpret the leeway structures given to them and how differently they deal with social constraints, such as quotas. In this form of categorization, it is clear what agents are constructed as enabling as well as constraining to their social practice, depending on their type of agency. In the following paragraph, these enabling and constraining moments, as construed by fishers and as reconstructed by the analysis, are summarized.

Resources are generally enabling factors for the production and reproduction of social fishing practices. Authoritative resources as the capacity to organize self-development and life chances (Giddens, 1984, p. 258) are present in the projective form of agency, allowing fishers to make and realize long-term plans. In connection to the organizing of life chances, actors address their knowledgeability and personal ambition as enabling. In part, authoritative resources can be found in fishers with a dominating evaluative agency as well, when they realize opportunities such as the procurement of a new vessel. Allocative resources in the form of material features as well as produced goods (Giddens, 1984, p. 258), such as a vessel and the caught fish, are also enabling. This is especially the case when vessels are passed down from father to son, so that sons do not have to make an investment when they enter the profession. Assuming that the inherited occupation is accompanied by the inheritance of various forms of resources (not only material resources such as vessels, but also non-material resources such as knowledge), this can be reconstructed as an enabling factor. As already shown, all fishers are affected by inherited occupation, albeit in different ways. In the same manner a diversification of catch as well as income sources, as they are rather found in projective and partly evaluative types, is also an allocative resource that enables social practices. As part of the post-processing in fishing, informal networks that provide unpaid help are also enabling resources, because they avoid labor costs and free up time for other

activities, such as direct marketing. Organizational structures such as fisheries cooperatives or the European Single Market are also seen as enabling factors, economy-wise. For example, fishery cooperatives allow fishers to have an outlet for their catch, relieving them of the need to pursue direct marketing while tolerating direct sales by fishers. The European Single Market enables fishers to conduct supranational sales, which expand the potential group of buyers and allow for very specialized marketing.

Constraints are located in different spheres: biological/ecological spheres and (the lack of) resources. Constraints that stem from the limitations given by natural phenomena are classified as material constraints, which are located in the material milieu (Giddens, 1984, p. 174). These include limitations imposed by the body, such as the state of health, as well as limitations imposed by the natural environment, such as fish stocks and weather. More remotely, it also includes constraints imposed by non-existent allocative resources, such as a vessel that is designed only to accommodate gillnets but cannot accommodate alternative gear. This can be accompanied by a missing or limited knowledgeability on how to operate different gear, as was often documented with iterational fishers.

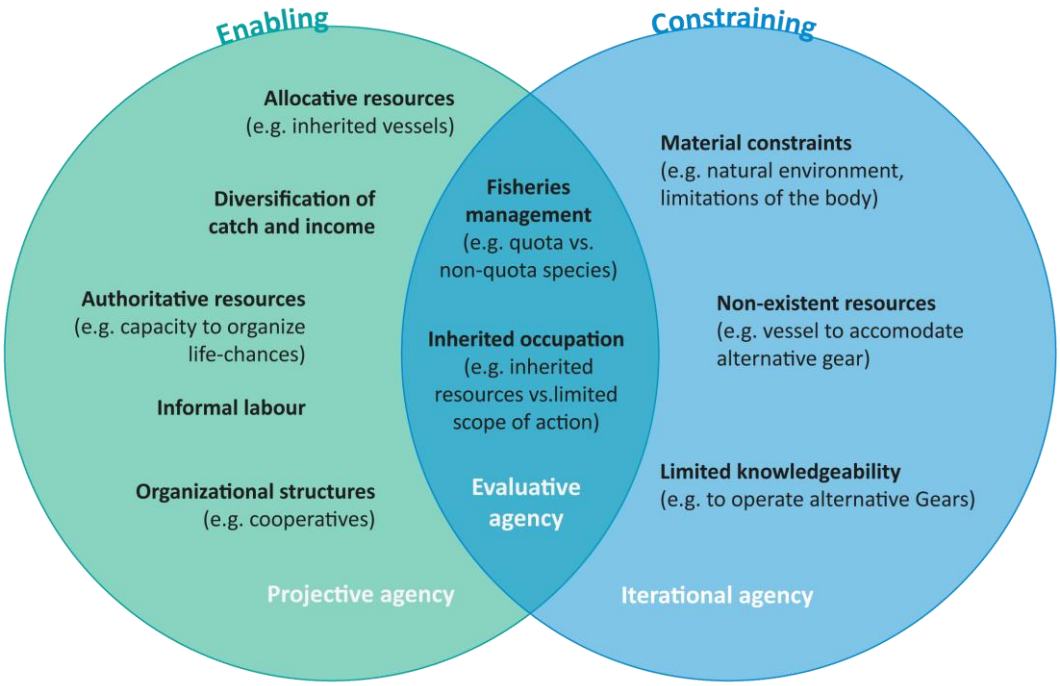
A form of structural constraints, which are rooted in the contextuality of action (Giddens, 1984, p. 176), is represented by bureaucracy.

Additionally, there are elements that enable as well as constrain, as Giddens has emphasized numerous times in his studies (Giddens, 1984, p. 25), at times depending on the dominating agency of the fishers or the concrete impact on the social fishing practice. Inherited occupation, which brings certain advantages, such as inherited resources, can also be constraining because socialization limits the scope of action and thought of actors (Giddens, 1984, p. 170). Fishers, on the one hand, perceive fisheries management as an institutional constraint with its institutionalized norms (especially concerning limiting quotas), which shapes their fishing practices substantially. On the other hand, it can also be enabling, in giving leeway to fishers for non-regulated stocks as well as room for independent practices at sea. Technically, in this case, the absence of fisheries management is documented as enabling.

In summary, enabling factors were mainly related to projective agency, while iterational types mainly addressed constraints. Evaluative types, on the other hand, are familiar with both perceptions. This became especially clear in sequences where different fishers narrated on the same topic but applied varying orientation frames that pointed to different dominant

types of agency. These corresponded to enabling or constraining narratives about elements influencing their social fishing practice (Fig. 9). It is argued that enabling factors can contribute to a transformation of social practices and thus to a production of newly formed social practices. In contrast, constraining factors contribute to the reproduction of social practices.

Figure 9: Enabling and constraining elements in social fishing practices



5.2 Bycatch practice

During the analysis of bycatch-related sequences, types of bycatch practice were reconstructed, highlighting different perspectives and mechanisms behind a normalizing and a non-normalizing bycatch practice.

5.2.1 Normalization of bycatch

The social construction of bycatch as normal is produced, reproduced, and legitimized with different practices: the construction of bycatch as *Widerfahrnis,*[79] relativization, and routinization.

Widerfahrnis

During parts of the interviews when fishers talked about bycatch, they developed a narrative plausibility of bycatch events based on causative conditions. There were different forms of causative conditions, all of which place the causal conditions of bycatch on the side of the bycaught animals: sick animals, bad luck, and animals in search of food. These plausibilities are all beyond the reach of fishers. Thus, they describe bycatch as something that occurs to them and not as an active action. Straub (1999) describes *Widerfahrnis* as unavailable to actors:

> "It refers to events and facts that cannot be eliminated, defeated or avoided by any countermeasures, not to mention that they could have been averted and prevented from the outset by foresight and preventive action" (Straub, 1999, p. 42).[80]

[79] An English translation can be the term "occurrence." Nevertheless, since the concept of occurrence is not as fitting as the elaborated concept of *Widerfahrnis* presented here, the German term will be applied further, unless a verb is used.

[80] „Er verweist auf Ereignisse und Tatsachen, die sich durch keinerlei Gegenmaßnahmen beseitigen, bezwingen oder vermeiden lassen, ganz davon zu schweigen, dass sie durch Voraussicht und vorbeugendes Handeln von vorneherein hätten abgewehrt und verhindert werden können" (Straub, 1999, p. 42).

The experience of *Widerfahrnis*, and with it the rejection of active involvement in bycatch, becomes evident in the following quotation:

> *"Yes, you sometimes have a bird in it [the net- FB], that's true. I agree with you there. That can't be mitigated in fishing. But I just don't know how to manage it differently."* (F6, Paragraph 128)[81]

Although *Widerfahrnis* leads to a delimitation of responsibility, there are indications that own mitigation strategies have been developed on the basis of bycatch experiences, which exposes a contradiction that is discussed later on. The development of different subtypes of *Widerfahrnis* are discussed below.

A causal explanation by fishers for bycatch lies in the behavior of the bycaught animals, which are restricted by a disease, otherwise they would not get caught in gillnets.

> *"I was somehow told - I don't know off the top of my head if this is true - at fishing school we were somehow told this by a biologist. The cormorant is actually smart, should also somehow work with sonar. That's what I got told. And so, the cormorant that we then have in the net - he should actually be sick. He wouldn't actually go into the net at all [otherwise-FB]."* (F7, Paragraph 96)[82]

The explanation of the active behavior of the animals caught in the nets is located in the ecology of the animals. Thus, it can be classified as *Widerfahrnis* on part of the fishers. The reference to the biologist and the school as a legitimate place of knowledge production and knowledge transfer strengthens and legitimizes the fisher's thesis that injured animals are caught.

Bad luck as a plausibility can occur in two different ways. For one thing, fishers are in bad luck when they have bycatch in their nets. On the other hand, bycaught animals are in bad luck, because they get entangled in nets.

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[81] „Ja, n Vogel haste manchmal dran. Das stimmt. Da geb ich dir recht. //hm// Also das lässt nun nicht vermeiden bei der Fischerei. //Klar.// Ich weiß nur nich wie: wie=wie=wie man das anders regeln soll, aber…" (F6, Parapraph 128)

[82] „Ich hab mir irgendwie sagen lassen, ich weiß nich aus m Kopf obs stimmt, auf der Fischereischule hatten wir das irgendwie: von ein: Biologen, so erklärt, der Kormoran is ja eigentlich sch- ä schlau, soll auch irgendwie: ähm ähm mit Sonar wohl irgendwie (.) arbeiten. So hab ich mir das sagen lassen. Und die wir dann a äh: vom Kormoran, die wir im Netz haben, der müsste (1) ja, also, n eigentlich krank sein. Der würde *[sonst-FB]* eigentlich gar nich ins: ähn Netz gehen." (F7, Paragraph 96)

> *"You can have bad luck. Imagine that you really have bad luck, that you really have your nets full of birds, right. [...] How will you-? You can have bad luck sometimes. You can really put your nets in such a flock that so many get caught there. Or you can have bad luck sometimes, that more are stuck on it. Could also be sometimes [the case], I do not know."* (F6, Paragraph 282)[83]

In this case the narrative focuses on the human aspect of bad luck. Fishers are in bad luck if they have bycatch. This can be plausible for several reasons. On the one hand bycatch influences the yield in a negative way, but on the other hand, the narrative indicates that bycatch is reconstructed as socially undesirable behavior by the fishers themselves. It is thus part of their mutual knowledge. In the following section the same fisher refers to a study on bycatch, which was conducted with cameras and in which a colleague participated. The colleague had at least 20 seabirds as bycatch in his gillnet right at the beginning of the study. This circumstance is literally referred to as *bad luck*. This also confirms the second reading—the mutual knowledge of socially undesirable behavior—that was witnessed by the camera at this point, which was again *bad luck*:

> *"Somehow then at the beginning of the study, that had been done with the camera and then a colleague had just - that was just very sad - he had twenty birds on it, right. It was really quite a lot of bad luck, right. So, he had set the net and has seen no seabirds there before and then he has had twenty there on it, right. Or more? I don't know anymore*[84]*. No, it was more. No, but - you can have bad luck, right. You immediately get - if I would now say a hundred or what do I know [...]. Anybody can - you can be unlucky, you can have a few more or I don't know."* (F6, Paragraph 282)[85]

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[83] „Du kannst ja mal Pech haben. Stell dir mal vor, du hast ma wirklich Pech, dass du wirklich deine Netze voll hast mit F- mit mit mit mit ä mit Vögeln ne. […] Wie willst-, kannst ja auch mal Pech haben. Da kannste wirklich mal w:- in so n Schwarm da (.) deine Netze, dass da so viel verfeng- verfangen sich. Oder kannst ja auch mal Pech haben, dass ebend mehr mal dran sitzen. Kann ja auch mal sein, ich weiß das nich." (F6, Paragraph 282)

[84] The addressed bycatch event occurred during a study, which detected 60 bycaught seabirds during the first week of the study from a total of 86 bycaught seabirds in one year (Oesterwind & Zimmermann, 2013, p. 35). The first week and the high number of bycaught seabirds therefore seems to be an atypical event, which plausibilizes the fisher's description of *bad luck*.

[85] „Irgendwie dann zum Anfang der Studie, (1) wie: mit der: Kameras das gemacht w=worden und da hatte auch ein Kollege dann ebend, das war (.) ebend sehr traurig, da hat der zwanzig Stück dran gehabt. ne:, War wirklich: ganz schön viel Pech dabei. ne, also. (.) Hatte gesetzt, hat da vorher keine Enten auch nich da gesehen, und dann (.) hat er zwanzig Stück da dran gehabt ne. Oder mehr? Ich weiß es nicht mehr. (.) //hm// War aber ne, warn aber mehr. Ne, aber. (3) Kannste Pech haben. Ne. //hm// Haste gleich, wenn ich jetzt hier sagen würde hundert Stück oder was weiß ich […] da kann ja jeder- kannst ja ma Pech haben, n paar mehr haben oder was weiß ich ne. (2) Ich würd da, weiß ich nich." (F6, Paragraph 282)

In contrast to the narrative of unlucky fishers there is the narrative of unlucky animals.

> *"It often happens that a cormorant or something like that dives in and at this length, kilometers long, it finds a net and then it has bad luck. That's just the way it is."* (F20, Paragraph 56)[86]

The explanation of why harbor porpoises become bycatch in gillnets is described in detail by F9. Bycatch happens to the animal because it follows its natural instinct and is in search of food. This drive is described as strong enough so that the harbor porpoise does not even notice the protective devices, such as pingers or PALs. From his detailed description it can be inferred that he observed the event himself and derived his interpretation from it.

> *"Yes, the porpoise swims, for example... it goes to the meshes, whether there are pingers hanging there or not - it's not interested at all, it wants food. Just as the seal does. It [the porpoise-FB] goes there, sees a fish in it, it's an easy prey, and wants to have it. And when the porpoise arrives, with its snout, it pulls the [fish-FB] out and has it. And he wants to swim away. And how does the porpoise swim, when it swims away? He takes the [fluke] and goes up like this. He can't go down, because there's the bottom. So he goes up. And then his problem is that the fluke goes into the back of the net. And through the fluke he can get unlucky, just through the fluke. It [the porpoise] doesn't go into the net. It doesn't swim into the net. It's in the back, his fluke. If the fluke goes in the back, then it's stuck. And seals swim backwards. […] no problem for them. And the harbor porpoise doesn't. That's his problem. Whether there is a beeper attached to it or not, it doesn't give a damn, it wants the food, it's hungry. That's the way it is with animals."* (F9, Paragraph 75 - 77)[87]

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[86] „Es kommt immer mal vor das dann noch äh:: so ein Kormoran oder irgendwie was da taucht so und //hm// auf diese Länge, kilometer Länge (.) da findet der mal nen Netz und dann (.) hat der Pech. //mhm hm// (2) Dat ist eben so." (F20, Paragraph 56)

[87] „ja also äh=w=ä=de der Schweinswal schwimmt zum Beispiel der geht andi=andi=an die Maschen bei (.) ob da nu Pieper dran hängt oder nich das interessiert //hm// den gar nich, der will, die Nahrung haben. //hm// so wie, der Seehund das auch macht oder die Robbe. //hm// der geht da bei sieht da n Fisch drin, is ja ne einfache Beute und will den ha:m. (.) und wenn der wenn=der=der Schweinswal äh kommt an, mit der Schnautze, zieht den raus oder will den ham. und der will ja wegschwimmen. (2) n wie schwimmt der Schweinswal wenn er wegschwimmt? //tja// (3) ~ eh nimm den und geht so hoch. so er kann ja nicht runter gehen weil da ja der Grund is. also geht er hoch. und denn sein Problem is, die Flunke hinten geht in Netz rein. //ja// und durch die Flunke, kann er pech ham //tüdelt er// nur durch die Flunke. der geht nicht in Netz rein. der //ok// geh- der schwimmt nich Netz rein es is //ja// hinten sein=seine Flunke. wenn die Flunke hinten rein geht, denn isser fest. //hm// und der Seehund, der schwimmt rückwärts. (.) //hm okay// der Seehund o d Kegelrobbe gehn rann und rückwärts, kein Problem für die. und der Schweinswal macht das nich. (2) das is=ses sein Problem.=ob da nu n Pieper dran hängt oder nich, //hm// das is scheißegal, er=er=er will die Nahrung ham, er hat Hunger, //hm// (.) das is mit Tieren so." (F9, Paragraph 75 - 77)

The last paragraph in particular illustrates that the harbor porpoise is assumed to have an animalistic goal of its own, which the fisher cannot influence. The focus of the narrative in the context of this subtype of *Widerfahrnis* is to present the chain of events in a plausible way and to show the lack of possibility of one's own action to mitigate it.

Although *Widerfahrnis*, as opposed to an active social practice of bycatching, is ostensibly narrated during the interviews, the interviewed fishers also construct a counter-horizon, a form of othering, of fishers who in their opinion intentionally perform bycatch actions in taking a high risk while fishing near seabirds. During the interviews, fishers distinguish themselves from these *no normal persons and idiot* fishers and are therefore normalizing their own behavior, even though bycatch occurs to them as well.

> *"And then I have to say, and first of all, whoever fishes for seabirds, does something like that in these... - everything really has to be taken away from him. That's a huge mess. You see the birds swimming around there. You don't have to set your nets there. You don't do that. But there are always idiots."* (F9, Paragraph 79)[88]

> *"And that is - these bird areas are well known, (.) we know them ourselves, where most of them [the birds - FB] are //hm// and no normal person goes there anymore, because there are no fish there either.*" (F20, Paragraph 56) [89]

It is assumed that fishers who set their nets in known bird areas are *not normal*, respectively *idiots*. *You don't do that* implies an unspoken rule between fishers. It can be reconstructed as part of their mutual knowledge directing social fishing practices. It also reflects socially desirable behavior that fishers then adopt as their own, but cannot always live up to. None of the interviewed fishers spoke of an active practice that they conducted themselves when talking about bycatch. However, they did refer to *other* fishers, who in their opinion actively risk bycatch (the behavior they attribute to *idiot* fishers). However, since this occurred only as part of an *othering* process from the interviewed fishers, this subtype can only be reconstructed as a counter-horizon and not as a type of its own.

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[88] „und da muss man dann sagen, (.) und erstmal (.) wer auf Enten fischt, sowas macht da in diesen- den muss wirklich alles entzogen werden. (2) //hm// das is ne riesen Sauerei. du siehst die Viecher da rumschwimm da muss man ja auch nicht aussetzen. //hm// das macht man nicht. aber es gibt immer Idioten. //hm//" (F9, Paragraph 79)

[89] „und das ist diese Vogelgebiete das ist ja bekannt, (.) die kenn wir ja selber auch wo am meisten sitzen //hm// und da fährt kein normaler Mensch mehr hin, weil da auch keine Fische mehr sind. (F20, Paragraph 56)

Relativization

Another mechanism for normalizing bycatch is putting it into perspective and therefore relativizing it. Putting bycatch of seabirds into perspective often goes along with references to the past. During relativization fishers document a rather iterational agency where known schemes of actions are recited, inter alia by repeated references to the past (Emirbayer & Mische, 1998, p. 971). On the one hand, more birds were caught in the past and therefore the quantity of today's bycatch is seen differently by fishers who experienced how seabirds were caught in the past, or who have been told about it by their older family members. Whether a decreased number of bycaught seabirds is due to a decreased number of birds in general or due to different fishing practice, however, is not addressed. On the other hand, there used to be legitimacy for (by)catch of seabirds, so the quality of consumer discourse was different. Birds used to be livestock, caught intentionally by fishers and sold as food. Nowadays, this takes place only unofficially and has no place in the public sphere.

> *"Look, we were one thousand two hundred fishers in GDR times. The birds that were caught there can't even be compared to today's numbers. It happens sometimes, it can't be avoided at all."* (F15, Paragraph 39)[90]

> *"If, for example, we had a storm, and we set out a gillnet on the coast, then it can happen that two eider ducks get caught in it. So. Of course you have to be honest, that that's the case. But, these are no longer these quantities that they have shown on television. In former times."* (F7, Paragraph 96)[91]

> *"I will never forget that. There were so few cod - it must have been in like the 70s - that my father said - Don't write that in the newspaper now- [...] I mean that is, he is yes, he is time-barred. That he said: then we had, then we had a hundred ducks. In the nets. And people still ate the ducks back then. And then he said: four boxes of cod - that's not great. But we still had a hundred ducks. A piece goes for one German mark. And then,*

[90] „Guck mal wir waren zu DDR Zeiten tausenzweihundert Fischer. (.) Was da an Vögeln gefangen wurde, das kann man doch mit den heutigen Zahlen gar nicht mehr verglF6n. (.) Das passiert schonmal, das lässt sich gar nicht vermeiden." (F15, Paragraph 39)

[91] „wenn=ma zum Beispiel Sturm hatten, und legen an der K:üste Stellnetz aus, dann kann das mal sein, dass dann da ma zwei (.)Eiderenten drinne sich verhaken. (1) So. Da muss man natürlich halt ehrlich sein, dass eh, das is so. //hm// Aber, das sind nich mehr diese Mengen, was sie da im äh Fernsehen gezeigt haben. Früher." (F7, Paragraph 96)

> *ducks and cod, that was another day's pay. Yes. Tell that today. Then all hell breaks loose."* (F5, Paragraph 124)[92]

This historical justification of seabirds as livestock thus still determines the current hegemonic discourse around seabirds on the fishers' side. When animals are classified as livestock, this classification determines what behavior towards them is considered legitimate by society (Buschka et al., 2012, p. 22). Therefore, the lower degree of scruples shown towards bycatch of seabirds can be due to their classification as livestock in earlier times. The last sentence, *then all hell will break loose,* from F5 again documents where fishers locate today's discourse on bycatch of seabirds and their use as possible livestock. He uses dramatic words to describe possible consequences of bringing normalized bycatch of seabirds back into the public sphere. Visible results of bycatch events and bycatch practices are socially undesirable and would lead to a public outcry.

Routinization

For fishers that document a routinization of bycatch, having bycatch is narrated as a regular part of the everyday fishing life. Although fishers hardly ever talked about a specific quantity of bycatch, it became clear that bycatch of seabirds and the handling of it has a part in their professional routine. Routine is characterized by the repetitive character of practices and is seen as opposed to critical situations, which break routines (Giddens, 1984, p. 41). During the interviews, routinization is documented in passages where fishers do not narrate a singular event nor do they narrate a critical situation or where they generalize their own experiences and transfer them to other fishers.

> "*Nobody can tell me that they didn't have a duck once with them, that's nonsense."* (F3, Paragraph 126)[93]

[92] „Das werd ich nie vergessen. (.) Da warn so wenig Dorsch ä (1) Das war- muss in der 70er Jahre so gewesen sein. //hm// (1) Dass mein Vater sagte, (.) ich w- dass db- Schreib das bloß nich in die Zeitung. //F@(1)@// //@(1)@ ~auf gar kein Fall.// Ich mein das is, er is ja, er is ja verjährt. (.) Dass der sagte, dann hatten we-, dann dann hatten wir noch hundert Enten. (1) In den Netzen. (1) Und da haben die Menschen die Enten noch gegessen. //hm// (.) Und dann hat der gesagt, ba vier Kisten Dorsch, (.) da is ja nich doll, (.) aber hatten wir noch hundert Enten. Stück ne Mark. (1) Und dann, Enten und Dorsch, dann war das doch noch ein Tag Lohn. (.) //Naja.// Ja. Das erzählen Sie mal heute. Dann is der Deuvel los." (F5, Paragraph 124)

[93] „Mir kann keiner sagen das er mal keine (.) Ente mit hatte, das ist Quatsch." (F3, Paragraph 126)

> *"It often happens that a cormorant or something like that dives in and at this length, kilometers long, it finds a net and then it has bad luck. That's just the way it is."* (F20, Paragraph 56)[94]

> *"It happens, right? Seabirds, porpoises, everything just happens, right? That's just the way it is. Sure it happens - that always sounds stupid."* (F16, Paragraph 108)[95]

Fishers illustrate that they have developed strategies on how to handle bycaught seabirds. Strategies vary from throwing the birds back into the sea or taking them home to eat them. The social practices of handling bycatch are not located in the public sphere. On the contrary, it remains hidden and tied to the workspace of the vessel or the private home.

> F3: *"I pluck them and then I bash them into a pan and in a pot (laughs) and then~."*
> Interviewer: *"Really?"*
> F3: *"Yeah sure."*
> Interviewer: *"Does it taste good?"*
> F3: *"[…] Yes, eider duck tastes good, the breast. They used to sell them we fished for them specially. […] Yes, yes, we got, we got for the eider duck we got three German marks, they were sold here in the fish stores."* (F3, Paragraph 28-34)[96]
> F20: *"That's, that's quite normal, he swam in there, is dead and…"*
> Interviewer: *"What do you do with it then?"*
> F20: *"Yes, throw it away again. What should I do with it?"*
> (F20, Paragraph 52 - 54)[97]

[94] „Es kommt immer mal vor das dann noch äh:: so ein Kormoran oder irgendwie was da taucht so und //hm// auf diese Länge, kilometer Länge (.) da findet der mal nen Netz und dann (.) hat der Pech. //mhm hm// (2) Dat ist eben so." (F20, Paragraph 56)

[95] „Kommt vor, ne? Seevögel, Schweinswale bleibt alles nunmal nicht aus, ne? //hm// Das ist einfach so. (2) Klar passiert, das klingt immer doof…" (F16, Paragraph 108)

[96] F3: „@Die rupf ich und dann hau ich mir die in ne Pfanne und in Topf@ und dann~"
Interviewerin: „Wirklich?" - F3: „Ja klar. ((Hund belt))" - Interviewerin: „Schmeckt das?" - F3: „[…] Ja, Eiderente schmecken gut, die Brust. //hm// Früher wurden die verkauft (.) haben wir extra nach gefischt. […] Jaha (.) jaha: da haben wir, haben wir (.) für die Eiderente haben wir drei Mark gekriegt, (.) die wurden hier in den Fischläden verkauft." (F3, Paragraph 28-34)

[97] F20:„Das ist, das ganz normal, der ist da reingeschwommen ist tot und (.)" - Interviewerin: Was machen sie dann mit dem? - F20: Ja wieder wegschmeißen. //hm// Was soll ich damit machen? " (F20, Paragraph 52 - 54)

> *"And these things [the porpoises-FB], we have - because it's embarrassing, no one wants them – we put them back in the water. Well, most of the time you have to cut off the fluke, because they are so twisted in [the net-FB] with the fluke that the... You can't get them out like that, right. You know, they entangle in the net and then they try to free themselves, of course, and then they get twisted up."* (F17, Paragraph 15).[98]

Even though routinizing narrative is mainly used in connection to seabirds, F17 presents a routinized handling of bycatch of porpoises as well. *Most of the time* indicates a strategy that has been applied more than once and is used to describe routine practices and not singular events. One can also see ignorance in the presented quotes, because fishers are unsure about what should or should not happen to the animals they accidentally catch.

Although bycatch incidents should be reported, by not reporting them, fishers document how they perceive the public discourse on bycatch and reproduce the discourse as unwanted and deviant behavior. It again emphasizes the localization of bycatch in the private sphere, although it is asked of the fishers to localize it in the public sphere.

> F11: *"Yes, as I said, uh puh I also had something like that in the nets, yes. Normally, you have to, you have to register the, that right? That you have something like that in the net. So, I haven't done anything like that."*
>
> *Interviewer: "And what do you do?"*
>
> F11: *"I let them go right back overboard then."*
>
> Interviewer: *"Yes."*
>
> F11: *"Was dead, right? And yeah."*
>
> Interviewer: *"And then?"*
>
> F11: *"Well, then you go on with your work. (laughs) It's no use."*
>
> (F11, Paragraph 49 - 55)[99]

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[98] „Und diese Dinger, die haben wir weil es peinlich is, die will kein Mensch haben. Lassen wir die wieder (.) zu Wasser. (.) //hm// (3) Naja. Meistens muss man die Fluke abschneiden, weil: die (.) sind so eingedreht mit der Fluke, dass die:. (2) Die kriegste so nicht raus. Ne. Weißt du, die haben das Netz und dann versuchen die sich natürlich zu befreien und dann, drehen sie sich im Argen." (F17, Paragraph 15)

[99] F11: „Ja wie gesacht, äh puh ich hatte auch schonmal sowas in den Netzen drinne ja. Normalerweise muss, muss man die, das ja anmelden nä? Das man sowas in den Netzen hat. (.) Also ich hab sowas nicht gemacht. //hm// also-"
Interviewerin: „Und was machst du denn?"
F11: „Hab die denn gleich wieder über Bord dann (.) gehen lassen."
Interviewerin: „Ja."
F11: „War ja tot, ne? Und joa."
Interviewerin: „Und denn?"

Fishers go on with their daily work after they have taken the bycatch out of their nets. The event itself is not described as a critical situation that breaks their professional routine, but rather an event that asks for strategies that are established. This habitual character of, for example, throwing the animals overboard helps to produce and reproduce bycatch as part of a routine and therefore normalize it. A routinization of bycatch events can also explain why no fear and guilt were expressed in the corresponding parts of the interview, because in a structurational sense, routines based in the ontological security system control possible fear and guilt (Loyal, 2003, p. 55). As Giddens (1984) explained, routinized practices also have unintended consequences (p. 293), which is later referred to in the context of the stratification model of bycatch practice (cf. 5.2.4.).

The different variations of plausibility reflect assumed ecological knowledge (captured animals are sick or follow their urge for food) and the assumption that bad luck or chance are responsible for bycatch events. They show at the same time a distancing and powerlessness towards the bycatch event. This may be due to the awareness that bycatch is socially undesirable. Faced with the task of reporting on bycatch events, fishers feel called upon to find explanations, justifications, and rationales for the events, while at the same time emphasizing that it is a matter of *Widerfahrnis*. Plausibilities are therefore anchored in the ecological sphere. Based on fishers' construction of bycatch as *Widerfahrnis*, a practical problem for actor-centered bycatch mitigation becomes apparent: while fishers consider bycatch to be uncontrollable, this research assumes—from an application-oriented perspective—that fishers' behavior can be influenced in favor of bycatch mitigation. Thus, an expectation of controllability prevails that is not shared by fishers.

The plausibilities shown above, which contribute to the normalization of bycatch events, can only be theoretically separated from one another.

F11: „Joa dann, dann macht, macht man seine Arbeit weiter. @.@ Nützt ja nichts."
(F11, Paragraph 49 - 55)

5.2.2 Non-normalization of bycatch

While on the one hand bycatch of mostly seabirds and occasionally marine mammals can be integrated into a routine, and fishers have developed habitualized strategies for it, bycatch events of porpoises are usually narrated as critical, unlike bycatch of seabirds. Critical situations are events characterized by a radical, unpredictable rupture that affects a significant number of individuals and threatens or destroys the certainty of institutionalized routines (Giddens, 1984, p. 61). In critical situations predictable routines are shaken, which threatens the ontological security system of agents (Giddens, 1984, p. 41). "The 'swamping' of habitual modes of activity by anxiety that cannot be adequately contained by the basic security system is specifically a feature of critical situations" (Giddens, 1984, p. 50).

Even if bycatch events of porpoises occur more often, they are narrated as singular events and present characteristics of critical situations. Fishers' ontological security and routine are particularly ruptured, when calves are involved in bycatch events.

> *"I can remember other years and then one has also really, yes. You had one more often. Also, a small one with it, and that...Yes. It's not nice at all. No, when the mother's milk runs out of its mouth, it's- you don't want to see it. You don't want to. But yes, what do you do. Right, and... I also see a problem, I have no idea if a mother with her...toddler, with her little one following, actually swims around and there is a net, if the little one then actually passes by. Right, I don't know, or [if it] evades."* (F18, Paragraph 145)[100]

[100] „Ich kann mich da an andere Jahre erinnern und dann hat man auch wirklich, (.) ja. (.) Haste öfter mal einen gehabt. noch mal n kleines Tierchen dabei, und=das: (.) Ja. Es is überhaupt nicht schön. //hm// Ne, (.) Wenn die Muttermilch aus m Maul läuft, is- wills will man nich sehen. //hm// Will man gar nicht. Aber (.) ja, was machst du. Ne, und. Das da seh ich auch noch n Problem, ich hab keine Ahnung, ob ob so n (1) Wenn tatsächlich ne Mutter mit mit ihrem (.) Kleinkind äh mit mit ihrem (1) Kleinen (1) äh (.) Gefolge da (.) drumschwimmt //hm// und da kommt n Netz, (1) ob das Kleine dann tatsächlich dann vorbei geht. Ne, das weiß ich nicht. //hm// Ne, oder ausweicht." (F18, Paragraph 145)

> *"It's different with with, with, with porpoises and with with things. So that is- I have to say quite honestly, I had once, I had once two small ones and one big one in a gillnet, pretty close together. That kept me busy. So that-, I did have a bit of - well I dreamt of it."* (F17, Paragraph 35) *[...] "This (2) bad conscience, if one has bycatch nevertheless, which haunts one, a bit, right. If the eyes of the small porpoises look [at me]."* (F17, Paragraph 317)[101]

Fishers approach the event with empathy and humanize the captive animals using terms that are usually only used for humans in everyday language (*mother's milk, toddler*). F17 has a *bad conscience* in relation to the bycatch event. He cannot suppress the event from his memory. According to Giddens (1984) this is because suppression as part of the human consciousness works to a limited extent (p. 92), which is why the bycatch appears in a dream of the concerned fisher.

> *"So it also happened in the, in the warm years, I'd say, about over ten times per year. And that's a lot, of course. And, and frightening, right. When you, when you have two in one day. I once had a seal - that was - I can remember it. I think even two porpoises and a seal in one day."* (F18, Paragraph 167)[102]

The bycatch experience is perceived and classified as *frightening*, although it has a certain commonness with a frequency of 10 times a year. However, the subjective *frightening* experience can also be triggered by several animals being caught in one day (such as two porpoises and one seal in this example). Such events could be considered to be particularly memorable and are therefore not part of a routine. Thus, porpoises are more likely to be charismatic animals (Campbell & Cornwell, 2008, p. 326) whose bycatch triggers a critical situation, which is not documented in the case of seabirds.

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[101] „Anders verhält sich das mit mit mit mit Schweinswaln und mit mit Dings ne, d-. Also das is- (.) Ich muss ganz ehrlich sagen, ich hatte mal:, ich hatte mal (2) sch- zwei Kleine und n Großen, auf einem Netz, ziemlich dicht beieinander. Das hat mich beschäftigt. Also das-, da hab ich doch n bisschen (2) naja. Von geträumt." (F17, Paragraph 35) […] „Dieses (2) schlechte Gewissen, wenn man doch ma (2) Beifang hat, der ein so n bisschen verfolgt. (.) ne. Wenn die (2) Augen von den klein Schweinswaln ma gucken. " (F17, Paragraph 317)

[102] „Also es kam auch in den, in den warmen Jahren, sag ich mal, auch mal über zehn pro Jahr. //hm// Und das is natürlich viel. (1) //hm// U:nd (1) und erschreckend, ne. Wenn du, wenn du zwei an einem Tag hast. Ich hab (.) eine Robbe, ohr das war, ich kann mich dran erinnern. (2) Ich glaube sogar zwei Tümmler und eine Robbe an einem Tag. " (F18, Paragraph 167)

5.2.3 Bycatch mitigation practices

It has been shown that bycatch is something that fishers classify as *Widerfahrnis*, that is partially normalized and therefore part of a routine, which produces and reproduces structures in which bycatch practice can take place. However, at the same time mitigating behavior is narrated as an active practice to avoid bycatch because fishers do not intend to have accidental or intentional bycatch.

> *"It's not like we're killing these birds on purpose." (*F3, Paragraph 126)[103]

As opposed to *Widerfahrnis*, bycatch is now referred to as an act of killing, something actively done—in this case to underline the rationalization behind the need for mitigating strategies. At the same time, the intentionality behind the act of killing is denied. In this respect, the narration of *killing* is more in the tradition of *Widerfahrnis* than in the tradition of an active social practice.

> *"If I don't want it [bycatch-FB], then I won't get it - and I don't want it."*
> (F4, Paragraph 66)[104]

During the interviews, fishers presented different strategies that they apply actively to avoid bycatch. In the following there is more detail on where these mitigation strategies are localized and how they are practiced. However, it will have to remain a research desideratum how the ambivalence of *Widerfahrnis* on the one hand and the application of active mitigation strategies on the other hand can be explained or resolved.

The reasoning behind bycatch mitigating practices is placed in an economic sphere, in terms of labor efficiency and lost revenue. If birds are entangled in gillnets, the nets break and are no longer able to catch fish. The goal of bycatch mitigation can thus be reconstructed as a by-product of an economic orientation.

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[103] „Wir töten ja nicht absichtlich sonne Ente." (F3, Paragraph 126)

[104] „Wenn ich das nich will, (.) dann kriech auch kein. //hm// (.) und ich will sie ja nich." (F4, Paragraph 66)

> *"If you have a bird with you, then you take it with you. It sucks - your net is broken and everything...because nobody wants to - we don't kill a bird on purpose. Right? But I don't burst into tears (laughs) but that is not nice because the net is broken, right?"* (F3, Paragraph 26)[105]

On the one hand, the economically detrimental nature of bycatch of seabirds becomes clear, while on the other hand the plausibility of bycatch-mitigation behavior is narrated. From an economic perspective, it is logical for fishers to avoid bycatch in order to not destroy their nets and not to reduce the catchability of the nets. At the same time, untangling birds is labor intensive, which leads to another level of economic orientation of bycatch mitigation: economic orientation in terms of reducing effort, not losing time, and not wasting labor.

> "*It's all bullshit. You don't set your nets where the ducks are. Because then you won't be able to finish. You'll have ducks all over the place. Yes, it's all nonsense – bycatch of seabirds.*" (F14, Paragraph 88)[106]

The economic perspective can be reconstructed in many cases and thus seems to be the main plausibility for bycatch avoidance. In other places, the perceived public opinion as guiding action for bycatch behavior has already been discussed. In this context, however, it relates more to the cover-up of bycatch than to mitigating behavior. Although a reflection takes place (*it sucks*), the bycatch event of a bird does not trigger concern on a moral level and thus does not threaten the ontological security system, but triggers concern on a business-oriented level. Accordingly, the continuation of fishing can be reconstructed as a basic motive for social fishing practices.

In general, fishers' personal bycatch mitigation strategies and motivations were diverse. They are part of their mutual professional knowledge and result from experience, in parts from intergenerational experiences, as already shown in the process of relativization. They pursue tactical and technical strategies, as well as mental strategies, and some of them are rooted in the voluntary agreement of Schleswig-Holstein.

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[105] „Wenn du ne Ente mit hast, dann nimmst du die mit. ist scheiße, (.) hast ja Netz kaputt alles (.) da will, da will ja keiner (.) wir töten ja nicht absichtlich sonne Ente. (1) Ne? (.) Aber das ich da dann in Tränen ausbreche das ist auch nicht so @aber@ das ist nicht schön weil das Netz kaputt geht //hm// das ist, ne?" (F3, Paragraph 126)

[106] „Is ja auch alles Schwachsinn. (1) Du setzt ja nich da aus, wo die Enten sind. Weil du dann nich fertig wirst. Hast ja alles voller Enten. //ja// Is ja Blödsinn, (1) Entenbeifang." (F13, Paragraph 88)

Tactical mitigation strategies include that fishers take the probability of bycatch into consideration, when they decide where and when to fish. Part of the tactical decision is to avoid high-risk depths for bycatch of seabirds prior to fishing. Another tactical strategy is based in the voluntary agreement of Schleswig-Holstein,[107] where fishers agreed to avoid certain areas or times and reduce their soaking time. At the same time there are legally binding designated protected areas for seabirds, where fishing is prohibited, which also lead to an avoidance of certain areas.

> *"And as I said, [where there are] seabirds- nobody goes there anymore. There are bird protecting areas everywhere now from this voluntary agreement that we are not allowed to fish there at certain times."* (F17, Paragraph 35)[108]

Furthermore, based on restrictions, their own experiences and ecological knowledge, fishers know which seasons are at high risk for bycatch.

> "*The area [...] and the time. Now, during summer, I can fish on the mussel banks. And in the fall, the early fall, nothing happens there. There is no one, right. But, as soon as it becomes winter here and the water gets colder, and that. Then they just come. And then I have to avoid such areas. [That's-FB] quite clear. And every fisher does so.*"
> (F4, Paragraph 68)[109]

Additionally, a reduced soaking time and net lengths has been applied by fishers to avoid bycatch of mostly seabirds. This is also partially based in the voluntary agreement.

> *"I've done things like that, too: I set [the net] in the morning, brought it up again once, and look, here's how it works. What are you supposed to catch? Fish feeds in the morning and in the evening. It doesn't eat during the day, and it doesn't eat at night either. It only eats when the sun rises and the sun sets. When he comes to eat, then you*

[107] On a side note, it became clear during the interviews that although fishers or their representatives signed the voluntary agreement, it was not always clear to them what it contains, why it is important, and why it was signed.

[108] „Und wie gesagt, Enten, da fährt keiner mehr hin. Da sind ja überall Entenschutzgebiete jetzt von dieser Freiwilligen (.) Vereinbarung, dass wir da und da zu den Zeiten nicht fischen dürfen." (F17, Paragraph 35)

[109] „Das Gebiet und die z- und der und die Zeit. //hm// ne, (.) ä jetzt kann ich im Sommer kann ich: auf die Muschelbänke fischen und im Herbst da: (.) zum: im frühen Herbst, da passiert nix. da is keiner. //hm// ne, aber:, aber: sobald es denn zum Winter her wird und des: das Wasser wird kälter, und das (.) denn: (.) denn komm die einfach. //hm// und dann muss ich sonne Gebiete meiden. (.) ganz klar. und das macht, macht jeder Fischer." (F4, Paragraph 68)

> *catch them. That's why I put it out in the morning and bring it right back up again. Then they come! (laughs). It's a miracle!"* (F9, Paragraph 123)[110]

F9 reports that, based on his ecological knowledge, he is reducing the soaking time and therefore has a good catch with no bycatch. Another tactical measure that can be identified from the interviews is visual checks for seabird gatherings before fishing.

> *F7: "Because we see them."*
> *Interviewer: "Oh, because you are already there on site."*
> *F7: "Exactly right. Already when going out. There is for example place A, I drive past place A, towards place B and on the site of place B, there I see already the first ducks already swimming. I know that in two or three days the rest will be there. So, I'm already starting to avoid that area. In order not to get a duck in [the net] at all. [...] So you just have to keep your eyes open as a fisher, if one sees that. And one also knows from his father or from his grandparents, where the ducks are."*
> (F7, Paragraph 162-166)[111]

The use of technical measures is also rooted in the voluntary agreement of Schleswig-Holstein, where fishers commit themselves, inter alia, to apply PALs to their nets, in order to alert porpoises of an obstacle and therefore to redirect it.

> *"What I also said before, that the fisher voluntarily already reduces his number of nets, and we also - with these pingers that we use extra against porpoises*."
> (F7, Paragraph 142)[112]

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[110] „Ich hab auch so Sachen gemacht, morgens ausgesetzt, m eimal wieder hochgeholt, //ja// guck ma hier so geht das. was sollste fangen. isaja, der Fisch ernährt sich morgens und abends. //ja// tachsüber frisst er nich und nachts in der Nacht frisst er auch nicht. s nur wenn die Sonne aufgeht wenn die Sonne untergeht. //ja// kommter ran zum Fressen, denn krichste die Viecher. //hm// dann läuft er. un nix anderes. //hm// ne deswegen hab ich gemacht morgens ausgesetzt und gleich wieder hoch geholt. //hm// or komm de Fische. @(.)@ da geht das Wunder Wunder" (F9, Paragraph 123)

[111] F7: „Weil wir die ja sehen."

Interviewer: „Ach so, weil ihr dort schon vor Ort seid."

F7: „Genau richtig. (.) //aha// (.) Schon beim rausfahren. (.) Da=is zum Beispiel ähm, (1) sag ich mal, is Ort A, ich fahr Ort A, (.) Richtung Ort B und auf der (.) Ort B, da seh ich schon die ersten Enten schon schwimm. Da weiß ich haargenau in zwei, drei Tagen is der Rest auch da. Also fang ich schonmal an, das da zu meiden. (1) Um überhaupt, nicht eine Ente (.) //mhm// reinzukriegen. […] Also man muss nur als Fischer n halt nur die Augen aufhalten. (.) Wenn man das sieht, und man: weiß ja auch äh, von sein Va:ter oder von sein Großeltern, wo sich die Enten aufhalten." (F7, Paragraph 162-166)

[112] „Was ich auch schon sagte, dass der Fischer freiwillig schon seine (.) Netzanzahl erfe- verringert, //ja// und wir auch mit diesen (2) Pingern, die wir extra gegen (3) Schweinswale einsetzen. (F7, Paragraph 142)

Fishers are applying pingers *extra*, which amounts to additional work. It is narrated as going out of their way to apply pingers *against* porpoises and not *for* their protection.

Hope is also expressed as a strategy to mitigate bycatch. Hope implies a "confrontation with the limitations of one's agency" (Miceli & Castelfranchi, 2010, p. 257). Hope is characterized by a mixture of goal / wish and the possibility that it will be fulfilled as well as by the belief that there are underlying powers that cannot be controlled. It does not ignore or reject the belief in probability, but merely holds on to the belief in possibility. Hope can continue to view the positive prospect as long as it is possible, without changing probability estimates (Miceli & Castelfranchi, 2010, p. 257).

> Interviewer: *"How do you manage to have fewer ducks in it?"* [...]
> F5: *"Yes, you can't manage that at all. That, that, that's not possible. You can only hope every day that they're not in there."*
> (F5, Paragraph 136-137)[113]

While fishers hope that there will be no bycatch events during their fishing practice, there seems to be no mitigation strategy within their power to reach that goal. In this sense the concept of hope stands in one line with the plausibility of *Widerfahrnis* of bycatch.

Although hope is listed as a mitigation strategy, it is rather classified it as a "non-mitigation" strategy. Hoping for no bycatch does not result in a particular observable or articulable social practice, but results in a bycatch practice that is characterized by the absence of active mitigation practices.

[113] Interviewer: „Ähm: (.) Wie schaffen Sie es, dass Sie weniger Enten drin haben? […]"
F5: „Ja, das schaffst gar nicht. Das das- (2) Das geht nicht. D- d- (.) Da kannst äh äh: nur jeden Tag hoffen, dass sie nicht drin sind. //hm//" (1) (F5, Paragraph 136-137)

5.2.4 Stratification model of bycatch practice

The study of the importance of unintended consequences for system reproduction is one of the most important tasks of the social sciences (Giddens, 1984, p. 285). The knowledgeabilities of actors are limited by the unconsciousness but also by the unacknowledged conditions and unintended consequences of action (Giddens, 1984, p. 282). In the following section the elaborated properties of bycatch practice are used to frame bycatch as an unintended consequence.

As shown above, Giddens presents routine as a mechanism to avoid anxiety and guilt (Loyal, 2003, p. 55). In this manner, the normalizing process of bycatch is interpreted as a mechanism to avoid guilt and therefore assumes that fishers act under the influence of the normative concept that bycatch is an unwanted practice. This way it can be shown that even though a normalization process takes place, which seems to suggest indifference about bycatch of mostly seabirds, this is not necessarily the case. In view of routinization, the implicit criteria of action are only raised into the explicitness of discursive consciousness in special situations, above all crisis situations (Reckwitz, 2007, p. 319). Bycatch events of sea mammals have been reconstructed as such a crisis situation and are therefore events characterized by a radical, unpredictable rupture that threatens or destroys the certainty of institutionalized routines (Giddens, 1984, p. 61).

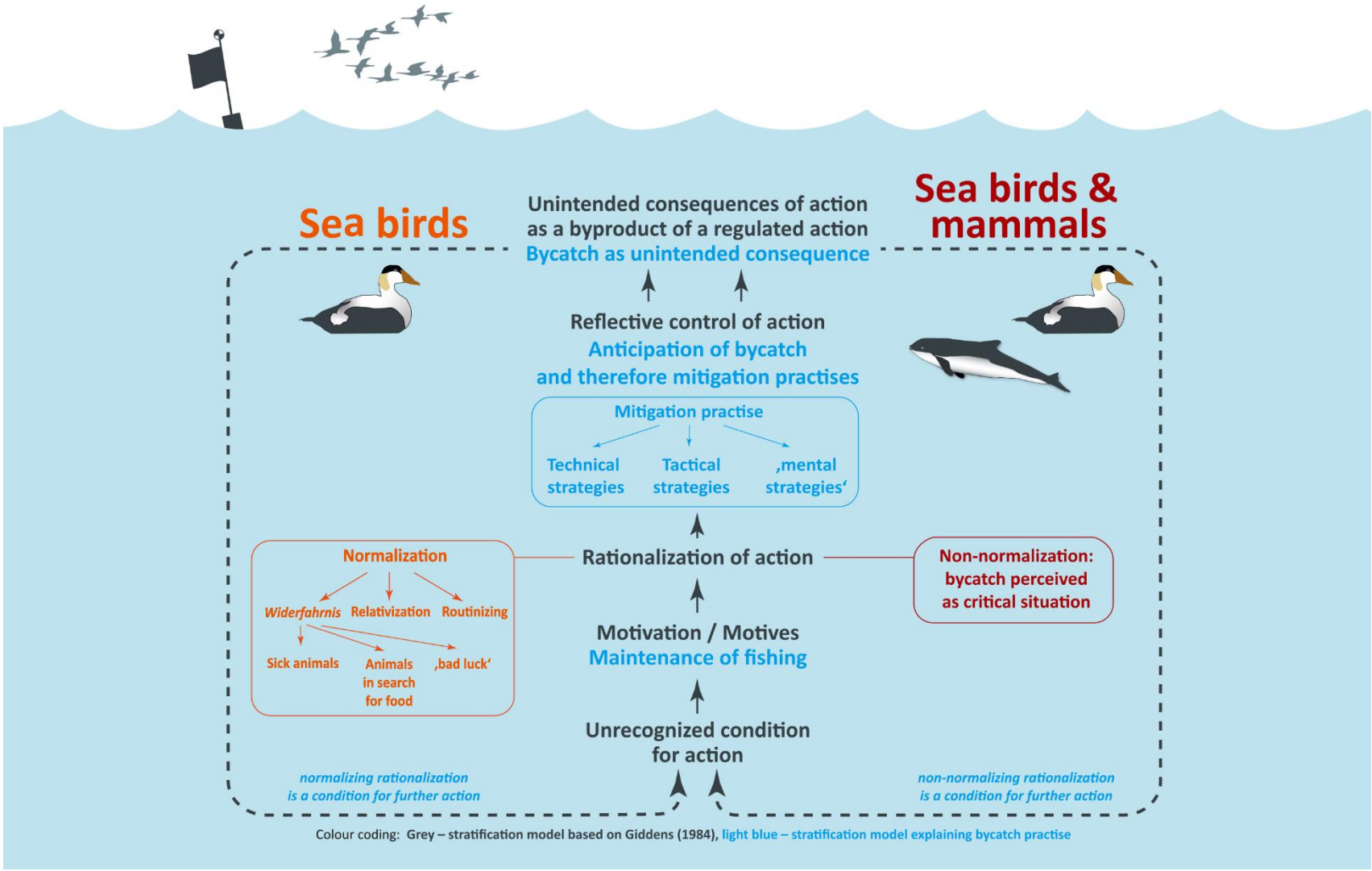
According to the structuration theories' stratification model (Giddens, 1997, p. 56) it is concluded that different bycatch practices lead to different actions with different outcomes. Nevertheless, it was not documented in the interviews that a non-normalizing practice necessarily leads to more precautionary actions towards bycatch mitigation. In the following model, adapted after Giddens (1984, p. 5) the stratification of bycatch practices is illustrated (Fig. 10).

The motivation to act consists of motives that are not necessarily conscious and are triggered by needs that prompt actions (Giddens 1984, p. 6). Motives are not the triggers for routine actions, but "for the most part motives supply overall plans or programmes […] within which a range of conduct is enacted" (Giddens, 1984, p. 6). For gillnet fishers, the motivation for practice is to maintain fishing; it applies to all types of agencies of fishers, some of whom may well decide to stop fishing depending on external influences. However, bycatch events are not a contributing factor to abandonment. At the level of practical awareness, a rationalization of

action takes place that allows actors to develop at least a theoretical understanding of the reasons for their actions. This does not mean that these reasons can be discursively negotiated, but they can be reconstructed by describing the level of action when addressed (Giddens, 1984, p. 49), as was done documentarily in this case. Here, different rationalizations for action can be identified in the interviews that can be related to the species being bycaught (Fig. 10). Thus, although harbor porpoise bycatch is perceived as critical, fishers take the risk of (by)catching harbor porpoises by continuing their fishing practices. Rationalization means that fishers maintain a theoretical understanding of their actions (Giddens, 1984, p. 5). Related to bycatch, rationalization occurs by practicing various avoidance strategies as well as hoping that no animals will be caught. Additionally, there are no legally binding regulations prohibiting bycatch, which would make this practice a legally deviant behavior. At the same time, bycatch is rationalized through three mechanisms: by narrating it as *Widerfahrnis*, relativizing it, and routinizing it. The normalizing bycatch practice was shown to be hegemonic: the existing conditions are accepted and thus consolidated. Although knowledgeable actors reflexively observe and control their actions, this does not necessarily mean cognitive-moral reflection of the actions (Reckwitz, 2007, p. 320). However, a cognitive moral reflection was documented in the practice of non-normalization of bycatch. In the phase of reflexive control of action, bycatch is also accepted on a discursive level and gillnet fishing is practiced in a routine manner. Knowledgeable actors control their actions based on action motivation and action rationalization and expect others to do so as well (Giddens, 1984, p. 6). This means that bycatch events can be accepted, based on different action rationalizations. This in turn can then lead to bycatch as an unintended consequence of action and is thus a by-product of regulated and directed action. Unintentional consequences mean that the consequences are inconsistent with the beliefs of actors and were not pursued by them (Giddens, 1984, p. 8). These unintended consequences of bycatch practice, in turn, form a precondition for further bycatch practice. Bycatch might be an unintended but not unanticipated consequence, as analysis has shown. It is therefore a form of permitted outcome (Zwart, 2015, p. 295). When fishers document how bycatch cannot be avoided and it is part of everyday fishing activity, which means it is an accepted social practice, this rationale is primarily based on the motive of maintaining the fishery. They can act differently, namely by stopping to fish. As presented in the model (Fig. 10), that means that the maintenance of fishing, and therefore the accepted

and anticipated risk of bycatch as well as the practice of bycatch (normalizing and non-normalizing), is mutual knowledge.

Figure 10: Stratification model of bycatch practice



5.3 Implications for bycatch management

Having presented three different types of fishers' agency, who operate within the same regulatory background, it was shown that there are different ways to interpret fisheries-management rules in everyday work, depending on different social fishing practices. In the following section we explore what the generated knowledge about fishers' agency and bycatch practice can specifically mean in a management context, and the insights are connected to the results from the expert workshop. Different management instruments are then discussed during the expert workshop (Table 5).

5.3.1 Relevancies of fishers' agency for bycatch management

Projective fishers are likely to be innovative and are therefore the most interesting partners for scientific projects. The findings support that a certain type of fisher, projective and with a stake, is more likely to be selected for and to participate in research, which can lead to a selection bias. This needs to be considered when interpreting results of stakeholder research projects and establishing relationships between science and the fishing industry (Steins et al., 2020, p. 146). Fishers have been established as being short-term oriented and with inadequate coping strategies (Coulthard, 2012, p. 5) or described as very traditional and reluctant to change their fishing activity (S. Eayrs et al., 2015, p. 1553). While this might be true for iterational and partly for evaluative fishers, the results on projective fishers contradict these findings. Projective fishers can be addressed to strengthen management instruments in manifold ways: they can be a target group for new communication strategies where they are addressed as gatekeepers for their community (Creative Research, 2009, p. 115). In their role as intermediaries, gatekeepers can help understand fishers' perspectives and make management rationale understandable to fishers, and in this way, they help manage expectations on all sides. Projective fishers can also be part of a co-management strategy, or they can be part of post-implementation monitoring, suggested for evaluating management instruments for bycatch reduction (Soykan et al., 2008, p. 98; Barz et al., 2020, p. 7)

Iterational fishers need guidance to undertake a change in fishing practice, because they are most unlikely to develop or pick up new schemes of actions. Managers need to communicate regulations and expectations comprehensibly. It is recommended to involve a clear

communication strategy with all newly implemented management instruments. This will be useful for all stakeholders (Creative Research, 2009, p. 120), but especially for iterational fishers (Barz et al., 2020, p. 7).

Evaluative fishers are opportunists who are looking for pragmatic solutions. They will most likely find their way in manifold situations, even if it means breaking the law or exiting fishing. They are used to balance decision-making according to different situations and might not be swayed by management instruments that do not allow for own decisions. In the latter case, they can resort to illegal fishing actions. It is suggested to create room for own decisions for evaluative fishers, for example, with results-based management approaches that focus on the outcome of fishing activities but leave implementation details to fisheries (Nolde Nielsen et al., 2015; Barz et al., 2020, p. 7).

During the workshop, experts identified environmental management instruments for the German Baltic Sea (Table 5). They were categorized according to *low degree of state intervention to high degree of state intervention: persuasive instruments, cooperative instruments, processual instruments, market instruments, and regulatory instruments* (Böcher & Töller, 2012, p. 75; Barz et al., 2020, p. 5).

Table 5: Exploring different environmental policy instruments and their assessment by experts against findings from the interviews and characteristics of fishers' agency (Böcher & Töller, 2007, p. 306) (Barz et al., 2020, p.6)

	Instruments based on literature	***Concrete instruments based on expert workshop***	***Assessment of instruments during the expert workshop***	***Assessment of instruments, if they were mentioned during the interviews, according to fisher types***
Persuasive instruments	*Information on environmental topics*	*Bycatch data collection*	*Reliable bycatch data needs to be basis for bycatch management* *Distrust on different levels hinders data collection*	*Most fishers of all types do not view bycatch of seas birds as a problem.* *Most evaluative and iterational fishers distrust the consequences of data collection.* *Most projective fishers participated in scientific data collection before and are therefore most likely to do it again. Another projective fisher offered to participate in bycatch mitigating research, without being asked about it.*
	Eco-Labels	*MSC - labeling*	*Can increase fishers' income*	*Projective and evaluative fishers, who are most likely to engage in direct marketing, have a higher demand then they can supply, even without MSC.* *Iterational fishers, who discussed MSC, claimed it would not be worth it for their small vessels.*
	Education on environmental topics	*Adapting curriculum of fisheries training school*	*Experts were not sure about the impact, since numbers of new gillnetters entering the sector are very low*	*No discussion of the topic.*

Cooperative instruments	*Voluntary agreements*	*Voluntary Agreement of Schleswig-Holstein*	*Does not need a strong legal framework, works partly* *Little control and no scientific monitoring, no concrete agreed objective*	*Evaluative fishers who knowingly participate view it as a sign of good will.* *Some fishers of all types do not know whether they are part of the agreement or how it works.*
Procedural instruments	*No discussion of the topic*			
Market-based instruments	*Financial support programs*	*EU (EMFF) funds for e.g. alternative gears*	*Perceived as overly bureaucratic* *Will not work under current EMFF regulations*	*No discussion of the topic.*
	Subsidies	*Subsidies*	*Fishers can receive manifold subsidies already*	*Fishers of all types prefer fishing over receiving subsidies for not fishing.*
Regulatory instruments	*Requirements / prohibitions*	*Alternative gear*	*Fishers need to be able to handle alternative gear* *Regulations need to allow for alternative gear* *Mitigating gear can be a strong incentive in areas where seals are perceived as a strong competitor for fish*	*Iterational fishers are skeptical towards new gear and see no alternative to gillnets; projective and evaluative fishers have used different gear before.* *Catchability is the greatest concern of alternative gears for projective and evaluative fishers.*

	Closed areas and/or seasons	*Experts worry about fishers' businesses and their livelihoods when constraining their areas and seasons further*	*Most fishers of all types avoid areas perceived as high risk for bycatch of seabirds, without any regulation in place.*
Regulations	*Reporting of bycatch*	*No discussion on topic*	

5.3.2 Environmental policy instruments to mitigate bycatch

Persuasive instruments can be education and information on bycatch of seabirds and mammals and on how bycatch is threatening the ecosystem. In order to start informing about bycatch, workshop participants suggested collecting reliable data about bycatch first. They hypothesized that collecting data can be difficult due to a distrusting relationship between fishers and other stakeholders. The narratives from the interviewed fishers supported this hypothesis; most iterational and evaluative fishers stated that they are sometimes afraid of talking to scientists or administrative people about sensitive topics such as bycatch, whereas projective fishers have participated in scientific projects before or are willing to do so. Experts discussed (MSC) labeling as a persuasive instrument, where bycatch awareness could be included. Based on the interviews it is concluded that most fishers do not see an incentive to acquire an MSC label. Projective and evaluative fishers, who most likely sold fish directly to the customers, claimed they have a higher demand than they can supply, whereas iterational fishers who discussed MSC did not see the benefit a certification, partly due to their small vessels. Experts also suggested adapting the curriculum of fisheries training school in order to inform and educate early on about bycatch-related issues. However, they were not sure how big the impact might be, since there are only a few new gillnetters entering the Baltic Sea. However, *expanding fishing education to focus on bycatch and its significance for the ecosystem of the Baltic Sea will be suitable for all types of fishers. These instruments are especially useful to address a change in bycatch practice: normalizing and non-normalizing. Perception of bycatch as a problem can vary when charismatic or endangered species of conservation interest are involved (Campbell & Cornwell, 2008, p. 326), which can explain different social practices.* Opposed to the hegemonic bycatch practice of normalizing bycatch*, protective international agreements such as ASCOBANS (2012) proclaim a non-normalizing practice and social practice as a societal goal. A change towards a non-normalizing practice on bycatch could lead to more sustainable actions, such as the application of active mitigation strategies from fishers. Literature on discourse interventions inspires further bycatch mitigation measures besides education. Tools for discursive change can be communication tools: from micro-level instruments such as framing of certain terms to macro-level strategies, such as campaigns* aiming at normative change or adapting to structural conditions (Wilkins, 1999, p. 51; Barz et al., 2020, p. 7).

Cooperative instruments, characterized by negotiations between political and societal actors, aim at creating common ground for collective actions. Treating different stakeholders as equal partners

facilitates informal agreements. Nonetheless, these cooperative instruments emerge under the threat of state intervention (Böcher & Töller, 2012, p. 81). Co-management is often recommended in fisheries management (Soykan et al., 2008, p. 8), where it has been shown, for example, to generate a high uptake of bycatch reduction technology, when fishers are part of the design (Jenkins, 2006, p. V) or increase fishers' efforts to mitigate bycatch (Peckham et al., 2007, p. 4). Cooperative instruments in co-management processes create a framework where projective and evaluative fishers can act future-oriented. Collaborative processes can be an integral part of ecosystem-based management approaches. They can facilitate communication, resolve conflicts, and minimize information asymmetries via, inter alia, education (Imperial, 1999, p. 456).

In Schleswig-Holstein, one of the two German federal states bordering the Baltic Sea, a voluntary agreement to mitigate bycatch has been negotiated and introduced in 2015 (Landesfischereiverband Schleswig-Holstein et al., 2015). The agreement combines different aspects of cooperative instruments (Landesfischereiverband Schleswig-Holstein et al., 2015): it provides social incentives (by letting fishers show their engagement in bycatch mitigating practices), participative management strategies (different stakeholder groups were involved in the negotiating process), and independent monitoring (through an environmental association). The interviewed fishers are ambivalent about the agreement. Some do not agree with closed areas or do not see the necessity of using PALs. Campbell and Cornwell (2008) state that the shared responsibility of designing and testing bycatch reducing technology can improve the relationship between fishers and researchers and/or managers (p. 327). *Some of the interviewed evaluative fishers signed the agreement and used PALs because their cooperative asked them to do so, and they see it as a sign of good will that fishers actively participate in mitigating bycatch. After considering the role of the agreement in Schleswig-Holstein, as well as its strengths and weaknesses, it is suggested to implement a similar form of voluntary agreement in Mecklenburg-Western Pomerania, the other German federal state at the Baltic Sea. It is important to learn from the experience of the agreement in Schleswig-Holstein, determine systematically which factors make it successful or unsuccessful, and establish suitable structures in Mecklenburg-Western Pomerania before starting another agreement. It is argued that a voluntary agreement can reach all types of fishers: projective fishers might see it as a long-time strategy to avoid bycatch, and evaluative fishers stated that participation could be a sign of good will. Some evaluative fishers as*

well as iterational fishers seem to participate because their cooperative tells them to and they usually follow their instructions (Barz et al., 2020, p. 5).

Procedural instruments seem to be a gap in management, which could be filled in the future with, for example, an ecosystem assessment, where bycatch is included. Projective fishers are, again, most likely to participate in an assessment process, if it is voluntary. It might be necessary to link an assessment to a regulation if management expects all types of fishers to participate (Barz et al., 2020, p. 8).

Market-based instruments, such as EU-funding and subsidies, were discussed at length during the workshop. They appeared to be the first management options that came to mind. Market-based instruments focus on economic incentives to induce a change in behavior. However, monetary incentives and other economic incentives are no panaceas and can crowd out intrinsic motivations (Bowles, 2008, p. 1605). Many fishery issues are studied under the assumption that fishers seek to maximize profits, leaving other components out of consideration when looking at fishers' decision making (Watson & Haynie, 2018). This does not mean, however, that they do not make use of many of the subsidies made available to them. *Nevertheless, most fishers do not seem to want to spend their time or do not have the capacity to apply for grants in complex procedures. Projective fishers do not base their business strategies on how to maximize subsidies, whereas evaluative fishers are more likely to seek funding opportunities. During the workshop, experts agreed that there are sufficient subsidies for fisheries in place already and therefore monetary incentives are not seen as an appropriate tool for bycatch mitigation* (Barz et al., 2020, p. 5).

Regulative instruments are the traditional and most common form of instruments in environmental politics. They are binding, hierarchical management options that restrict individual choices and express socially desirable behavior, which can create conflicts between regulating institutions and regulated actors (Böcher & Töller, 2012, p. 76). They can include: identifying high-risk areas and seasons, especially for bird bycatch, and closing them in an adaptive, real-time management approach (Dunn et al., 2016); mandatory reporting of bycaught taxa; and usage of bycatch mitigating gears.

While iterational fishers were skeptical towards alternative gears and emphasized that gillnets have no alternative, evaluative and projective fishers have used different gear before, for example weirs. Experts were concerned that fishers would need to be able to handle newly developed gear

while fishers worried mainly about catchability. Since seals have resettled in the Greifswald Bay and interactions with gillnet fishers may cause significant operational and economic impacts (Waldo et al., 2020, p. 815), experts discussed that bycatch- and seal-safe gears can be incentives to use gears other than gillnets in the future. By choosing an adaptive approach, managers could link, for example, a fishing license to certain gear, the application of a mobile phone app, or the use of cameras to document bycatch. Evaluative and projective fishers who used, for example, weirs are more likely to work with new gear than iterational fishers, who see no alternative to gillnets (Barz et al., 2020, p. 5). Generally, when it comes to alternative gears, there is a lot of experience with different forms of weirs amongst gillnet fishers. It is therefore concluded that it would be worthwhile for researchers or developers to consider the knowledge of the fishers who use weirs when developing bycatch mitigating gears. This process is on the one hand a co-learning as well as co-managing process, both enabling factors on the actors' side for establishing new social fishing practices. On the other hand, it echoes with iterational, evaluative, and projective agency as well. Fishers who have used weirs before can apply their established fishing practices and retrieve known schemes of actions. Since it is a widely applied gear, there is enough knowledge around to strike fishers evaluative agency, even if they do not have experiences with weirs. In this case, specific handling knowledge can be provided and fishers can evaluate based on their current practice and new schemes of action presented to them. In another consideration, establishing weirs can also stimulate the projective chord of agency, when fishers are enabled to realize weirs as a long-term project and investment in the future of their business. These enabling strategies on the actors' side should be supported by enabling structures. Currently there are two constraining structural factors hindering fishers to apply weirs: the purchase price and the non-existing possibility to get a license for a location. Both could be changed with appropriate management measures, which would then indirectly work as bycatch mitigation measures.

Although the interviewed fishers argue that they have always been avoiding high-risk areas for bycatch of seabirds, they also stated that some fishers would still visit these sites, which underlines the need for adaptive regulations. Furthermore, when creating different instruments, managers need to keep in mind that any type of fisher is considerably immobile locally, which can be due to their view of fishing as way of life (Yuerlita et al., 2013, p. 94; Barz et al., 2020, p. 8).

5.3.3 Transformation potential

After the detailed description of concrete management instruments, this chapter is concluded in brief with a theoretical linking of the results with the inherent transformational moments of social practices.

As already shown, the basic idea of structuration assumes that actions are accompanied by possibilities of change, whether intended or unintended. Changes arise from a deviant performance of the current social practice. New practices emerge when the deviant action is reproduced by a significant number of relevant actors (Schallnus, 2006, p. 61). The emergence of new practices can thus change the relevant structures in the long-term (Giddens, 1984, p. 376).

> "The seed of change is there in every act which contributes towards the reproduction of any 'ordered' form of social life" (Giddens, 1979, p. 108) (highlight in original).

This is a theoretical starting point for a transformed social fishing practice and bycatch practice. Through a non-normalization of bycatch by fishers, for example, brought about by environmental education, this social practice can be changed, as already indicated above, and new mutual knowledge can be brought about. The established agency types are by no means fixed categories into which fishers can be categorized:

> "We contend that as actors alter or shift between their agentic orientations, dialogically reconstructing the internal composition of their chordal triad, they may increase or decrease their capacity for invention, choice, and transformative impact in relation to the situational contexts within which they act." (Emirbayer & Mische, 1998, p. 1003).

Accordingly, the already existing transformative potential must be strengthened and the transformative potential can also be elicited in iterational and evaluative fishers (who have only partially documented transformative potential and capacity to change). Emirbayer and Mische (1998) locate the moment that can bring about a change of agency in the relations of agentic possibilities to structural contexts (p. 973). Accordingly, structural conditions must be created that are enabling and allow actors to pursue projects, increase their capacity for practical evaluation, and transform the situational contexts of their actions (Emirbayer & Mische, 1998, p. 994). For this reason, what fishers document as enabling as well as constraining was explored. It was indicated that projective agency as well as partly evaluative agency acts as enabling, while iterational agency acts as constraining in the production of new, changed social practices. It is therefore important to

create management instruments that reinforce the enabling factors and reduce the constraining factors to enable fishers to shift their agentic orientation.

"It is not enough to know - one must also implement.
It is not enough to want - one must also do."[114]

(Goethe, 2016, p. 401)

6 Bycatch mitigation: understanding fishers' social practices and incorporating them into natural resource management

6.1 Summary

The point of departure of this research is the fact that seabirds and sea mammals die as unwanted bycatch in gillnets, thus putting a part of the ecosystem at risk and endangering the existence of some species. The importance of the conservation of these animals is politically confirmed in many national and international agreements, and there have been many attempts to solve the problem of bycatch in a technical and tactical way, for example, by using deterring devices to warn animals or using alternative gear. Previous fisheries management measures are seen as insufficient and partly unsuccessful in many areas (e.g., Eayrs & Pol, 2019, for the uptake of newly developed gear) and that this mismatch should be addressed from a social science perspective (Leenhardt et al., 2015, p. 49). In the field of fisheries, too, the focus is actually on the interactions of people with nature or natural resources, because boats don't fish, people do. The aim of this work was to empirically assess the social fishing practices of German gillnet fishers in general, and in particular with bycatch, and to incorporate these findings into possible management measures to prevent bycatch. Possibilities are sought to empirically capture fishers' practices from the actors' perspective. It is important to describe them in detail and in a differentiated manner, without losing sight of the contexts in which the fishers act due to their highly structured environment, which is governed by legal regulations.

An extensive literature study has shown that there is already a foundation of knowledge about fishers from various fisheries in the social sciences. In general, this applies above all to research on the behavior of fishers with regard to their compliance with management rules. Here it is particularly apparent that the perceived legitimacy of rules, which can be increased, for example, by the participation of fishers in the development process, plays an important role in compliance

[114] Es ist nicht genug zu wissen – man muss auch anwenden.
Es ist nicht genug zu wollen – man muss auch tun.

with rules. Furthermore, various studies have investigated how the behavior of fishers can be influenced or steered towards desired behavior through a range of incentives. In addition to the realization that economic incentives are not a panacea, it is important to note that situation-specific and comprehensive incentives are important for a change of behavior. Nevertheless, the study of fishers' attitudes and perceptions is important to support the adaptation to the situation as just proclaimed. A review of the literature on typologies of fishers has shown that the tool of typologies has attracted interest in fisheries research. For example, fishers have been typified in terms of their role in communities or their strategic fishing behavior.

However, the literature also shows that a typology in terms of bycatch behavior of fishers, as well as a differentiation of fishers who dominantly use only one type of gear, has not yet been attempted. At the same time, the literature on bycatch mitigation is mostly dominated by technical and tactical aspects, and research including the human dimension is mainly characterized by the demand for an actor-based approach to bycatch mitigation, but does not present explicit results. The aim of this work was therefore to close these gaps by identifying a typology of gillnet fishers, using qualitative methods, and to record their practices, especially with regard to bycatch. Furthermore, it aimed to incorporate these findings into an explorative process to develop measures to mitigate bycatch, which can then be designed more effectively because they are based on ontological knowledge about the fishers.

To answer these questions, this work draws on theoretical and empirical foundations of sociological practice theory as well as the basics of environmental management.

The sociological perspective allows for conceptualizing and understanding the fishers' social fishing practices and lays the foundation for discussing social fishing practices in the context of environmental management. The social fishing practice of fishers is made perceptible and understood with the help of the concepts and terminology of structural theory (Giddens, 1984), while basic literature in the field of environmental management provides a template for the discussion of bycatch-reducing measures (Böcher & Töller, 2012, p. 76)

In accordance with a subject-related choice of research method, a qualitative research approach was chosen, which is suitable to access and form theories about social practice. (Przyborski & Wohlrab-Sahr, 2014, p. 11). Qualitative methods offer the possibility to focus on a narrow field and to explore it in a depth adequate to the question. This depth was achieved in the present work through the analytical technique of the documentary method (Nohl, 2013). The documentary

method allows access to and the reconstruction of orientation frames and mutual knowledge that guide actions. The documentary method offers the possibility to reconstruct different types of social practices of gillnet fishers on the basis of interviews, which were collected in this study by means of problem-centered interviews (Witzel, 2000). This possibility of looking at different social practices is central to the question of the heterogeneity of fishers.

With recourse to Emirbayer & Mische (1998), social practices can be captured and conceptualized in terms of agency. The stratification model of structuration theory (Giddens, 1984, p. 5), on the other hand, enables the description of bycatch practices. Furthermore, expert opinions were captured in the context of an expert workshop, focusing on the structural perspective on bycatch mitigation, such as implementing new regulations. The main aim here was to include the application-related perspective and to explore ideas of the stakeholders or to discuss ideas based on the interviews. Subsequently, based on the fundamental knowledge about the heterogeneity of fishers and their characteristics, suggestions for more effective management practices could be made.

The analysis of social fishing practices showed that these are generally multi-layered and complex. Even though the structural framework of regulations is the same for all fishers, the present study was able to show the heterogeneity of fishers in their engagement with these frameworks. How this engagement occurs is related to the different dominating agency characteristics of fishers. Agency is therefore characterized as engagement of actors that manifests itself depending on different structural environments and the temporal-relational contexts. In the interplay of habit (past-oriented), imagination (future-oriented), and judgment (present-oriented) of these structural environments, they are reproduced and transformed. In applying these different orientations, actors can react to problems that arise through the changing contexts of their actions. The possible reactions include three constitutive elements, which are described for fishers in this study: iteration, projectivity, and evaluation (Emirbayer & Mische, 1998, p. 970).

- **Iterational aspects** of agency are characterized through the iteration of known schemes of action, which are therefore reproduced social practices (Emirbayer & Mische, 1998, p. 971). Such iterational aspects can be seen in fishers who solely apply gillnets, because they have routinized their application and have been socialized into fishing with them. Fishers with a dominating iterational agency are not very likely to try alternative fishing gears or change their social fishing practice if they are not forced to do so. They focus on maintaining their

equipment and vessels as well as their fishing grounds. During the analysis of the interviews, iterational aspects of agency were identified as constraining for a transformation towards a more mitigating practice. Iterational agency also makes new management approaches difficult, if not impossible, to adopt, such as a change away from gillnet towards alternative gears. Fishers with dominant iterational agency tended to be associated with the cod-dominated landing profile (Meyer & Krumme, 2021, p. 9), suggesting that there is a relationship between iterational social fishing practices and the composition or variety of the catch. However, this hypothesis would need to be further developed and tested. Since iterational agency leads to the reproduction of known social fishing practices, regulations might be the only management instruments that are able to force fishers with dominant iterational agency to transform their fishing practice.

- **Evaluative aspects** of agency show in the processing of different schemes of actions and a constant evaluation as well as re-evaluation of situations. They are particularly evident in the moment of adaptation of the fishers—when they decide whether the establishment of a newly developed scheme of action or the maintenance of an established scheme of action is currently appropriate. In particular, these moments are documented in the cases of fishers who had already learned another profession before becoming a fisher, but then decided to go into fishing professionally. Evaluative agency also occurs in the use of alternative fishing gear. Experimentation with other gears may lead fishers to choose to use alternatives in the long run, or to conclude that they will continue with their established schemes of actions, in this case the use of gillnets. Evaluative social practices are not teleological but are characterized in fishery by decisions of action that are directed to present situations and by crises. Thus, it can be argued that fluctuating management—for example, quotas being dictated by variable biological stock status—is precisely what supports this form of agency in fishers.
- **Projective agency** is characterized by fishers planning for the long term, while keeping abreast of current developments in the fishery. This type of agency is also characterized by the development of teleological projects, which can include the expansion of marketing strategies, the testing of alternative gears to gillnets, or the cooperation with scientists to help secure the profession for the future.

The analysis of agency reveals how structural environments are both maintained and changed by human agency—by actors who are able to formulate projects for the future and realize them in the present, even if only on a small scale and with unpredictable consequences (Emirbayer & Mische, 1998, p. 964). Actors have "a chordial triad of agency within which all three dimensions resonate […] where one or another of these tones on the chordial triad" sounds most forcefully (Emirbayer & Mische, 1998, p. 972). Therefore, the potential for transformation lies in playing the projective and, in parts, the evaluative chord of fishers.

Furthermore, the analysis of bycatch behavior resulted in two different practices: normalization and non-normalization of bycatch. The reproduction of these social practices can be explained at the individual level by referring to the model of social stratification (Giddens, 1984, p. 5) (Fig.10, chapter 5.2.4). The basis of the practice is the fishers' motivation to act, which describes the need that prompts action (Giddens, 1984, p. 6) and is characterized here as maintaining gillnet fishing. At the level of rationalization, which is the theoretical understanding for actions but cannot necessarily explicitly verbalized by actors (Giddens, 1984, p. 5), two different forms are identified: normalization as well as non-normalization of bycatch.

- **Non-normalization** of bycatch mostly concerns harbor porpoise bycatch, which can be described as a critical situation. The critical situation describes the opposite of a routine and can directly threaten the ontological security system, which is sustained by routines (Giddens, 1984, p. 51).
- The other form of rationalization is expressed in a **normalizing process**, during which bycatch—in this context mostly bycatch of seabirds—is understood as part of a routine that is expressed in different mechanisms. For one, fishers classify the experience of seabird bycatch as (i) *Widerfahrnis*, meaning that they describe it as something that occurred to them. This excludes responsibility on the part of the fishers' social practice. The responsibility is rather located in the ecological sphere and attributed to the animals that get entangled in gillnets because they are sick, foraging, or unlucky. Furthermore, fishers put the bycatch of seabirds into perspective and thereby (ii) relativize it by pointing to the past when many more birds were caught, sometimes even intentionally, by their ancestors. The third mechanism is (iii) routinization, which results from bycatch occurring as part of the work routine, where fishers have established procedures to deal with bycatch.

After a rationalizing process, reflective controlled action takes place, which means that fishers anticipate bycatch, but to meet their motivation, they still go fishing and apply inherent bycatch avoidance measures, such as tactical strategies, technical strategies, or the mere hope for not having bycatch. As an unintended consequence of fishing, bycatch may then occur, which in turn can become an unrecognized condition for further action in the renewed action process. The unintended consequence of bycatch can lead to modified structures, such as a new norm or law on bycatch mitigation measures, which would in turn produce new schemes of actions, because fishers need to integrate these new norms into their social fishing practices.

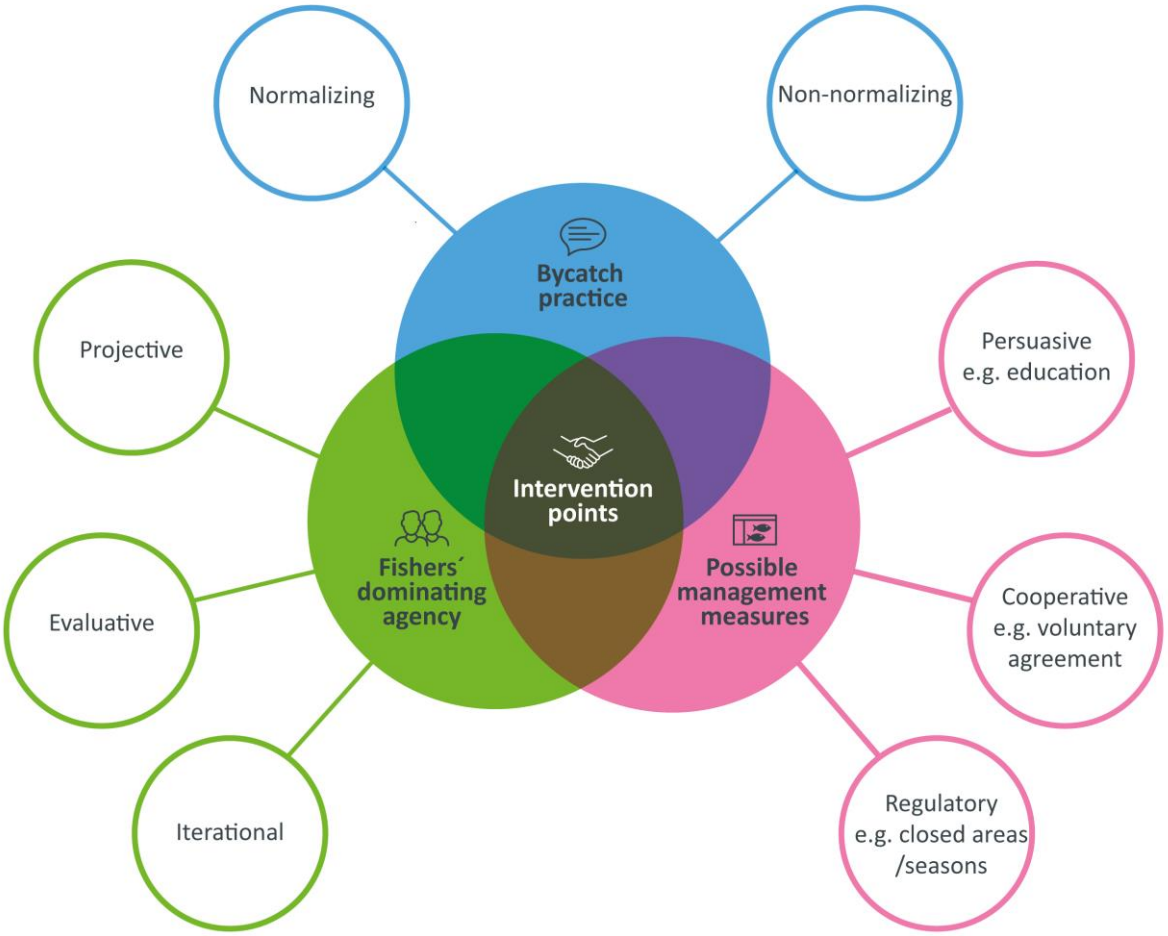
By applying the knowledge of different fisher types and bycatch practices to possible management instruments, a discussion can ensue about numerous measures that can be considered by fishery managers. The recommended management instruments can be divided into measures that can be implemented on relatively short notice and measures that are more likely to be implemented in the medium to long term, because their success will be based in the development of new structures. In the current set up of prevailing structures and conditions the knowledge of fishers' heterogeneity can be incorporated and adaptive management can be developed accordingly. Specifically, three measures are exemplified:

- **Education**: Among other things, the findings on the bycatch practices of fishers have shown that instruments of bycatch-mitigating measures should also start in the educational sector. In addition to focusing adaptive co-management processes, which lead to co-learning and contribute to ecological literacy (Fujitani et al., 2017, p. 1), the educational content of vocational schools can be adapted in such a way that fishers are provided with a more complex understanding of the ecosystem, the significance of bycatch, and the importance of avoiding bycatch. This measure can be of significance for all types of fishers, since they all have to attend vocational schools or advanced training.
- **Technical measure**: Furthermore, particularly based on the interview sections on alternative fishing gear, it can be summarized that a large-scale fish trap as bycatch mitigating gear can be a realistic alternative to a gillnet for some fishers in the medium-term. It would be worthwhile for researchers or developers to consider the knowledge of fishers who are applying the large-scale fish trap when developing bycatch mitigating gears. This process is a co-learning as well as co-managing process, both enabling factors for establishing new social fishing practices.

- **Voluntary agreement**: In the long term it will be necessary to create new structures, such as those found in the voluntary agreement of Schleswig-Holstein. It would be consistent to create a similar agreement for fishers in Mecklenburg-Western Pomerania as well. Within the framework of such an agreement, sustainable co-management, co-learning processes, and collaborative research can be established. In order to succeed, this requires constant cultivation of the relationship between stakeholders and researchers, reflection on equity considerations, and ongoing attention to communication with all groups engaged at various levels (Steins et al., 2020, p. 146). For this purpose, an independently acting bridging organization must be established (Whitty, 2015, p. 139).

Based on the **theorization of these results**, particularly regarding bycatch mitigation, three conceptual focal points can be identified: fishers' agency, bycatch practice, and potential management measures (Fig. 11). However, in terms of their application to actual management, *different intervention points must be brought together to ensure efficiency and should not be considered separately* (Barz et al., 2020, p. 7).

Figure 11: Graphical summary of the results



Limitations of the study and further research questions

Due to the lack of census data on bycatch, it was decided to prioritize selecting fishers with the highest fishing effort based on the assumption that it could lead to potentially more bycatch events. It is, however, unclear if the selected sample is representative of the total fisher population, as vessels with less or little effort may have considerable numbers of bycatch. Future studies should therefore aim to have a representative sample of the gillnet fishery. Moreover, it could also be an option to, for example, select fishers based only on their proximity to conservation areas instead of their fishing effort (Barz et al., 2020, p. 9).

The qualitative study of the fishers should be followed by a study with a larger scope of respondents that makes it possible to *quantify the number of fishers according to their dominating form of agency, which will allow for prioritized and targeted management execution* (Barz et al.,

2020, p. 9). It was briefly shown that the majority of fishers has a dominating evaluative agency, and it seems quite logical that the current fisheries policy, as a temporal-relational context, tends to favor an evaluative orientation from fishers through its partially institutionalized variations, such as the annual quota system. *It would also be very interesting to quantify how fishers deal with bycatch. Within the qualitative data, there are some indications that fishers with large landings and many fishing trips are more likely to non-normalize bycatch. Perhaps fishers with greater fishing effort could have a higher incidence of porpoise bycatch and therefore non-normalize it? The assessment of porpoise bycatch could be different between fishers with either many or few bycatch incidences. Future research should explore innovative ways to generate reliable bycatch data, which is a problem in a lot of bycatch research (Lewison et al., 2011, p. 235), to find out if the quantity of bycatch events correlates with fishers' dominating agency or fishers'* bycatch practice*. Such correlations can lead to bespoke management in bycatch contexts.* (Barz et al., 2020, p. 9).

Different authors argue that agency and other typologies of resource users, which are reconstructed through social-science methods, can help to create informed agent-based models, which then could, inter alia, identify underlying causal mechanisms that can estimate how effective management instruments are and offer entry points for governance (Rounsevell et al., 2012; Wijermans et al., 2020). There also have been efforts to implement qualitative data into agent-based models (Elsawah et al., 2015; Wijermans et al., 2020) to reach a better understanding of communication and decision-making in socio-ecological systems. These efforts can be strengthened by using reconstructive social-science methods to analyze qualitative data. Including fishers' agency into modeling approaches could also lower the uncertainty that is inherent to modeling, such as management-strategy evaluations (Sainsbury et al., 2000).

Another interesting and intuitive perspective on fishers' social fishing practice and especially fishers' entry into the fishing industry is the life-course perspective. However, this idea could unfortunately not be developed further during this thesis and will remain an interesting question for further research.

Apparently, there are hardly any women who work as gillnet fishers in Germany. Nonetheless, women often play a predominant role in processing and marketing the fish as well in providing complementary income, which allows their partners to continue fishing, even if the revenue is low (Young et al., 2008, p. 38). The sample consisted only of male fishers; therefore, out of a theoretical perspective, another study trying to establish or negate a gender bias in social fishing practices

would be enriching. A diversification of perspectives on bycatch and mitigation measures would be also relevant for areas where there are numerous female fishers, such as in British Columbia, *since women and men manage their knowledge differently, which influences their practices in natural resource management* (Yianna, 2001, p. 6; Barz et al., 2020, p. 9).

These numerous ideas for future research, for which this study has laid the foundations, show how much more potential natural resource sociology has to offer in the field of fisheries and other natural resource contexts.

6.2 Conclusion: Managing natural resources as human-nature interactions

More than 50 million fishers around the world are small-scale fishers, with their number growing constantly (Castilla & Defeo, 2005, p. 1324). Managing them in order to conserve resources will mean to do so by taking their different values, perspectives, and interests into account. Natural resource use in general is a highly regulated sphere through various regulations from supra-actors and international agreements, such as the EU or ASCOBANS, and through the norms manifested in these regulations. These regulations have an action guiding character for actors. Nevertheless, they produce differentiable social practices and different types of actions that must be considered in the impact intention of regulations.

This thesis wished to add to a growing body of research in natural resource sociology, to sociological findings in fisheries research, and especially to the theorizing of bycatch practice. Furthermore, this thesis wants to contribute to a theoretical debate on natural resource sociology in the hope that it will foster the legitimization of such knowledge in political processes and therefore actually make a difference in how natural resource management is designed.

The findings of this work can enrich natural resource sociology with a perspective that considers the social practices of resource users and considers both the actor level and the structural level—usually represented by resource management—both empirically and theoretically.

The qualitative reconstruction of social practices provides a basis or an extension for a better understanding of quantitative data, which is often collected in the context of resource use and management. Thus, on the one hand, a general social practice in form of a dominant form of agency could be identified, and at the same time, the social practice connected to a specific social

phenomenon, namely bycatch, could be explored. This knowledge can help to create adapted natural resource management that can reach a higher compliance.

Developing a typology of social fishing practices in general has the added value of characterizing resource user groups and classifying them into groups.

At this point, bycatch is a case-specific problem that can be replaced by many other issues in natural resource research and management. This can be confirmed by the fact that comparable types of actors have also been found in other natural resource management contexts that have focused on different issues, for example, for farmers (Barnes et al., 2011; Kees, 1992) or graziers (Bohnet et al., 2011). *Because of those similar examples of social practices, bespoke management implications developed according to different types of agency—although being more of explorative nature—could be transferable to other contexts in natural resource management* (Barz et al., 2020, p. 9). Bohnet et al. (2011) also emphasize this finding and state that more targeted programs and management can lead to greater benefits in local, regional, national, and even international communities (p. 635).

The documentary method proved to be a well-developed tool in the context of the analysis of social practices, which has already received much attention, testing, and further development in German-speaking countries (e.g., Amling et al., 2020; Nohl, 2013c). However, the method in particular, as well as qualitative reconstructive social research in general, does not yet seem to be widely used in the international context of natural resource sociology.

In addition, the examination of the principles of structuration theory has proven to be very productive for the field of resource sociology as well as resource management. In general, praxeological-reconstructive research dissolves the distinction between basic research and applied research that prevails in many areas of research, because it starts from the everyday practice of the interviewees and searches for deeper underlying rules and structures that can explain the understanding and social practices of the actors in a valid way (Wäckerle, 2017, p. 283). Especially in combination with reconstructive qualitative methods, it is suitable for understanding and describing human-nature interactions as well as enriching theory building in the field. However, in this specific case, the fishers' increased reference to biological and environmental factors as constraints represents a gap in the application of structuration theory to natural resource issues. It would therefore be useful to also look at more recent developments in theories of practice, in

which natural materialities play a more significant role in order to further investigate human-natural resource interactions (e.g., Latour & Roßler, 2007).

In summary, it can be said that the inclusion of sociology, as well as sociologically established theories and qualitative reconstructive methods, has led to practice-relevant insights into the analysis and management of human-nature interaction. At the same time, it could be shown that there is much further potential in this type of research.

In order to pursue sustainable resource management and to mitigate conflicts between the use and conservation of resources in the future, it would be desirable for natural resource sociology to devote attention to understanding this particular form of human-nature interaction and to bring its findings more prominently into the policy advising domain.

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Appendix

Appendix A – Interview guideline for problem-centered interviews, translated into English

Category	Question
Introduction	
	Narrative stimulus: “I would like to ask you to tell me about your story as a fisher. Please start with telling me how you got into fisheries in the first place and then tell me about what happened little by little ever since. Please take your time for details. Everything you have to say is of interest to me.”
	Steering question: “Can you tell me something about your different procurements during this time?”
Fishery	
Motivation	Narrative stimulus: “Please tell me what you find special about fishing?” Ad-hoc question, if “nature” is part of the answer: “What do you mean by ‘nature’? Can you elaborate on that?”
	Steering question: “What do you find important for your work?”
Daily professional life	Narrative stimulus: “Please tell me about your last day at work in detail. Please start with telling me when you got up.”
Resources	Steering question: “Do you fish alone? Are you always fishing alone?”
Challenges	Steering question: “What do you find especially challenging in fisheries?”
Bycatch mitigation of seabirds and sea mammals	
Work practice	Narrative stimulus: “You know, I would like to talk about bycatch of seabirds and sea mammals. Every fisher knows that kind of situation (when there is a bird in the gillnet). Please remember such a situation. How did you handle it?”
Mitigation	Steering question: “How do you manage to avoid / to have less bycatch (of seabirds and sea mammals)?”
Problem	Steering question: “What is, in your opinion, the problem with bycatch (of seabirds and sea mammals)?”
Management options	

Alternative gear	Narrative stimulus: “Please tell me about your experience with alternative gear?” Steering questions: “Have you worked with alternative gear (e.g., pods) before?” “How should / could an alternative gear be design to be used (by you)?”
	Steering questions: “Would you use alternative gears if financial loss would be compensated?” “Would you use alternative gears if you could reach a higher sale price (e.g., due to ecological certification)?” “Would you use alternative gears if you would be rewarded a higher quota?” *The following question was not asked after some interviews: “If there was a theoretical construct such as a quota for bycatch of seabirds and mammals, what would that have to look like?”*
Voluntary agreement of Schleswig-Holstein	“Are you part of the agreement?” Narrative question: “Please tell me how you came to participate / not participate in the voluntary agreement?” Steering question: “How does the agreement work?”
Participative management	Narrative stimulus: “Are you engaged in fisheries management (e.g., in producer organizations)? Or like now, in cooperation with scientists?” “Could you please tell me more about what you are doing and how you came around to doing it?”
	Steering question: “How could you imagine engaging in fisheries management?”
Spatial and temporal closures	Narrative question: “How do spatial and temporal closures change your fishing practice?” Steering question: “What are you doing when the sea bird map shows a red area where you just wanted to go fishing?” (depending on whether voluntary agreement is an option)
Economics	
Income	Steering question: “Do you have another source of income apart from fishing?” “Would you continue to fish if you would not depend on it financially?”
Compliance	

	Narrative question: “Could you please describe how a fisheries’ inspection is carried out?”
Future / end of the interview	
Future	Narrative question: “In your opinion, what will the future of gillnet fishing in the Baltic Sea look like?” Steering question: “How do you plan your personal future as a fisher?”
Wishes	Steering question: “What would you propose for fisheries management?” Steering question: “What would you wish for from fisheries management?”
Closing question	Narrative question: “We have reached the end of the interview – is there anything else you would like to add or talk about?”

Appendix B – Short questionnaire, translated into English

Short questionnaire
How old are you?
When did you start fishing?
How do you sell your fish?
Can you tell me what your income was last year?
What is your level of education / degree you hold?
Are you part of a fishing cooperative?
In which generation are you fishing?
What is your current herring / cod quota? Do you have other quotas?
How many vessels do you own?
Are other members of your family also part of fisheries?

Appendix C – Rules of transcription

(3) resp. (.)	number of seconds that a pause lasts, or short pause
no	emphasised
.	strongly sinking intonation
,	strongly rising intonation
Mayb-	breaking off a word
No:::::	stretching a word
We=did	slurred, merging spoken words
@no@	laughing while saying something
@(.)@	short laugh
//mhm//	hearing signals from the interviewer
°no°	speaking quietly

Appendix D – F12: biographical introduction

F12: Ja, also:, das: äh is familienbelastet, ne. //hm// Also mein Opa is schon, und und Uropa auch und alle soweit, wie von meim Vatters Seite her, (.) soweit ich das rückverfolgen kann, haben die alle immer gefischt. //hm// So. Und da bin ich dazu gekomm. Also ich bin (1) als Junge schon mit m Schlauchboot losgefahren, @(ganz früh)@ . Mit n Schlauchboot und hatt n paar Aalhaken gefischt. Und bin dann immer los, und. (.) Hier is so ne Räucherei bei uns um die Ecke, (.) //hm// und dann (1) Da hab ich dann ab und zu mal ein Butt gefang, (.) von @(mein zehn)@ Aalhaken, die ich da hatte, oder was. //K1: Papa.// Und dann bin ich mit dem ein Butt ganz stolz unterm Arm dahin. Und dann (.) musst ich mich immer hinsetzen mit dem Alten und n Stück Torte essen. Und dann war er ganz froh, dass ich ihm den Butt gebracht hab. @(.)@ Ne, Und ab und zu hab ich dann immer mal 50Pfennig gekriegt oder später mal ne Ma:rk oder so. (.) Und dann war ich immer tot:a:l begeistert, (1) Und äh, ja. Dann wurd das nachher immer mehr, ne. //ok.// Irgendwann hat mein Vater mir dann ein Ruderboot gekauft, dann musst ich erstmal rudern. (1) Dann kriegt ich von meim Vater immer Grenzen, bis dahin, (.) wie weit ich dann immer fahren durfte. //@(.)@// Je älter ich wurde, um so weiter durfte ich dann fahren. (.) Irgendwann kriegt ich dann mein ersten Außenborder, Is mein Vater mit mir noch bis nach Lübeck gefahren, oder so. Da war irgendwo n Gebrauchter zu verkaufen. //hm// (1) Ja und °dann° bin ich irgendwann mit Netze angefangen. (2) Dann hatt ich schon, äh, (1) Also sein Fischereischein, dass man: äh: auch so Netze und und Aalhaken und Reusen fischen darf, den kriegt man ja jetzt automatisch, (1) äh, wenn man ne Lehre in der Fischerei macht. //mhm// Und ich hab den damals noch bevor ich überhaupt Fischerei gelernt hab, (.) äh, bin ich auf so n so n: Lehrgang gewesen, und hab da extra n Fischereischein gemacht. Damit ich fischen durfte. //hm// Offiziell. Vorher war das ja alles inoffiziell, was ich da gemacht hab. //@(.)@// Da kam ja immer der Fischmeister und die Wasserschutz und hat mit mir gemeckert. @(Ne.)@ //@(.)@// @(war- war)@ (1) Ne, weil ich da als Jung nun am fischen war. //hm// N=hat mein Vater mich auf diesen Lehrgang geschickt, (.) Und damals durfte man ja noch zwei Stellnetze fischen. Und das ham se ja so n Stück für Stück weggestrichen. (1) Zwei Stellnetze, 100 äh Haken, So an der (.) Langleine, (1) Und äh:, (.) vier Aalreusen. (.) So. N na weder vier einzelne oder zwei doppelte. //hm// So. Und erst ham se die Stellnetze weggestrichen, und

jetzt über die Jahre ham se die Aalhaken auch noch weggestrichen, jetzt darf man nur noch die Reusen fischen. Mit diesem Fischereischein. //hm// So a- Hobbymäßig. (.) Ne. (2) Ja, und=dann bin ich da so: mit reingeschliddert, ne. (1) In die Fischerei. ((Kind und Mutter brabbeln im Hintergrund, 2)) Familienbelastet. Als Kind musst ich bei meim Vater sowieso immer mit, (1) Die Sommerferien waren immer schön. (1) Mein Vater freute sich, dass er (.) Hilfe hatte. //hm// Alle andern lagen am Strand und ich hab die kompletten sechs Wochen auf m Kutter verbracht, ne. //@(1)@// Wir sind a meistens nach Dänemark gefahren, Gleich. Am am letzten Schultag- (2)

[…]

F12: Ähm. (1) Meistens am letzten Schultag schon. Mein Vater hatte schon alles klar gemacht, //hm// und dann sind wir mit m Kutter hoch, und haben dann im Kattegat oben (1) von Læsø aus gefischt, (1) nach Seezungen, //hm// (.) mit Stellnetzen, (1) und dann hab ich da den ganzen Sommer verbracht. Auf m Kutter @(.)@ (1) @(In Dänemark, im Hafen. he)@ (1)Ja:. (1) Und dann pünklich, wie die Schule wieder losging, waren wir wieder da. (.) Das warn meine Sommerferien. //@(.)@// (1) @(hura::)@(1) Ja de-. (1) Damit groß geworden, ne. //hm// (.) Immer mitgefahren, (.) Die haben mich ja immer mitgenommen. (3)

I: Und dann kam die richtige, Lehre.

F12: Dann kam die richtige Lehre, ja. (.) Ja. (1) Und dann hab ich das gelernt. (2) Und da alles gemacht, ne. (.) Patente, //hm// Meisterbrief, (2) Und dann (.) eigenen Kutter, (2) So wie das halt so is, ne. (2) Und nu fährt man fischen. //@(.)@// @(.)@ (2) ja.

I: Könn se mir dazu n bisschen mehr erzählen? Seit se rich- richig, ich sag mal richtig angefangen haben? Wie hat sich das dann entwickelt? Is das jetzt noch n n geerbter Kutter gewesen, oder: ~sind de selber:.

F12: ~Nee. Ich hatte mich:: mit meim Vater- Ich bin ne ganze Zeit lang bei meim Vater gefahren, (1) So. Und wie das dann immer so ma bei Vater und Sohn is, dann haben wir uns in die Haare gekriegt. So. Und dann haben wir ha- weiß nich. (.) fast zwei Jahre nich mitnander geschnackt. Das ging immer nur über meine Mutter. (.) So und in der Zeit, bin, ich, auf, mehreren Kuttern gewesen. Aber (2) Also eigentlich nur auf Krabbenkuttern. //mhm// Ich hab mir dann mal ganz was anderes angeguckt. (1) Ich hab ja hier: äh: (.) bei

meim Vater ham wir- Der hatte so n kombinierten Kutter mit Stellnetzen und Schleppnetze. //mhm// (1) Und äh (.) dann bin ich an die Nordsee #00:05:26-2# rüber, (1) Also ich kannte da ja auch vom Fischereischule her, m=n haufen Leute, (1) Und äh, der eine, der we- der is der Decksmann, der hatte grad n Motorradunfall, und der suchte dringend Ein, (.) Und dann bin ich da mitgefahren. Und dann war der nachher wieder gesund, und wieder da, und ähm: ich kannte da ja nachher schon sämtliche, und dann (1) bin ich da solange auf m Krabbenkutter gefahren, (.) bis ich mich dann mit meim Vater @(wieder ö- verstanden hatte)@ //@(.)@// Ja, und dann bin ich wieder hier gelandet. (2) Ja. (2) Auch mal was anderes angucken. //hm// Ne.

I: Und dann aber hier dann mit nem eigenen Kutter? Oder wieder (.) beim Vater ~mit.

B: ~Ja, nee. Mein Vater hatte sein verkauft und und- Also ne Zeit lang hatten wir zwei Kutter. Mein Vater hatte sein und und ich hab ein. //hm// Also n kleineren. (1) Ne, also da haben wir ein bauen lassen, (1) Und dann (.) sind wir mal mit dem Großen, mal mit dem Klein, Und und. (.) Ja. (1) Da hat mein Vater nachher sein verkauft und hat aufgehört, und in Rente gegangen, Also er hat gefragt, ob ich den Großen behalten will. Aber: ich hab dann lieber den Klein behalten. #00:06:35-7#

I: Der Kleine war der Neue.

B: Der Neuere. //hm// Ja.(2) Ja, weil- Also die Situation in der Fischerei is nun mal: (.) nich grade rosig, (.) Und (.) In den zwei Jahren, wo ich: nich bei meim Vater war, is das Hauptproblem gewesen, jemanden finden, der mitfährt. //hm// Also in der Zeit hat er glaub ich: fünf oder sechs Leute durchgeballert in den zwei Jahren. Weil die einfach (.) Wenn gute Fischerei da war, (.) und Geld zu verdienen war, (.) dann is das so. Dann kann man nich auf Geburtstage, und auf F:eiertage und wer weiß was gucken, Da muss man nach schönem Wetter gehen, //hm// und dann muss das los. Und dann, jetzt sind Fische da, (.) und jetzt müssen wir n Schlag reinhauen. Jetzt muss das in de Gang."

(F12, Paragraph 7 - 15)

Appendix E – F4: biographical introduction

Interviewerin: erzähln se weiter sie hams vorm- von ihrm Vater übernommen.

F4: ja. und ähm ich kenn das so von meim von meim Vater ich bin ja auch damals mit meim Vater gefahn, und auch die ersten Jahre wie ich selbstständig war, //hm// äh da wurd im Winter gefischt ne, und da gabs kein schlechtes Wetter da, da wurd n Schlach reingehaun, ich mein das hat nich jeder so gemacht aber ich:, wir ham das damals so gemacht, wir ham im Winter unsern Umsatz gemacht und na, und da k- gucken was denn: Rest des Jahres bringt ne. " […] (.) wie gesacht, äh, mein Vater is Fischer, es is nicht mein (.) mein richtiger Vater, wir komm eig- ursprünglich aus ORT A (.) und. äh. mein, mein richtiger Vater is (.) ganz früh verstorben. (.) und meine Mutter hatte halt (.) hier in ORT B, da, mit dem hamse ja auch schonma Kontakt mit Name1 , das is mein //@(ja:)@// mein Adoptivvater praktisch.[…] (.) also. (.) gut. naja also ähm: ich war damals (2) °ich war damals°, fünf sechs Jahre als mein Vater starb und, ähm (.) die ham sich dann eben, kennengelernt meine Mudder und, Name 1 eben und, dann sind wir, (.) auch relativ schnell nach ORT B gezogen. (.) ja, und denn warn wir drin inner Fischerei, ne, und (.) nach der Schule (.) stand es erstmal für mich fest, dass ich: (.) das, nich machen will. ne. ich sah mein Vadder immer nur Tag und Nacht arbeiten und na: (.) und also für mich, stand fest mit, mit 16 Jahrn (.) da gibts auch noch was aneres @(.)@ naja und dann bin ich aber doch irgendwo (2) mein Gott wann war das. JAHR1? JAHR 1, ja. JAHR 1 verstarb mein Bruder. (2) und denn. bin ich. doch irgendwie: (.) bei ihn an Bord gekomm, (.) hatte damals wohl auch (.) keine Arbeit=n mn war jung und hatte auch irgendwo, (.) n (.) naja muss ich ihn nich- wahrscheinlich nich viel erzählen (Geraschel) auch andere Sachen im Kopp, ne? (.) Naja und denn stand eigentlich für mich am=am ersten Tach fest, wo ich immer gesacht hab, Fischerei kommt für mich überhaupt nich in Frage, am ersten Tach stand für mich fest dass:, das muss ich machen. weil das is das will ich. ne, (.) und, so kam ich zur Fischerei. un dann bin ich irgendwann nach ORT C und hab hier auf m größeren Kudder als Decksmann gearbeitet, auf der NAME 2 (2) und, bin °da sieben°. sieben acht Jahre lang gefahrn, (.) und dann hab ich: a:ls (.) Quereinsteiger, (.) musst ich ja um=um, dieses Fischereipatent zu machen muss ich ja nen seemännischen Beruf lern, //hm// (.) hab ich als Quereinsteiger, ähm, mein Fischwirt gemacht, (.) und das Jahr drauf

mein (.) Patent, (.) und dann hat mein Vadder mir das Schiff übergeben. (.) ne, (.) das war (2) ja, das war, also (.) er fischt ja mit, er fischt ja immernoch, //hm// is: °ich glaub er is 60 irgendwas(.) und kann sich natürlich auch kann auch nich loslassen. und das, also ich sach heute (2) ähm, dieses Schiff das: das war sein Lebenswerk ne, es wirklich, also (.) er (.) er hat mir damals die die die Aussicht gegeben, mach deine Zettel mach dein Patent, und dann krichste das. krichste das Schiff. aber ich glaub, er hätts auch g=gerne, fünf sechs Jahre später abgegeben ne, (.) ja und, das war Ende 2008, (.) und seit dem bin ich selbstständig. (.) hier in ORT C inne Genossenschaft mein Vadder war im ORT D in der Genossenschaft, liecht- hat von ORT B gefischt aber (.) in ORT D inner Genossenschaft aber da ich hier, gewohnt hab, //hm// gabs eigentlich für mich keine (.) keine Alternative wie ORT Cne, (2) und ich glaub das war auch der richtige Weg. //hm// (.) ORT B is ja doch ne:, grade n diese Eigenvermarktung, di=w die wir ja machen müssen, //hm// anders funktioniert das ja mittlerweile gar nich mehr, (.) ähm. hier sind dann doch mehr (.) mehr Publikum und (.) mehr potentielle Käufer, wie in ORT B ne, //ok// (2) jo. (2) ja und seit dem (2) müssen we uns damit rumärgern. @(.)@ //@(.)@// aber ich ärger mich gerne

Interviewerin: @(is gut)@. und äm ham sie dazwischen denn noch was anderes gemacht zwischen der Schule und ~dann der. Fischergeschichte?

F14: ~ja ich hab 14 Jahre was anderes gemacht //hm// ja. und dann kam die Fischerei.

(F14, Paragraph 12 - 20)

Appendix F – F18: procurements

Na für den Betrieb- ich hab- ja ich fing ja mit einem ganz kleinen Boot an, mit einem klein sechs Meter Boot, //okay// Das hab ich günstig- mein Vater wollt es mir erstmal nur so leihen (.) Und dann, äh, (.) merkte ich, ne das kaufst du kurz //@(.)@// und er hat mir das dann auch verkauft. (.) Äh, ja und (.) 1 Jahr später, (.) hat ich schon (.) das etwas größere Boot, das acht Meter Boot. Ich fisch ja von (.) zwei Häfen von, //mhm// einmal von ORT X (.) und einmal von ORT Y (1) Und: (1) ähm (.) weil weil es war wirklich n sch-, (.) warn gute Jahrgänge. Es fing ganz gut- ich hab- n ganz glücklicher Start //hm//, das ganz ganz wichtig, sonst hätt ichs auch gar nicht geschafft. Wenn Geld reinkommt, kannst du- kann man da auch was mit machen ne? //hm// Ne, und ja, (.) Gab noch ne kleinere Förderung damals, ich war: zufällig arbeitslos (.) in der Zeit:, (.) als ich das Patent machte. //hm// und, (.) Aus der Arbeitslosikgeit in die Selbstständigkeit, dafür gab es damals n bisschen Geld, //hm// Und, weiß nich, is=s vermutlich heute immer noch so, dass es da ne kleine Förderung gibt. Und, ja, von dem Geld konnt ich mir schonmal Netze kaufen, das war schon gar nicht so schlecht. //@(.)@// ja. (.) ne, Weil das war grad, war auch grad die Zeit, (.) als das mit der Familie losging und ja (.) Haus kaufen und alles- das belastet dann doch. //hm// Ja, und wenn dann n bisschen mehr Geld reinkommt, ist das schon ganz gesund und ganz, ganz nett. Ja und dann: ähm (2) tauschte ich das kleine Boot, oder das kriechte mein Vadder wieder, hatte ich mir ein neues sogar gebaut. Also das waren, waren etliche gute Jahre. (.) Als, als zweites Boot. ORT X hat den Nachteil, da: (.) kämpfen wir oftmals mit dem Wasserstand, //mhm// durch Versandung. //hm// Und dann is es ganz, ganz gut, wenn man n bisschen weniger Tiefgang hat. (.) Und deshalb hab ich mir das Boot gekauft und manchmal hat mich das dann (.) ja, n paar Jahre später doch ziemlich genervt. (.) Weil dieser Teifgang dann auch nicht ausreichte, n- (.) zu viel Sturm (.) und ich denn (.) ein Boot in der ORT X, entweder du schaffst es, oder du schaffst es nicht. […] Das war, war eigentlich so weil, mein Standort ist ja hier. (.) ne, bei ORT Z ebend. Ich hab zuerst in ORT Z gewohnt, //hm// U:nd (2) ja, dann hab ich mich dafür entschieden, in ORT Y n Kutter zu kaufen. Das ist ja, man kann ja nicht einfach n Kutter kaufen, //hm// das kann man schon, aber dann kann man auch nichts mit dem anfangen, //@(.)@// man braucht ja ne Quote //hm// ne. Und und, (.) das ja. Und (.) die musst du- (.) muss man eben mitkaufen, praktisch. ne. //hm// Und (.) das hab ich dann

damals auch gemacht. (.) Bisschen das Sparschein auseinander gehaun (.) und konnt ich so bezahlen. Ich ich denk mal, da hab ich- das hab ich auch richtig gemacht, mein Betrieb war eigentlich immer, immer bezahlt (1) und- (1) is doch n bisschen kühl ne? //No// […] Ja, dann kam der Kutter irgendwann in ORT Y mit Quote. (1) Und, (.) die Quote hab ich (.) nicht einmal ausgefischt. //@(.)@// Die wurd dann sogar nachher gekürzt. Ich war mit dem Fahrzeug nicht zufrieden. //hm// Hab das dann nochmal umgetauscht, n Ähnliches. Und, (.) in ORT T wurde der (.) andere Kutter (.) dann nochmal umgebaut. Der war früher- ich kannte den als als Kind schon, den Kutter. Das is, ja, Baujahr 1980. (.) ne, (.) Älter als Sie vermutlich. Ja, //n@(1)@// (.) U:nd (3) der war dann (.) in z- in ORT S hab ich ihn gesehen, in ORT Y und und den fand ich immer gut, den Kutter. Und, (.) ja dann, hörte ich dass- oder sah ihn durch Zufall in ORT T weil ich da Urlaub gemacht hab. //hm// Ich denk, Mensch frag doch mal, (.) und (.) der war tatsächlich noch zugelassen. Der war noch nicht komplett aus der Fischerei raus, und den konnt ich dann tauschen. Gegen den- die warn ungefährt gleich groß die Kutter,"

(F14, Paragraph 23 - 25)

Appendix G – F12: complementary livelihood

F12: Wann denn, ja. (2) Das Schöne is, beim Staat is ja alles möglich, ne. //@(1)@// Man kann ja, äh, (2) Also. (2) Dadurch dass ich mir keine Überstunden auszahlen lass, und den ganzen Urlaub, Und wenn ich dann da alles so zusammenrechne, ich komm auf n halbes Jahr frei. (1) //mhm//[…] Und, dann isses ja so, wir haben ja noch zwei kleine Kinderchens, ich kann bis::: zum achten Lebensjahr, (.) pro Kind drei Jahre frei machen. //hm// (1) Kann ja das erste Jahr- //Die Elternzeit, ne, ja.// Das erste Jahr, das das Geld nehmen, und oder- (1) volles Geld, oder zwei Jahre das halbe Geld, und. (1) Ma kann ja da frei machen. Ganz entspannt, ne. //@(.)@// (1) rechzeitig anmelden, (.) un=dann kann man ja immermal n halbes Jahr zu Haus bleiben noch. //@(.)@// @(.)@ (1) //@(.)@. Ja, das stimmt.// Ja, und dann kann man ja noch weiter fischen fahren.[…] . Bin ja da durch n Zufall mal gelandet.

Interviewer: Wie kam das?

B: Ja, na wie ich auf m auf m Krabbenkutter da ma gefahren bin, äh, und. (2) Da hat einer den den Kutter als Vertretung gefahren, (3) Und äh: der war auch bei FIRMA A (1) Und, der sagte mir=ja, Mensch. Sag ma, hast nich ma Lust nochmal irgendwie was anderes zu machen? Ma n paar Seekarten? (2) So. Keine Ahnung. Weiß ich nich. Eigentlich will ich doch fischen fahren. Ja, wir suchen da grad jemanden. Hier, is die Adresse, schreib ma ne ne Bewerbung hin. (2) Ja. (2) Hab ich da ne Be- Bewerbung hingeschrieben, (2) Was ich alles so gemacht hab, (3) Ja, dann tat sich drei Monate nichts. (1) Oder dreinhalb Monate, (2) Und dann kriegte ich Bescheid, ich soll zum Vorstellungsgespräch kommen. Nach ORT D. //hm// (1) Ja. (.) Da bin ich dahin gewesen, mit mein Arbeitsklamotten. //@(.)@// Mit meim Blaumann. (2) w grade so, dass ich die Gummistiefel @(ausgezogen hatte,)@ //@(1)@// @(aber-)@ (2) Naja. Dn=n. (.) Ganz normal mit Arbeitsklamotten hin und dann komm ich dahin. Und dann stehn da irgendwie 20 Leute, mit Schlips und Kragen, (2) Denk ich dann, wo biste hier denn gelandet. @(.)@ Und dann bin ich da rein, bei den, (2) Und dann saßen die da in großer Runde, und ham mich dann befragt […] und dann war auf meinem Anrufbeantworter ne Nachricht, //@(.)@// (.) rückwi- eine Stunde rückwirkend, //@(2)@// @(1)@ äh, Sie könn sofort anfang @(3)@ //@(3)@// Ja. @(.)@ So. Und dann bin ich da bei Firma A angefangen. “ (F12, Paragraph 138 – 140)

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