

Bachelor Thesis

An analysis of the German Brown shrimp fishery MSC certification process



17th June 2013

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THÜNEN

Bachelor Thesis

An analysis of the German Brown shrimp fishery MSC certification process

A study about the current situation and recommendations
for the German Brown shrimp fishery in the MSC
certification process

A thesis submitted in fulfilment of the requirements for the degree Bachelor Coastal Zone
Management on behalf of the Thünen Institute (TI)

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Front image by Birgit Suer: German Shrimp vessel fishing in the Wadden Sea (Lower Saxony) close to the lighthouse 'Hohe Weg'

University of Applied Sciences



Preface

This thesis was produced with support of several people whom we would like to express our gratitude. We would like to thank Dr. Ralf Döring from the Thünen Institute for giving us support and the opportunity to carry out this research project. Further we would like to thank our supervisors Evelien Jager and David Goldsborough for giving us valuable feedback and support during the whole process.

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Summary

The German Brown shrimp fishery occurs mainly in the shallow Wadden Sea where large concentrations of Brown shrimp (*Crangon crangon*) can be found. The Wadden Sea is an ecologically important nursery area for several flat fish and round fish species. In the European Union the Brown shrimp fishery is one of the fisheries which have besides technical regulations no restrictions. There is no common management and no limitation in landings, fishing effort and no quota scheme.

In January 2010 177 German shrimp fishermen applied for the Marine Stewardship Council (MSC) Certification to ensure that the impacts of the fishing activities on the environment are kept low as possible and to create a stable market price for the sector. The German Brown shrimp fishery is still in the process of obtaining the MSC certification. Since the application in 2010 the structure and the situation of the German shrimp fishery changed a lot. Since 2011 a management plan is in force, which was designed by the Producer Organisations of the Brown Shrimp fishery. This management plan contains measures where each fishery business has declared in a contract with their PO to follow the management measures in the management plan.

The recent changes in the structure of the organisation of the shrimp fishery required a study of the new situation and therefore interviews with involved stakeholders and literature research was conducted. This study aims to provide recommendations to the German Brown Shrimp fishery in order to successfully obtain the MSC eco label.

The average MSC process takes approximately 17 months where the fishery has to pass a full assessment. The fishery is scored against three core principles of the MSC standards which investigate the target species stock (principle 1), the impact of the fishery on the environment (principle 2) and the fishery management (principle 3).

One reason for the stagnation of the MSC process is a missing reliable stock assessment of the target species because a common stock assessment can not be carried out for the short living species Brown shrimp. Additionally there is no uniform data collection process for Germany, Denmark and the Netherlands, which causes problems of data processing because the stock population along the coast is estimated as one.

The bycatch of juvenile organisms is an issue for the Brown shrimp fishery. Research until now showed that most juvenile round fish do not survive the fishing process.

Another point is that a new management plan was introduced in 2011 which takes longer to implement as there was no common management before. The organisational structure of the fishery

was insufficient to regulate the overall management because many Producer Organisations dissolved in the last years.

Recommendations, which can be given to the fishery to receive the eco label, are a uniform data collection for the stock assessment and an overall institution for data storage. In that way it will be possible to include all data from the different countries to calculate the stock number. Another recommendation is to carry out more research on fishing methods, which can reduce bycatch and minimize the effect on the sea bottom. In general it is needed to invest more in research to get an understanding of the effects on the environment. Another recommendation is to form one overall Producer Organisation for the Brown Shrimp fishery with a stronger enforcement structure. Also a better communication between all stakeholders is recommended especially between NGOs and fishermen.

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Glossary

BLE	Bundesanstalt für Landwirtschaft und Ernährung (German Federal Agency for Agriculture and Nutrition)
BMELV	Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (German Federal Ministry of Nutrition, Agricultural and Consumer Protection)
Bycatch	Bycatch includes all non-target species and unwanted target species in the catch
CFP	Common Fisheries Policy is the fisheries policy of the European Union (EU)
DCF	Data Collection Framework, formerly DCR (Data Collection Regime)
Discards	The fraction of the by-catch that is disposed over board. It may include target species and non-target species
e.G.	Eingetragene Genossenschaft (registered cooperation) is a legal status for cooperation in Germany which promotes the common trade
e.V.	Eingetragener Verein (registered association) is a legal status for a registered voluntary association in Germany
ETP	Endangered Threatened or Protected species as defined by the MSC. MSC defines ETP which are recognized by national legislation and binding international agreements such as CITES therefore non-binding lists such as the IUCN Red List are not included
EU	European Union
FAM	Fisheries Assessment Methodology provides the detailed interpretation of the fisheries standard
FAO	Food and Agriculture Organisation of the United Nations is a specialized agency of the United Nations that leads international efforts to defeat hunger
Gadoid	Fishes relating to the family of Gadidae which includes cod, haddock, and hake
GmbH	Gesellschaft mit beschränkter Haftung (company with limited liability) is a corporation form in Germany where members are stated as shareholder (Gesellschafter)

ICES	International Council for the Exploration of the Sea (founded 1902 in Copenhagen) coordinates and promotes marine research on oceanography, the marine environment, the marine ecosystem, and on living marine resources in the North Atlantic. All nations bordering the North Atlantic are members
Knot	Knot is a unit of speed at sea that equals to one nautical mile (1.852 km) per hour
LPUE	Landings Per Unit Effort is a method to calculate the relative abundance of fish, where landings = weight of fish landed, and effort = time taken to fish
LWK	Landwirtschaftskammer Niedersachsen (Chamber of Agriculture of Lower Saxony) is a self-governing organisation. Their legal status is a statutory corporation (Körperschaft des öffentlichen Rechts) and is under legal supervision of the Niedersächsische Ministerium für Ernährung, Landwirtschaft, Verbraucherschutz und Landesentwicklung
MSC	Marine Stewardship Council is the certification and eco-labelling program for sustainable fish products.
Natura 2000	Natura 2000 is an ecological network of protected areas within the European Union
NGO	Non-governmental organisations are organisations that are not a part of a government and are not conventional for-profit businesses
NMa	Nederlandse Mededingsautoriteit (Netherlands Competition Authority) is the competition regulator for the Netherlands.
PI	Performance Indicators provide performance requirements for fishing impacts detailed in the evaluation tables for each of the three MSC principles.
PO	Producer Organisations are cooperation between fishermen to manage their resources in an economic and ecological way
RBF	MSC Risk-Based Framework is a set of assessment methods contained in the FAM. It is used while carrying out an MSC fishery assessment where there is insufficient data to assess the fishery using the standard assessment tree
RESCUE	Research into Crangon fisheries unerring effect was an EU Project to obtain more accurate information on the extent of the by-catch problem in the brown shrimp fisheries

SAC	Special Areas of Conservation are protected sites designated under the EC Habitats Directive
SPA	Special Protection Areas are protected sites classified in accordance with the EC Birds Directive. It is in force since April 1979
TAC	Total Allowable Catch is a catch limit for a commercial species which is given to each country
Target species	The species which a fishery targets
TI	Thünen Institute (Federal Research Institute for Rural Areas, Forestry and Fisheries) is a German research institute under the umbrella of the German Ministry of Food, Agriculture and Consumer Protection (BMELV)
UNESCO	
World Heritage	United Nations Educational, Scientific and Cultural Organisation is aiming to ensure the identification, protection of natural and cultural heritage and preservation around the world
w.V.	Wirtschaftlicher Verein (economic association) is a legal status for small economic associations in Germany
WGCRAN	ICES Working Group on Crangon Fisheries and Life Cycle

1. Introduction

The German Brown shrimp fishery has a long tradition and presents a significant economic value to the fisheries sector. It also plays an important role for characterizing the identity of the fishery regions and for the tourism, which is the economic mainstay in these German coastal areas. (Aviat et al., 2011) The fishing occurs particularly in the shallow Wadden Sea which inhabits a large concentration of Brown shrimp and presents ecologically important nursery areas (Figure 1). The Brown shrimp (*Crangon crangon*) is a strongly reproductive crustacean with a short life span of about one to three years (Aviat et al., 2011). Since 2009 the Wadden Sea is partly assigned as a World Heritage Site by UNESCO because of its unique tidal landscape. Fishing takes place in Natura 2000 areas and in the German National Parks (Schleswig-Holsteinisches-, Hamburgisches- and Niedersächsisches Wattenmeer). The majority of the European Brown shrimp fishery (95% of the total North Sea production) occurs, besides Germany, in the other littoral states of the Wadden Sea: the Netherlands and Denmark (ICES, 2010).



Figure 1 Shrimp fishing area (orange) in the North Sea (green area represents closed zone for shrimp fishery) (Fischer, 2009, modified)

In the European Union the Brown shrimp fishery is one of the fisheries with almost no regulations. There is no common management and no limitation in landings, fishing effort and no quota scheme. ICES (International Council for the Exploration of the Seas) Working Group on Crangon Fisheries and Life Cycle (WGCRAN) annually evaluates the landings of the fishery and their estimations show no sign of overfishing (ICES, 2010). So far the only regulation consists of EU technical regulations (e.g. number of licenses, mesh size and area restriction) and national rules (e.g. area closures) (Aviat et al., 2011).

Environmental Non-Governmental Organisations (NGO) do not consider the Brown shrimp as threatened but are concerned about the bycatch and the damage the beam trawls do to the sea bottom (Fischer, 2009). The World Wide Fund For Nature (WWF) has put the North Sea Brown shrimp in the orange column (second choice) of their fish-purchase guide and Greenpeace Germany does not recommend (red sign) to buy North Sea Brown shrimp (WWF, 2011; Greenpeace, 2013).

The marketing of the Brown shrimp is mostly dominated by two Dutch companies, Heiploeg and Klaas Puul (90% of the trade volume). This oligopoly structure of the market promotes a biased price formation. (Aviat et al., 2011) To balance the shrimp market price, fishermen are organised in multi-regional Producers Organisations (POs). These POs develop agreements between members such as limitation of fishing days (e.g. no fishing on weekends). In the year 2010 most German fishermen were member of one of the eight existing POs. Dissensions between POs and the fear of intervention by the Dutch Competition Authority (NMa) considerably limited the POs influence and the establishment of a common management approach. Further over the last years the POs reorganised constantly and agreements set up by the POs, are often not followed by their members. (Aviat et al, 2011) In the year 2011 the price for shrimp collapsed and many POs broke up. At the end of 2012 a new Producer Organisation called „Erzeugergemeinschaft der Deutschen Krabbenfischerei GmbH" was founded which includes 100 German fishing vessels. Together they constitute for more than 50 % of the German shrimp landings and 20 % of the European landings. (Nds. Ministerium für Ernährung, Landwirtschaft und Verbraucherschutz, 2013)

In January 2010 177 German shrimp fishermen applied for the Marine Stewardship Council (MSC) Certification to ensure that the impacts of the fishing activities on the environment are kept low as possible and to create a stable market price for the sector (Bundesforschungsinstitut für Ländliche Räume, 2012; Marine Stewardship Council 2, 2011,). The average certification process duration time is estimated at about 17 months. Until now the German Brown shrimp fishery is still uncertified.

The German Brown shrimp fishery process of obtaining the MSC certification has been running for 41 months. In 2010 they planned to receive the certification in March 2011. (Marine Stewardship Council, 2011) Due to missing information about the North Sea Brown shrimp stock and a missing management plan in the beginning, the MSC process finishing date was rescheduled three times. Additionally the structure of the German shrimp fishery changed a lot during the process and a proper organisation is essential to enforce measures which are necessary to receive the MSC certification. Some of the former Producer Organisations (POs) do not exist anymore however a new PO was established at the end of 2012 which comprises many fishermen. Furthermore the fishery implemented a management plan to meet the MSC criteria. The recent change in the structure of the organisation of the shrimp fishery requires a study of the new situation.

In order to provide more information about the current situation of the MSC process of the German Brown shrimp fishery a study was made and recommendations were collected for the German shrimp fishery how to successfully receive the MSC certification.

This research aim directly leads to the research question:

Which recommendations can be given for the German Brown shrimp fishery in order to obtain the MSC certification?

The sub questions below will help to answer the research questions:

1. *What are the requirements of a MSC certification process?*
2. *What is the current situation of the German Brown shrimp fishery?*
3. *What is the current situation of the MSC process in the German Brown shrimp fishery?*
4. *Which explanations can be given for the delays of the MSC certification process for the German Brown shrimp fishery?*
5. *Which measures does the shrimp fishery need to apply in order to receive the MSC certification?*

In order to answer the research question a study about the MSC process of German Brown shrimp fishery was conducted. Next to an extensive literature research, interviews presented an important method to gain information of the main obstacles of the Browns shrimp fishery in the MSC process and possible recommendations for the on-going MSC process. Interviews were conducted with researcher, representatives of NGO, MSC and the coordinator of the German Brown Shrimp fishery MSC certification process (Appendix II). The information of the current situation was difficult to gather because recent changes are barely published. Therefore these information were mostly obtained in the interview with Philipp Oberdörffer (LWK) who is the coordinator of the German Brown Shrimp fishery MSC process. The questions during the interviews followed a list which was based on the three core principles of MSC (Appendix I). The interviews were conducted in German and summarized in English (Appendix III – VII). The explanations for the stagnation and the recommendations were colour-marked to divide the information between the three principles (Appendix II).

The first part of this study contains an analysis of the requirements of the MSC certification process (Chapter 2). The analysis provides insight in the whole process and the seven certification stages, which is essential for understanding the further analysis of this study. The information was gained mostly through documents from MSC, which are provided on their website. The second part (Chapter 3) provides an analysis of the current situation of the Brown shrimp fishery in the MSC certification process. This part contains information such as the latest research findings and the shrimp fishery situation (e.g. discard, management) which are relevant for the MSC process and also how the fishery is currently organised. Essential for this part was the information gained from the interviews due to the fact that detailed and recent information can hardly be found in literature.

This chapter also matches the information about the current situation of the Brown shrimp fishery to the requirements of the MSC certification. This indicates on which standards the MSC process of the German Brown shrimp fishery possibly stagnates. The third part of this study (Chapter 4) provides an analysis of the reasons for the stagnation in the German Brown shrimp fishery in the MSC certification process. The results from the analysis of the previous chapter were used as foundation. Further the answers of the interviews provided additional information to the analysis. The fourth part of this research (Chapter 5) is a collection of possible recommendations for the German Brown shrimp fishery to obtain the MSC certification. The explanations given in the previous chapter form the foundation for the provided possible recommendations on how to obtain the MSC certification. At the end of the report an overall conclusion is given.

2. Marine Stewardship Council Certification process

This chapter deals with the MSC certification process and its requirements, which are all linked to three core principles set in the MSC standards. The information below provides a general guideline of the MSC certification process which each fishery has to undergo.

2.1 Principles of MSC

The Marine Stewardship Council (MSC) is an independent international organisation founded to preserve ocean resources and support their sustainable management. The certification label ensures the observance for sustainable caught fish by following set standards which are orientated on international criteria of the Food and Agriculture Organization of the United Nations (FAO) and other international conservation instruments. (Marine Stewardship Council 1, 2010)

Under the MSC standard for sustainable fishing a fishery is measured against three core principles:

“PRINCIPLE 1: <u>The Stock</u>	PRINCIPLE 2: <u>Impact on the Environment</u>	PRINCIPLE 3: <u>Fishery Management</u>
A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.	Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.	The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.”

(Marine Stewardship Council 1, 2010)

The three MSC principles are supported by 9 criteria which are split into 31 Performance Indicators (PIs). (Appendix VIII)

2.2 Scoring procedure

During the full assessment the fishery is scored against the 31 PIs. Each PI is scored out of 100 points. To receive a positive result the PIs need to achieve a score of 80 points or more. A fishery which scores higher than 60 but less than 80 points on one or more PIs will get the certification but needs to undergo improvements within a specific timeframe. Each Performance Indicator is divided into several criteria which are scored individually.

A detailed guidance of how to score a fishery against the standard is provided in the so called Assessment tree. The Assessment tree for the German Brown shrimp fishery is the MSC Fishery Assessment Methodology version 2 (FAM v2) (Marine Stewardship Council 2, 2010). In the absence of sufficient data, the Risk Based Framework (RBF) can be used instead of the scoring methodology of the standard Assessment tree (FAMv2). This Risk Based Framework can be only used for some Performance Indicators of Principle 1 and 2 (target species, by-catch and retained species, as well as habitats and ecosystems). The certifiers are assessing the risk that a fishery is operating unsustainably with regard to individual Performance Indicators. An important part in this method is stakeholder involvement. Stakeholders provide their knowledge on the impact of the fishery to the certifier who will use the information to identify the potential risk of the fishery. (Marine Stewardship Council 2, 2010)

2.2 Certification process

On average the MSC process takes 17 months but it can vary a lot, depending on the preparation and the complexity of the fishery. A fishery which applies for the MSC certification needs to pass a pre- and full assessment. In the pre-assessment qualified certifiers evaluate the fishery performance against the MSC certification criteria. This helps to detect the main issues in the fishery performance and it will help the fishery to prepare for the full-assessment. (Marine Stewardship Council 1, 2011)

The full assessment includes seven stages/steps which the fishery must run through before receiving the MSC certification. The assessment of the fisheries is carried out by independent certifiers ("Food Certification International" for German shrimp fishery). (Marine Stewardship Council 1, 2010)

The 7 steps to certification:

"Step 1: Fishery announcement and assessment team formation"

Step 2: Building the Assessment tree

Step 3: Information gathering, stakeholder meetings and scoring

Step 4: Client and peer review

Step 5: Public review of the draft assessment report

Step 6: Final report and determination

Step 7: Public certification report and certificate issue “

(Marine Stewardship Council, 2013)

After completing the full assessment successfully and being awarded with the sustainable status the fishery is certificated for 5 years. During this period the performance of the fishery must be monitored at least once a year. After the 5 years the fishery needs to undergo the full assessment again to keep carrying the eco label.

To ensure traceability of the product all companies in the supply chain need to be certified according to the MSC chain of custody standard.

3. MSC process of the German Brown Shrimp Fishery

In this chapter the general position of the current German Brown shrimp fishery is analysed in relation to the Marine Stewardship Council (MSC) Principles and Criteria. First a general description will be presented with the organisational structure of the Brown Shrimp fishery. Afterwards the information of the current situation of fishery is discussed according to the three core principles of MSC. Every section includes a short description of the requirements and criteria.

3.1 General information

With the application for the MSC label the brown shrimp fishery experienced a reorganisation of the fishery. This was a needed measurement because within the common fisheries policy (CFP) there are besides technical measures no restrictions for the brown shrimp fishery. This involves that there are no constraints in fishing effort and catching quota. CFP only sets catching quotas to a fishery for biological reasons (stock depletion). (Deutscher Bundestag, 2011) As the shrimp stock is estimated to be in good state, there is no reason for establishing these regulations. (Aviat et al., 2011)

With the admission to the MSC certification it is required by the standards that the fishery has a proper management plan which shows that the fishery is sustainably organised and a precautionary plans exist. In 2011 the existing German Producer Organisations developed a management plan “Management plan der deutschen Nordseegarnelenfischerei” for the German Brown Shrimp fishery, which is an agreement between the German Brown shrimp fishers who are currently involved in the MSC process. The fishermen who did not apply for the MSC label are not following the measures of this management plan. For those fishers only the existing laws (national/international) have to be followed which is controlled by the fisheries departments.

The decision for the MSC certification is made by each fishery business on optional basis. The management plan is in force since 2011 and is carried out by the participating fishery businesses. This plan contains more and stronger measures than the existing laws require. The Landwirtschaftskammer Niedersachsen (LWK) (statutory organisation) supervises the management plan of the German Brown Shrimp fishery and provides an independent inspector. The Producer organisations themselves are responsible for the implementation of the management plan. Additionally each fishery business has declared in a contract with their PO to obey all management measures. The LWK Niedersachsen is in charge to conduct regular controls at the fishery businesses to see if the fishery obeys the management plan. The management and the MSC certification are financed by each fishery business that applied for the eco label. This contribution is also used for

independent controls, participation on scientific projects and public relations. (Management plan, 2013) This plan was designed without a former management plan in place therefore changes and adaptations to the management plan are still taking place since the implementation in 2011. The MSC process of the Brown shrimp fishery is complex and therefore this management is in its early stage of implementation. (Interview Oberdörffer)

The German Brown Shrimp fishery applied in January 2010 for the MSC certification. Until now the German fishery passed stage 1 and 2 of the “7 steps to certification” (see Chapter 2). Stage 3 “Information gathering, stakeholder meetings and scoring” is still in progress caused by lack of information which is necessary for the assessment. The planned site visit was postponed three times due to changes to the management plan / system and a missing stock assessment for the Brown shrimp (Marine Stewardship Council 2, 2011).

The German Brown shrimp fishery is assessed against the standards which are described in the available document MSC Fisheries Assessment Methodology version 2.1. This document presents a detailed guidance on how to score the fishery and an interpretation of the standards. The document is public available at the MSC website (www.msc.org).

Organisational Structure

The fishery is organised in Producer Organisations (POs) which are approved by the European Union. Over the years the number of POs changed constantly (Aviat et al., 2011). Further most of the POs are registered associations (e.V.) which limits their enforcement of measures. Today the fishermen organised themselves in four PO's: Erzeugergemeinschaft der Küstenfischer Tönning, Eider, Elbe und Weser w.V., Erzeugergemeinschaft Elsfleth e.G., Erzeugergemeinschaft Nord- und Ostsee GmbH and Erzeugergemeinschaft der Deutschen Krabbenfischerei GmbH (Interview Oberdörffer). The last PO which was introduced in 2012 is a company with limited liability (GmbH) and has high amount of German Brown Shrimp fisherman as members (Nds. Ministerium für Ernährung, Landwirtschaft und Verbraucherschutz, 2013). Additionally a European PO exists “Europäische Vereinigung der Krabbenfischer – Erzeugerorganisationen” which was founded in 2005 and it coordinates the belongings and management of the POs transboundary. (Management Plan, 2013)

Since 1992 the ICES Working Group on Crangon Fisheries and Life Cycle (WGCRAN) exists, which provides non- political scientific advice for the fishery, to member states, governments and international regulatory commissions.

The LWK Niedersachsen is a statutory corporation which has contracts with the different POs. The function of this institution is to provide advice and is responsible for legislations and regulations in the agriculture sector which includes the fishery. It is responsible for the MSC process and its enforcement. The LWK Niedersachsen is authorized to conduct regularly controls in fishery organisations and businesses. (Management Plan, 2013)

The Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) is responsible for the overall management of the German fisheries. The German Federal Agency for Agriculture and Nutrition (BLE) is in charge for monitoring, control and surveillance of the German fishing fleet.

3.2 Principle 1 - The stock

Under Principle 1 the impacts of the fishery on the target species are investigated. A suitable harvest strategy is in place with regulation to ensure that the harvest of the target species is carried out on a sustainable level. (Marine Stewardship Council, 2010) The section is distributed into the key factors which are relevant for Principle 1.

The Brown shrimp *Crangon crangon*

The Brown shrimp (*Crangon crangon*) is a short-living (1-3 years) and highly reproductive crustacean which occurs in high proportion in the shallow parts of the Southern North Sea. Fishing takes place within the North Sea ICES sub areas IVa, b and c (Figure 2). The highest density can be found in the Wadden Sea. (Aviat, et al., 2011) The shrimp reproduces throughout the whole year, and within a year two different cohorts (spring and autumn) are fished, which seems to be not correlated to each other. (ICES, 2012) From spring to autumn the species stays in the Wadden Sea and moves in the winter to deeper waters. Age determination is not possible because the hard structure gets lost during moulting. (Aviat et al., 2011)

Stock assessment and Stock Status

Due to the biological characteristics of the Brown shrimp (short-lived, highly reproductive) a classical stock assessment is not possible. (ICES, 2012) Further the Brown shrimp population along the Dutch, German and Danish coastline is considered as one stock unit (Interview Oberdörffer). Therefore to calculate the stock status the whole area needs to be investigated.

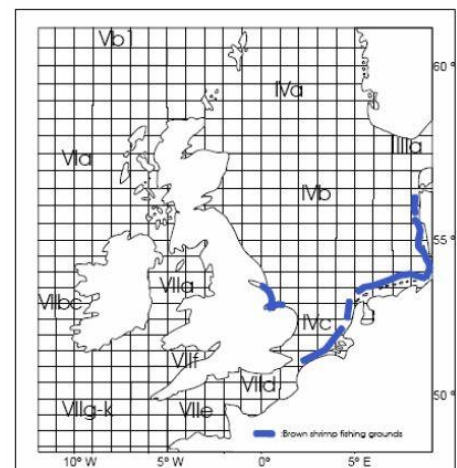


Figure 2 The North Sea (IVa, b, c area) and the major *C. crangon* fishing grounds (Polet, 2003)

The data on Landing Per Unit Effort (LPUE) can be used if biomass data is not available (Neudecker et al., 2007). This method is used in other fisheries to estimate the stock status and can be a suitable approach for Crangon (Neudecker et al., 2011).

Since 1983 it is obligatory in the EU to use a logbook for ships which are larger than 10 meters. Since 2005 Vessel Monitoring System (VMS) data is available (vessels larger than 15 meters) which provide regional and seasonal activity data. With the obtained data the LPUE can be calculated which can provide a tendency of the stock status. A continuous decreasing of the LPUE, which is not caused by natural reasons, would indicate an overexploitation of the stock. Natural factors could be climatic factors, hydrographical conditions and the presence of key predators (cod and whiting) (Neudecker et al., 2007).

The LPUE changed regionally over the years: in the southerly fishing areas the LPUE is declining and in the northerly fishing area the LPUE is increasing. This effect is stated to be a climate effect. (Neudecker et al., 2007)

Neudecker et al. (2007) states using the LPUE data the Brown shrimp stock is in no risk that recruitment is impaired. The annual landings vary from one year to another and show no signs of declining (Figure 3). Based on the observation that the stocks rebuild itself after a low stock level within a year, it is believed that the shrimp stock can be not easily overfished. (ICES, 2011) Further the landings of Brown shrimp increased over the last decades. ICES (2011) states that the main predators (gadoids) of the shrimp have declined as the shrimp landings increased. Therefore if the predator stock increases again it could have an effect on the Brown shrimp stock (ICES, 2011). The predation rates cannot be predicted at the moment. (ICES, 2010)

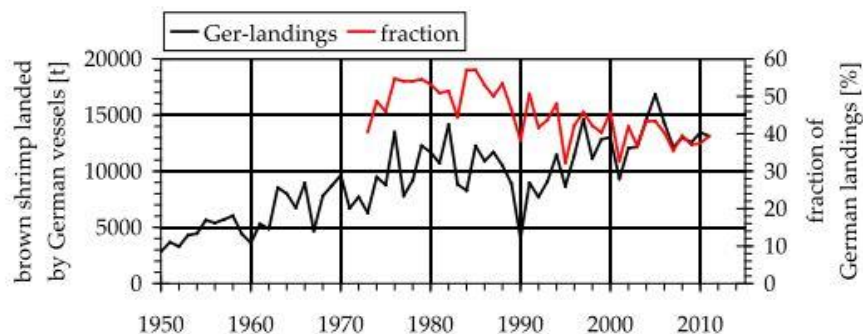


Figure 3 Consumption shrimps landed by German vessels over the period 1950 to 2011 in t (primary y-axis). Percentage of German landings in relation to total landings (whole North Sea, all nations). (ICES, 2012)

Reference points

The German Brown shrimp fishery uses in their management plan reference points from results of the study by Neudecker et al. (2007). In this study the average LPUE (fresh weight per fishing hour) is calculated for every month in the years 2000 until 2006 (Figure 4). The management plan declares that the first reference point (precautionary value) is set at 75% of the average LPUE of the period 2000 until 2006. The second reference point (control value) was set at 50% of the mean. Further it is important that the management system uses two different reference values in one year due to the reproduction cycle of the Brown shrimp. In the first half of the year (w/c 1-24) the precautionary value is set at 25 kg per catching hour and the control value at 17 kg per catching hour. In the second half of the year (w/c 25-52) a precautionary value is set at 40 kg per catching hour and the control value at 27 kg per catching hour.

This LPUE method, which provides the data to calculate the reference point, is in the moment under investigation by researchers. Further the WGCRAN need to approve the method.

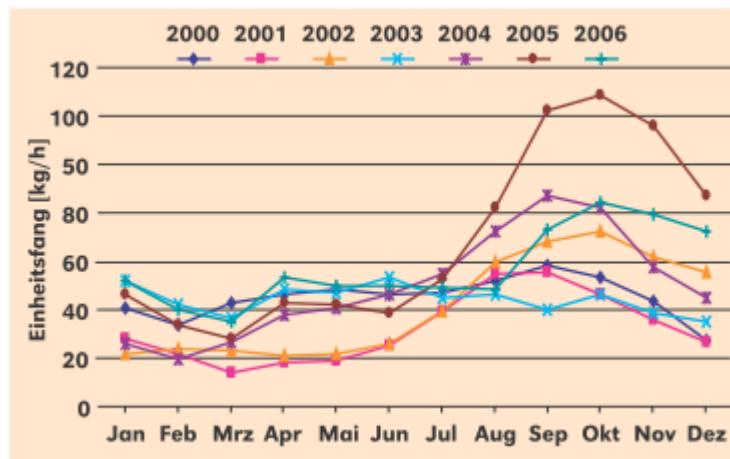


Figure 4 Monthly LPUE (fresh weight per fishing hour) of the German shrimping fleet from 2000 to 2006 (Neudecker et al., 2007).

Harvest Strategy

The harvest strategy is focusing on the plans for adjusting management options in relation to the status of the fish stock. These management actions are needed to achieve defined biological and economic objectives for a fish stock. This includes the regulation of the level of fishing activities and monitoring and ensures that harvest of the target species is carried out on sustainable level. This policy recognises that stocks can be maintained relative to reference points by using instruments of management tools to manage the impact of the fishery. With a proper harvest strategy the fishery

sector is able to act with greater confidence and management decisions are more perceptible (Marine Stewardship Council, 2010).

Additionally the harvest strategy aims to estimate the control rules and actions to ensure that the exploitation rate is reduced as limit reference points are approached. This includes that the harvest control rules consider possibly all uncertainties and the used tools show evidence that an exploitation of the stock can be controlled. The harvest control rule is responsible that the stock level always keeps above limit reference points which in case could mean a reduction in catches and effort. (Marine Stewardship Council, 2010)

Sufficient information about stock structure of the Brown shrimp and its production activity, fleet composition, stock abundance, fishery removals and other information about environmental issues should be present. The stock structure of the Brown Shrimp has been monitored for several years now which helped to earn a rough estimation of the concentration of the stock. Stock productivity of Brown Shrimp is still not fully understood and surveyed.

Fleet composition is recorded and every fishing vessel is licensed. European regulations are made for gear, like mesh size (16mm) and maximum length of the beam trawl (24m maximum). (Aviat et al., 2011).

Sub conclusion

The Brown shrimp stock status in terms of landings and LPUE seems to be in a stable position and indicate that the fishery exploiting the stock at a sustainable level. Due to the high reproduction rate, the short lives span and the strong seasonal variability of the species there is no possibility to use a standard stock assessment with biomass data. The LPUE method, which is now used to calculate the reference points, still needs to be approved from scientist. A harvest strategy aims to control the rules and regulations to reduce the risk of an overexploitation of the stock. These control rules are set to the reference points which are till date under investigation.

3.3 Principle 2 – Impact on the environment

The principle 2 focuses on five criteria: retained species, bycatch species, ETP species, habitats and ecosystem. All of these five criteria take into account the impact of the fishery on the respective ecosystem criteria, the basis, implementation and reliability of measurements to manage the impacts and evaluates the information. (Marine Stewardship Council, 2010). The overall intent of this principle is to minimize the impacts of the fishery on the ecosystem.

Ecosystem

The German Brown shrimp fishery mostly takes place in the Wadden Sea, which is a shallow estuarine area situated along the coasts of Denmark, Germany, and the Netherlands. The benthic habitats are characterized by high abundance of benthic invertebrates. The area provides an important food resource for fishes and birds and is a nursery area for many North Sea fish and crustaceans.

The Brown shrimp is a major prey for cod and whiting and is also an important predator of in- and epi-fauna in intertidal areas. Further it is assumed that Brown shrimp control plaice and mussel recruitment (ICES, 2012). Therefore the species is important for trophic interaction and the ecosystem structure. The LPUE data suggest that the recruitment is not impaired and the effect on the ecosystem structure and function are limited. (ICES, 2012)

Bycatch Species

Bycatch species are fished species that are not retained and therefore get discarded. This includes dead species as well the ones that survive the fishing process (Marine Stewardship Council, 2010).

There is significant bycatch in the German Brown shrimp fishery which is caused by the small mesh sizes of the used nets. Over 50 bycatch species are found which include commercial and non-commercial species (Doeksen, 2006). Bycatch numbers vary a lot between different regions and seasons (Aviat et al., 2011).

In Germany two major bycatch sampling programmes were conducted. From 1954 to 1988 the Federal Research Centre for fisheries carried out a sampling program and another from 1988 to 1992 was conducted in the framework of the Ecosystem Research Wadden Sea. From 1996 to 1998 the EU Project “Research into Crangon fisheries unerring effect” (RESCUE) sampled data from all European Brown shrimp fleets (exception the Netherlands) to study the seasonal bycatch in the shrimp fishery, but focused only on 12 commercial species (including Brown shrimp) (Aviat et al, 2011). In 2006 Germany started the Data Collection Framework (DCF) for the Brown shrimp fishery

to meet EU regulations and in 2011 Germany carried out observer trips which measured the distribution of the catch. (Aviat et al, 2011)

Data analyses by the Thünen Institute (2002-2007) indicated that in the German Brown shrimp fishery the average discard is about 62% of the total catch, of which approximately 20% are non-target species such as juvenile fish and benthos organism. 40% of the bycatch are undersized Brown shrimp which get discarded as well (Bundesforschungsinstitut für Ländliche Räume, 2012). The data from the observer trips (2011) showed that fish species comprised between 3,7% and 23% of the total catch. The species Smelt, Plaice, Goby, Whiting and Flounder were the most common fish species. (ICES, 2012) The spawning stock biomass of the flatfish species plaice, which is one of the major bycatch species in the shrimp fishery, is according to ICES (2011) at a very high level. This may indicate that the discard of the plaice by the shrimp fishery does not hinder the plaice stock. (Aviat et al., 2011)

A study project (CRANNET) about the catchability and selectivity of different mesh types and mesh openings in the codend recently started in Germany and aims also to reduce discard. (Thünen Institute, 2012)

Fishing gear and selective devices

The EU gives regulation on mesh size (from 16 to 32mm and codend 20mm) and minimum market size ($\geq 45\text{mm}$) (Aviat et al., 2011). In 2003 the EU also introduced regulation on using selective devices such as sieving nets and sorting grids, due to the high amount of bycatch in juvenile commercial fishes in the Brown shrimp fishery. (Doeksen, 2006) The enforcement of this legislation was left to the member states, therefore there are different implementation statuses in the different countries for the selective devices now. In Germany the usage of the sieve net is regulated seasonally and therefore in the algae season (during summer) the fishermen are allowed to fish without sieve nets. (Bundesforschungsinstitut für Ländliche Räume, 2012)

Sieve nets have bigger mesh sizes than the codend and are placed inside the trawl (Figure 5) and ensure that larger objects like fish are not caught (e.g. end up in the codend). A study indicated that

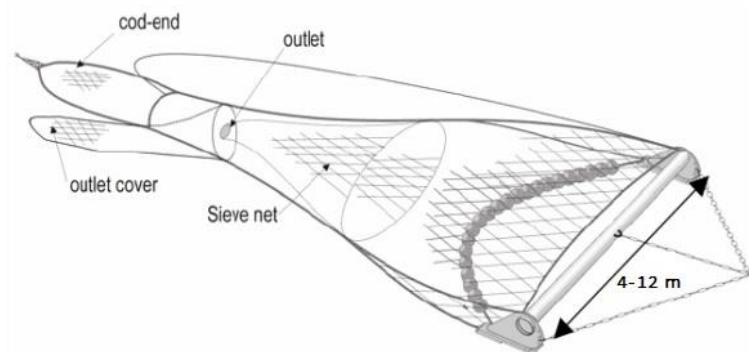


Figure 5 Fishing gear of shrimp beam trawl with sieve net (Doeksen, 2006,modified)

the sieve net reduces bycatch of larger fishes >10cm and invertebrates. Species below 10cm are still ending up in the codend. (Doeksen, 2006)

In the management plan (2013) of the fishery who applied for the MSC have stricter regulation on usage of the sieve net. The overall amount of bycatch and discards decreased in the recent decades through the usage of the sieve nets. (Aviat et al., 2011)

Discard survivability

Bycatch species may suffer fatal or recoverable injuries through catching, sorting and discarding. The injuries are depending on net design, duration of the haul and towing speed. (Doeksen, 2006) The survival rates of the species also depend on the bycatch organism (e.g. age and robustness) and environmental factors (e.g. exposure to air, sun and temperature). The first sieving on board of the Brown shrimp vessel is conducted mostly in a rotating shrimp riddle which operates with high amount of running sea water that increases the survival rate (Neudecker et al., 2007).

Studies indicate that invertebrates like crustaceans mostly survive the fishing method because of their robustness. On the other hand a high percentage of flatfishes, which get caught, do not survive (plaice =80%, sole= 50%). The survival rate of caught round fish is almost zero (Fischer, 2009).

In the current management plan of the fishery in the MSC process the vessels need to drag a buoy behind during sieving to support the survival of the bycatch by bird predation (Management plan, 2013). If this method shows any significant effect on the survival is not researched yet.

Retained species

Retained species are those that have been caught and landed while the fishing vessel has been targeting Brown Shrimp (Marine Stewardship Council, 2010).

Most fishermen in the German Brown shrimp fishery are fishing only on the target species *Crangon crangon* (Aviat et al, 2011; Interview Oberdörffer). However a small number of fishermen are part-time shrimp fishers and if they target other species, different gear is needed. The fisherman is not considered as Brown Shrimp fisher anymore when he changes the gear and targets another species. In that case the catch is not counting for this MSC process. (Interview Oberdörffer)

The German shrimp fishery mostly takes place in the shallow Wadden Sea. Commercial species which get caught as bycatch of the shrimp fishery cannot be landed in this area because they have not the commercial and legal landing size and therefore getting discarded. Also almost all marketable species are sieved out with the sieve net. Fishermen who catch other commercial

species need for the most species a quota to land these species (Doeksen, 2006; Interview Oberdörffer)

Endangered, Threatened or Protected Species (ETP)

The MSC distinguishes species as ETP (endangered, threatened or protected) species as they are recognized by a national legislation or binding international agreements such as Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). (Marine Stewardship Council, 2010)

Germany is party to a number of international agreements, conventions and treaties such as the Ramsar Convention (The Convention on Wetlands of International Importance, especially as Waterfowl Habitat) (Ramsar, 2013) and the Convention on the Conservation of Migratory Species (CMS) (CMS, 2004). The most important directives within the Wadden Sea with respect to ETP species are the EU Habitats (Council Directive 92/43/EEC) and Birds (Council Directive 79/409/EEC) Directives. The Bird Directive aims to protect all species of naturally occurring birds in the territory of the member states. Within the directive member states classify suitable territories for the conservation of these species including migratory species as special protection areas (SPAs). In Germany major parts of the Wadden Sea and a number of offshore areas have been designated as SPAs and this is also the case in the Dutch and Danish part of the Wadden Sea. In this context an ecological network, named NATURA 2000, was established. NATURA 2000 consists of Special Areas of Conservation (SACs) which are selected according to the Flora, Fauna and Habitat Directive and the SPAs of the Bird Directive. (Wadden Sea World Heritage, 2013)

In the fishing area the mammals harbour (common) seal *Phoca vitulina*, the grey seal *Halichoerus grypus* and the harbour porpoise *Phocoena phocoena* are protected. The potential effects on these ETP species are limited to disturbance (vessel noise and presence of human). Several species of birds (18) are also protected and the fishery effect can be the removal of food resource. (Doeksen, 2006)

Information on rare fish species catches is not available due to lack of enough data. Therefore a study by Alfred Wegener Institute for Polar and Marine Research is creating a species inventory for the area. They state that rare species (IUCN Red List) can still be found within the Wadden Sea such as Goldsinny wrasse, River lamprey, Cliff perch, Sea trout, Twaite shad, Salmon and Sea bass. (GAP2, 2013) Most of these species can be avoided in the catch by using the sieve net (Management plan, 2013).

Habitats

The shrimp fishery is conducted almost exclusively with light beam trawls without chains that exert relatively little pressure on the seabed and thereby differ from the beam trawls used in the flatfish fishery. Also the light beam trawl is towed over the sea bed slowly (3 knots). Nevertheless, the iron shoes touch the ground constantly. (Aviat et al, 2011) Depending on the substrate, the structure of the soil community can be changed. The shrimp fishery operates usually over habitats that are sandy and have a strong tidal current. Therefore the impact of the fishery on the bottom is usually low and temporarily. (Bundesforschungsinstitut für Ländliche Räume, 2012) In Germany the Ecosystem Research Program studied the effect of the German Brown shrimp fisheries on the seabed and resulted that the effects are minor (Aviat et al., 2011).

The fishery does not fish in declared mussel banks and restricted areas. The restricted areas account 20% to 40 % of total fishing area. The German shrimp fishery determined in their management plan that they will close areas when there sensitive habitat such as seagrass meadows, mussel banks or Sabellaria reefs occur. (Management Plan, 2013)

A study about the usage of the Pulse beam trawler in the German Brown shrimp fishery is conducted and will be finished in summer 2013. (Thünen Institute, 2013) Also some fishermen try new gear like rolls integrated in the iron shoes. This new method is researched by the TI to define their effectiveness.

Sub conclusion

Principle 2 focuses on the impacts of the fishery on the ecosystem. Studies indicate that the effect on the ecosystem structure and function are limited. Nevertheless there is significant bycatch in the German Brown shrimp fishery which is caused by the small mesh sizes of the nets. The fishing areas where the German Brown shrimp fleet mainly fishes are also important nursing area. Flatfishes and especially round fishes are not surviving the fishing method. The fishery takes measures to reduce the bycatch with sieve nets. The fishing gear, mainly the iron shoes, has impacts on the habitat, but the fishing occurs in areas where natural dynamic changes occur.

3.4 Principle 3 - Fishery management

The Performance Indicators of Principle 3 is dealing with two criteria 'Governance and Policy' and 'Fishery Specific Management System'. Main objective of this Principle is to guarantee a framework for the fishery in which Principle 1 and 2 is included and thus creating a sustainable fishery.

European Union regulations

The fishery management framework should control all process and actions which have an influence on the fishery. Additionally laws and regulations (local, national, international) should be present to make sure that a sustainable Brown shrimp fishery under the principles of MSC can be achieved. The fishery is controlled by the European Union by technical regulations. EU regulations exist in form of limitation of fishing licenses, the beam lengths (24 m maximum), the mesh sizes (16 – 32 mm) and restriction of access to areas which are used by other sectors such as oil platforms, pipelines, shipping routes and wind power. Further the EU established a minimum commercial size for marketing shrimps after landing. (Aviat et al., 2011)

Management plan and enforcement

During the MSC certification process a working group was established in order to create a new management plan for the German Brown Shrimp fishery. This management plan is aiming to ensure a sustainable fishery in future. (Management Plan, 2013) These measures are set in this new management plan for the Brown Shrimp fishery, which was worked out together by the Producer Organisations and is in force since 2011. (Management Plan, 2013) The management plan presents the base for the whole shrimp fishery management who applied for the MSC label. Higher policy decision will be made by a group of people (steering group) from the different POs. This steering group will exchange information and inform the others about their management process within their organisation. The decisions will be made by votes (3/4 majority). Especially issues e.g. the adaptation of the management plan, scientific questions and public relations will be task of the steering group. (Management Plan, 2013)

The four POs comply with the management plan and agree to act within the rules set in this plan. In case of violation against these measures a fine is inflicted. After receiving the MSC certification the label can be deprive (Management plan, 2013)

Management strategies

In the new management system several rules are defined in order to create a sustainable shrimp fishery and to meet the objectives of Principle 1 and 2. The stock will carefully be monitored on

which the fishery will react immediately if the stock is declining. The fishery does not fish in declared mussel banks, and restricted areas which mean that 20% to 40 % of the total fishing area is not used. The German shrimp fishery determined in their management plan that they will close areas when sensitive habitat such as seagrass meadows, mussel banks or Sabellaria reefs occur. (Management Plan, 2013) The total catch days are reduced per vessel to 200 days per year.

A traffic light system is developed to manage the stock on which the fishery can react in form of reducing the fishing effort (Figure 6). If the total catch number lies for about four weeks under the precautionary value but is still above the control value, the fishery is reduced to 72 hours per week per trawler. In case the total catch falls below the control value, the fishery is minimised to 24 hours per week per trawler. The values for the reference points vary between the two half-year (spring-autumn). The calculation of the control and the precautionary values are described in Chapter 3.2 Principle 1 under reference points.

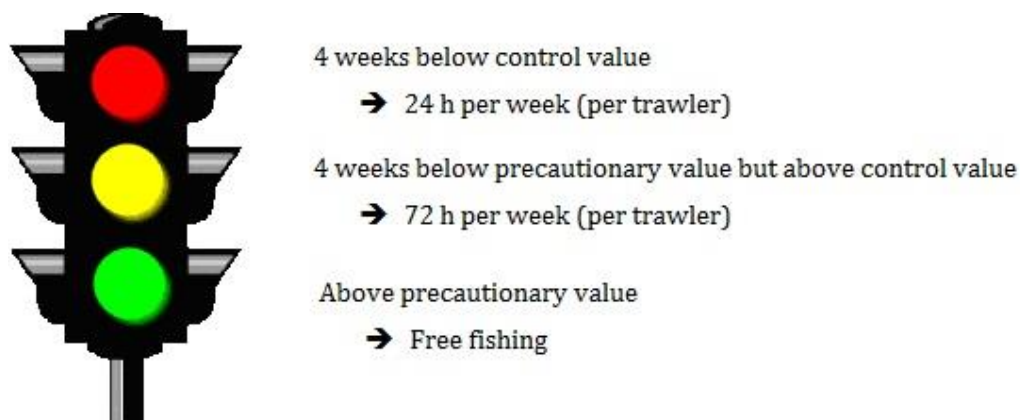


Figure 6 Traffic light system

Ongoing research

Further some trawlers are equipped with iron shoes which have rolls. This test is developed to find out if the roller gear causes less damage on the sea bottom and a decline in the fuel consumption. Additionally effects of the electric beam trawling are made. (Management Plan, 2013) All research is conducted to find the most effective and sustainable fishing method.

A strategic approach and information spreading to all stakeholders and interested parties should be present which is also available for everybody.

Information availability

MSC requires that the fishery should have a platform e.g. a website where information and news are published (Marine Stewardship Council, 2010).

Protocols of the Producer Organisation meetings are made which can be perceived by interested people. The ICES working group CRANGON meets every year to evaluate the status of the Brown shrimp which is published in a report. This report is issued annually and summarizes scientific findings (Management Plan, 2013). The fisheries are monitored at least once a year without announcement. The working group will meet at least four times a year to discuss and exchange information. Additionally the Management Plan can be adjusted if necessary. (Management Plan, 2013)

Sub conclusion

Principle 3 - Fishery management is requesting an effective management system of the fishery which includes that international, national and regional regulation/ laws are strictly followed. The management should follow the standards of Principle 1 and 2 in order to create a sustainable fishery.

This is already happening in the German Brown Shrimp fishery with measures of the used fishing gear. The introduction of the Management plan is an agreement of the fishers with the goal of creating a more sustainable fishery and to fulfil the requirements of principle three. Within the management plan it is recorded that the fishers will support scientific research. Public involvement and a precautionary approach are developed in order to minimize the risk of an exploitation of the stock.

4 Reasons for the delayed process

This chapter deals with the possible reasons for the stagnant MSC certification process of the German Brown shrimp fishery. The results of the analysis are subdivided in the three principles: the stock, the impact on the environment and the fishery management.

4.1 Principle 1 – The stock

The German Brown shrimp fishery had no stock assessment and harvest strategy previous to the MSC application due to the fact that the species is mostly unregulated (no quota). Therefore research for a suitable stock assessment method was not needed (Interview Oberdörffer). The standard stock assessment derives from other fisheries (mostly fish) where biomass calculations are possible. (Interview Neudecker) A standard stock assessment is according to ICES (WGCRAN) not possible for the Brown shrimp due to the high reproduction rate, the high variability in occurrence, different cohort in a year and their short live span (ICES, 2011).

To work out a possible method to assess the stock requires a lot of time for research, data collection and its evaluation. The current state of research states that the shrimp stock along the German, Dutch and Danish coast can be seen as one population. Therefore the whole area needs to be included for an overall stock assessment. The logbook is obligated for each fishing vessel but in every country the quality and collection process differs and is handled differently (ICES, 2012). It takes a lot of time to elaborate a consistent method which can be applied to each country in order to evaluate the data in a uniform way. This is one of the main reasons for the stagnation of the German Brown shrimp fishery MSC certification process.

The German Brown Shrimp fishery implemented in 2011 a management plan which was designed by the Producer Organisations. This plan contains two reference points, a precautionary value and a control value for the stock which is based on the average of monthly LPUE data. This method is still being investigated by researcher and has not yet been approved by the ICES Working Group Crangon.

The fact that new systems and methods needed to be researched and introduced to the shrimp fishery delayed the process a lot and this is still a major factor due to the fact that the LPUE method is still under investigation.

4.2 Principle 2 – Impact on the environment

The main issues caused by the fishery on the ecosystem are the high bycatch and the impact on the habitat. The fishery uses light beam trawls without chains that exert relatively little pressure on the seabed whereby the iron shoes touch the ground constantly. It is towed over the sea bed quite slowly (3 knots). Depending on the substrate, the structure of the soil community can be changed. Research indicated that the fishery mostly takes place in areas where natural dynamics mix up the sea bottom and therefore the impact of the fishery on the sea bottom is insignificant (Aviat et al., 2011).

Further the fishery uses small mesh sizes to catch the target species. These results in a quite amount of bycatch which is discarded right back in the sea and consist mostly of undersized shrimp species and juvenile flatfish. The bycatch depends highly on the season and the fishing area. The main fishing season is performed in the same time when juvenile fish are most present (summer). The fishing is taking place in important nursing areas for flatfishes and round fishes. Especially juvenile organisms are vulnerable to the used fishing process and will mostly not survive (Doeksen, 2006). Study indicated that round fishes show a mortality rate of almost 100% (Fischer, 2009). Invertebrates like crabs have high chances to survive because of their robust exoskeleton. These issues considered by environmental NGOs (Interview Maack (Greenpeace); Interview Liebich (WWF)) are the main obstacles why they see the fishery as unsustainable. For the MSC certification the fishery needs to have measures in place to minimize the amount of bycatch.

The fishery has already introduced measures to solve these problems. Some fishermen try new gear like rolls integrated in the iron shoes and research about better nets and new methods are in place. The Thünen Institute is currently researching which net formation is most suitable to avoid bycatch. Replacing the traditional diamond meshes with square meshes could reduce especially the bycatch numbers of juvenile organisms. Furthermore it is aiming to improve the catch ability of the target species. In addition the management plan implemented rules where the mesh size of sieve net is regulated (20mm). These measures aim to make the fishery more sustainable (Management plan, 2013).

Philipp Oberdörffer (Interview) states that the certifier of the German Brown shrimp fishery does not see MSC Principle 2 as a major problem for the certification. The NGOs in contrast see the environmental aspects (bycatch and disturbance of the seabed) as a huge problem and threat. How far the certifier takes their objections into account at a possible site visit or peer review cannot be investigated because till date the fishery is still in step 3 and no public report is published.

The analysis of the criteria in chapter 3 indicates that principle 2 is not presenting the main problem for the stagnation of the MSC process. The bycatch is an issue of the Brown shrimp fishery but in the new management plan measures (selectivity devices) are set to reduce the unwanted species. NGOs and research show a different view of the impacts on the environment caused. NGOs are mainly concerned about the negative effects on the sea bottom and the unwanted bycatch. Despite to that research indicates that the impact on the sea ground is relatively small.

4.3 Principle 3- Fishery management

The existing POs elaborated a new management plan for the Brown Shrimp fishery which was implemented in 2011. This management plan is an agreement between the German Brown shrimp fishers and describes the overall objectives of the fishery. The Landwirtschaftskammer (LWK) Niedersachsen is in charge to control the adherence of the management plan. Nevertheless the shrimp fishery is still in progress of improving the plan in the fishery and therefore it is likely that the management plan will undergo changes.

Reasons for the stagnation related to principle 3 are that the German Brown shrimp fishery had previous to the MSC certification no common management. The EU regulates technical issues like mesh size and usage of selective devices. With the application for the eco label the POs of the shrimp fishery established a complete new management system with new rules and restrictions. The new measures need time for implementation in the fishery (Interview Oberdörffer). Additionally the learning process has not been finished because the whole management plan of the shrimp fishery needed to be implemented from the scratch. It is much easier to set up a management plan if rules or standards are set by the EU which than can be obeyed like it is the case for other fisheries. (Interview Oberdörffer)

Another important point is the often changing PO and dissensions between the different POs (Aviat et al, 2011). Additionally a lot of small POs existed along the coast and arrangements between the POs were not allowed (Netherlands Competition Authority). This has led to tensions and dissatisfaction within the shrimp fishery and is also a reason why the fishery stagnates in the MSC process. Furthermore new measures had to pass the different entities because there was no independent and all including PO. Decision - making processes in this kind of collocation is very hard and things will be incomplete or cannot even be carried out.

Most POs are registered associations (e.V.) which limits their enforcement of measures. The new PO (Erzeugergemeinschaft der deutschen Krabbenfischerei GmbH) has become a company with limited liability (GmbH). This structure can exert more power on their members which is very helpful for

the enforcement of measures. A common platform where all issues are managed of the whole fishery did not exist. (Interview Oberdörffer)

The analysis shows that the main reasons for the stagnation within principle 3 was the former organisation of the fishery and that a management plan needed to be implemented from scratch.

5 Recommendations to obtain the MSC label

This chapter presents possible recommendations for the German Brown shrimp fishery to obtain the MSC certification. The recommendations are subdivided in the three principles: the stock, the ecosystem and the fishery management.

5.1 Principle 1 – The stock

At the moment the different methods, to assess the stock, are under consideration and investigation by researcher and ICES WGCAN. The LPUE method, which is now used to calculate the stock status and reference points for the German Brown shrimp fishery, has some limitations. Especially because it shows only a retrospective stock status and if in future new fishing methods are introduced, like the electric pulse trawling, the catch efficiency may change.

The LPUE method can be improved by shortening the data collection period from monthly to weekly in order to ensure a more recent view of the stock status. Further another improvement could be an expansion of the data base by increasing the numbers of vessels, which contribute the data. This will also improve the regional coverage of the target species (Interview Neudecker).

The improvements will give the opportunity to act faster on a declining stock and avoid a collapse of the fishery. This can be facilitated by expending the usage of electronic logbooks and support of an overall uniform data storage and quality in all adjacent countries (Interview Oberdörffer). Further the database should be accessible and stored at one institution. All stock data from Germany, the Netherlands and Denmark should be provided to this institution to assess the stock status of the whole area. This institution will send the information of the stock status to every fisherman.

Another method is to conduct surveys over the whole area during summer and autumn (ICES, 2010). This method is still researched and will take time to apply and also requires that at every vessel uses the same procedure for the survey.

It is essential to have a better communication and cooperation between scientist and fishermen. Fishermen are working every day with the fishing gear and have special knowledge and researcher

can study independently the effectiveness of new methods. Cooperation could therefore promote new innovations. Additionally the data collection and quality could be improved when researcher teach fisherman how to gather sufficient data through introducing a standardisation of the fishing process.

The main recommendation is that a uniform data collection is needed to calculate the stock status of the whole area. This can be promoted by introducing one overall institution where all data are stored. Cooperation between scientists and the fishery could improve the data quality and encourage new methods.

5.2 Principle 2 – Impact on the environment

German Shrimp fishing is partly taking place in a National Park and Natura2000 sites where vulnerable species and habitats are protected. The fishing method to catch the target species shrimp is until now rather unselective. Therefore a high amount of bycatch ends up in the net, often with a low chance of survival. Especially in the high season of the fishery the bycatches of juvenile round fishes and flatfishes are high.

The recommendation for this problem is first of all that more research on new fishing gear is needed. Especially research on trawl improvements which make the fishery more efficient in catching the target species without bycatch is needed. The pulse trawl, a device where the heavy ground rope is replaced by electrodes which startle the shrimp to jump up into the net, is currently tested. So far this method showed a reduction of bycatch but also a reduction of the target species in the catch. Additionally the contact to the sea bottom is minimized. This method needs more improvements as a loss of the target species is unlikely to be applied to the fishery because a decrease of the amount of the target species will bring a loss in income for the fisherman.

Improvement to increase the chances of survival of bycatch would be a discard chutes to release the organisms below the surface which will reduce seabird predation on the discarded species. (Quirijns et al., 2008)

The constant contact to the sea bottom by the iron shoes of the beam trawl is another environmental aspect. The substrate and the structure can be changed which can have effect on the organisms. Therefore a monitoring program should be carried out to get a clear picture of the effect on the seabed and measures to reduce it. Research on vulnerable habitat such as mussel banks, seaweed meadows and Sabellaria reefs should be studied to map these areas in order to close them for fishing. In that way pristine environments can be protected.

To gain more insight on the impact on Endangered Threatened Protected (ETP) species a better monitoring program should be established. A list of endangered species can be introduced to the fishermen to document and report these unwanted catches. (Dutch management plan, 2011) It could be obligated to note the ETP species in the electronic logbook to gain more information which ETP species occur in the area. With this information measures can be taken to reduce the number of ETP species in the bycatch.

The Brown Shrimp fishery reduces the bycatch by using sieve nets where larger organisms can escape out of the net. Measures to reduce especially smaller species (juvenile fishes) should be more researched because they are the most vulnerable to the fishing method.

The bycatch distribution changes throughout the year therefore the usage of different fishing gear is recommended. An adaptive fishing method could be a solution for the fishery to promote the selectivity of the fishery. This will mean that throughout the year the fishery adapts to the different natural condition with respective fishing gear.

NGOs (WWF and Greenpeace) also would like to have closed areas in the Wadden Sea as fishing is taking place in Nature Parks, Natura2000 and World Heritage Sites. Therefore it is desired by the NGOs that the fishing areas has closed areas (seasonally or spatially). This is not mandatory for receiving the MSC certification and restricted zones will also mean the closure of the most important fishing grounds. A compromise could be to reduce the fishing effort in these areas when the distribution of juvenile species is the highest. The main recommendation is to research new method to reduce the unwanted bycatch and protection of vulnerable habitats.

5.3 Principle 3 –Fishery management

The management of the Brown shrimp fishery is written down in a management plan “Managementplan der deutschen Nordseegarnelenfischerei” which is in force since 2011. It arose in coordination with the POs and the Landwirtschaftskammer Niedersachsen who advised the POs. The management plan contains different topics like the catching area in the North Sea, the fleet, fishing gear and technical regulations, the target species, impacts on the environment and the current management and its structure. The implementation of the management plan was a big step towards meeting the MSC criteria. The fishery declares in several ways (e.g. using bigger mesh size, restriction zones for fishing, and a harvest strategy) to act more sustainable. (Management plan, 2013)

An important point is that the fishermen are still divided in different POs. A recommendation would be that one overall PO includes all fishermen and that this PO is registered as a company with

limited liability (GmbH) in order to receive more power to enforce regulations and rules. One overall PO would minimize disagreements between fishermen and also provide a contact person for belongings of the whole fishery.

MSC states that each management measure that the fishery follows, will contribute into the MSC assessment even it is a voluntarily “Code of Conduct” as long as it does not counteract with national and international laws. This indicates that a management plan does not need to be directly from the EU or national institution. The management plan needs to be obligatory to the fishery and penalties need to exist. (Interview Schröder) The management plan of the German Brown Shrimp fishery has penalties which can be given to the fisherman who break the set rules.

Nevertheless the management plan is an agreement between the fishers. This agreement is not as binding as regulations set by the EU or Germany and could therefore lead to a weaker execution of the rules. Even though penalties in form of fines and the execution of the PO are present, it is debateable if the management plan works out as desired with no governmental enforcement. This could be improved if some regulation of the management plan are approved by the government and therefore have a general validity for all fishers along the coast. Especially regulations on restricted areas such as Sabellaria reefs and stock regulations should have general validity. This is necessary because without the general validity other fisheries (not MSC certificated fisheries) can still fish in these areas and make the regulation ineffective.

Another recommendation could be to introduce a TAC and quota scheme. This could help to stabilise market and landings and enforcement of regulations. Before considering this idea the socio and economic consequences need to be researched.

The analysis also showed that there is a lack of communication between fishers, NGOs and other institutions who are involved in the MSC process. Information of recent changes in the sector does not reach out to interested parties. Therefore communication should be improved because it is the base for a good collaboration and exchange between the stakeholders. In the MSC process of the Brown shrimp fishery a lot of different parties are involved from many sectors, which do not pursue partly the same goals. Here it is recommended to create a platform for dialogs between the stakeholders especially between environmental NGOs and fishermen (Interview Schröder). NGOs and fishery both want a sustainable fishery. The fishermen want to keep the fishing in future and the NGOs want to preserve the area for long term. Sharing ideas and taking into account the opinions of different parties will help to get a better understanding of the overall situation. Especially the on-going process of certification involvement of the stakeholder will increase. To improve the communication between the fishery and other stakeholders a platform for exchanging

information and improvements like meetings or a newsletter could help. An external person could work as a mediator to improve the tense situation. This cooperation will be helpful to promote the MSC process.

Another point, which can be recommended, is a better involvement of research in the fishery. Research has barely taken place in the last years (Interview Oberdörffer) and this is one of the reasons why little data and knowledge is available. With the MSC certification process the set requirements to pass the assessment demands a lot of information and research about the stock of target species and the fisheries impact on the environment. In order to provide this data independent scientific expertise is necessary. Therefore the fishery must be able to show evidence with scientific reports to the certifiers that their management method is reliable and sustainably carried out in order to preserve the stock. (Interview Neudecker)

The main recommendations are to incorporate the existing POs in an overall PO, which is registered as a GmbH. A better communication between the stakeholders would increase the understanding of the other needs. Additionally more involvement of research in the fishery is recommended.

6 Conclusion

The German Shrimp fishery presents an important economic sector and has a long history in Germany. This study has revealed several aspects which have shown why the German Brown Shrimp fishery is still unsuccessful in receiving the MSC label. The fishery is seen to be compatible with the principles set by MSC, once several improvements have been implemented.

Therefore to give an answer to the main research question *“Which recommendations can be given for the German Brown shrimp fishery in order to obtain the MSC certification?”* an analysis of the current situation of the German Brown Shrimp fishery in the MSC process was carried out in order to provide possible recommendations of how to obtain the MSC certification.

The standard stock assessment cannot be applied to Brown Shrimp, as a biomass calculation is not possible for this short living specie. Also important is the impact on the seabed and their organisms, especially the bycatch, which is caused by the beam trawls. The relatively new implemented management plan was created from the scratch because there are besides technical measures no common management set by the EU.

It has been investigated that there is a lot of research done to elaborate a stock assessment method which can be applied to Brown Shrimp. So far the LPUE method can roughly estimate the stock status of the target specie which could be applied to Brown Shrimp. Improvements should be taken by shortening the period of data collection and a uniform data collection/ system is recommended for all countries (esp. Germany, Denmark and the Netherlands).

The main concern of NGOs are the environmental impacts that are caused by the beam trawls of the shrimp fishery. Bycatch is hereby a significant point which occurs by using small mesh sizes. Also permanent sea bottom contact of the ground rope is causing disturbances. It is recommended to carry out more research to gain better knowledge about the effects on the marine ecosystem and to reduce bycatch with new fishing methods. Nevertheless principle 2 does not present the main problem of the stagnation of the process.

The stabilisation of the organisation within the shrimp fishery has considerably improved. In 2011 the existing Producer Organisations have developed a management plan *“Managementplan der deutschen Nordseegarnelenfischerei”* in which measures are taken to meet the standards of MSC. The performance of this plan is the responsibility of each fisherman and may contribute significantly to the progress of the MSC certification. It is recommended to establish one overall PO where all fishermen are included to prevent dissension between the different POs. Additionally

more communication between the stakeholders is needed to define a common direction for the future.

It is still feasible for the German Brown Shrimp fishery to obtain the MSC certification if especially improvements of the organisation and stock assessment will be made.

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Appendix I Interview Outline for the Interviewee

1. Introduction
 - Accordance to record
 - Introduction to the topic
 - Guidance through the interview
 - Handout
2. Personal information
 - Name:
 - Function:
 - Organisation or Institute:
3. Relation to the German Brown Shrimp fishery and relevance to the MSC process
 - Connection to the Brown Shrimp fishery?
 - Connection to the MSC process of the Brown Shrimp fishery?
 - Relevance that Brown Shrimp fishery receives the MSC certification?
4. Explanations for delayed MSC process
 - Main reason for the stagnant MSC process?
 - Problems of MSC Principle One: The stock
 - Problems of MSC Principle Two: Impact on the environment
 - Problems of MSC Principle Three: Fishery management
5. Recommendations to obtain the MSC certification
 - Recommendations to fulfil the MSC Principles?
 - MSC Principle One: The stock
 - MSC Principle Two: Impact on the environment
 - MSC Principle Three: Fishery management
6. Ending

Appendix II Interviews

In this study five interviews with stakeholders were conducted. The stakeholders are chosen because they represent the main stakeholders in the MSC process. The interviewed stakeholders are representatives of the Brown shrimp fishery, NGOs, Research and MSC. An interview with the certifier was not possible.

The interviews are conducted in German, then a transcript is made and afterwards it is summarized in English. The summaries are divided in four parts: 'Personal information', 'Relation to the German Brown Shrimp fishery MSC process', 'Explanations for delayed MSC process' and 'Recommendations to obtain the MSC certification'. The information in the parts Explanations for delayed MSC process and Recommendations to obtain the MSC certification were subdivided in 'Principle 1 – the stock', 'Principle 2 – the ecosystem' and 'Principle 3 – fishery management'. The colour-marked parts helped to analyze the interviews.

Appendix I Thilo Maack (Greenpeace) – 27 may 2013 – personal interview

Marine Biologist, Program Officer for Protection of the Seas

Appendix II Viola Liebich (World Wildlife Foundation) – 23 may 2013 – personal interview

Program Officer Wadden Sea and Fisheries

Appendix III Vivien Schröder (Marine Stewardship Council) – 31 may 2013 – phone interview

Stakeholder and Fisheries Outreach Officer

Appendix IV Dr. Thomas Neudecker (Thünen Institute) – 28 may 2013 – email interview

Scientific Officer at the Institute of Sea Fisheries, Hamburg

Appendix V Philipp Oberdörffer (Landwirtschaftskammer Niedersachsen) - 21 may 2013 – personal interview

Representative Fisheries, Coordinator of the MSC process for the German Brown Shrimp fishery

Appendix III Summary of the interview with Thilo Maack (Greenpeace)

Personal Information

Thilo Maack is oceans campaigner at Greenpeace. His main focus is protection of the seas, overfishing, protected areas and international whaling.

Relation to the German Brown Shrimp fishery MSC process

Greenpeace is publishing a fish-purchase guide for consumer to provide recommendations which fish was caught sustainably and is not overexploited. There are three points which are very important to Greenpeace. First, how is the stock status of the target species, which fishing method is used and for the case that the stock is threaten, is a reconstruction plan available. And one of the main criteria, and that concerns the shrimp fishing very much, is that it is an invasive destructive fishing method. That can be applied to the shrimp fishery because it is touching the ground and creates high amount of bycatches.

Greenpeace is not involved in the MSC process as stakeholder because Greenpeace thinks that the German shrimp fishery is not MSC certifiable until now because of two reasons: the bycatches and the unknown population dynamics. That's why Greenpeace has said from the beginning, that they do not need to be stakeholders, because Greenpeace has a very clear opinion about the German Shrimp fishery. In case that the MSC should assess the shrimp fishery positive, it would be another MSC certified fishery, with which Greenpeace cannot agree. There are many MSC-certified fisheries where certified fishery received the MSC label justifiably but there are also examples where Greenpeace does not agree. Another point of criticism is that only with the plan to implement more sustainable measures to the fishery, the fishery can get certificated. Therefore Greenpeace thinks that it is a process-orientated certification, which they see critically.

Explanations for delayed MSC process

Thilo Maacks states that there are two main critical points. One is that the population dynamics of the Brown Shrimp is relatively little known and that the target species it is non quota species but especially the fishing method is criticized. The fishing method is not as invasive as other flat fish fisheries but still it is causing a lot of bycatch.

The fisheries management is self-regulating as it is adapting to the price market.

Recommendations to obtain the MSC certification

First a lot more research in terms of stock assessment of the target species is needed and better knowledge about the environmental impact of the shrimp fishery. Also more research about another fishing method is necessary. Additionally Thilo Maack is requesting a big area where no fishing is taking place because there are no larger protected zones in the Wadden Sea.

Appendix IV Summary of the interview with Viola Liebich (WWF)

Personal Information

Viola Liebich is program Officer Wadden Sea and Fisheries at the nature organisation WWF. Since 2012 she is coordinating a project of WWF which is dealing with the shrimp fishery and the protection of the Wadden Sea.

Relation to the German Brown Shrimp fishery MSC process

WWF is a registered stakeholder of the MSC certification process of the German Brown Shrimp fishery, which means WWF is able to wield influence according to the rules (e.g. site visit, public common draft report). WWF is the cofounder of MSC but MSC has become an independent organisation. Therefore WWF is just a stakeholder as others.

Important for WWF to note is that the shrimp fishery is taking place in the Wadden Sea and in a National Park. A National Park is the highest distinction of protection for coherent areas in Germany. Therefore nature protection has to play a very important role. The problem hereby is that MSC does not consider the concept of protected areas in their principles. In the principles it is not stated that protected zones need stronger guidelines than other areas. Therefore it is important that nature organisations put their focus on these aspects.

The shrimp fishery as it is carried out currently is not sustainable enough. For WWF the shrimp fishery should only be certified when the fishery improves their method to become more environmental friendly. Therefore a dialog between nature organisations and other stakeholders is important to evaluate sustainable possibilities. This should include areas where no fishing is allowed, as it is a National Park. In general WWF is not against a MSC certification of the Brown shrimp fishery but several requirements need to be fulfilled first.

Explanations for delayed MSC process

It is often projected that the main problem for the delay of the process is the missing stock number because the population is distributed over the whole area and the right methods are missing to calculate the stock.

Principle 2, the impact on the environment is in WWF's opinion also a main issue even though it is sometimes seen as a less important point. The shrimp fishery is causing two main problems: first the fishery has a lot of bycatch and secondly the marine environmental threat caused by the beam trawls.

For principle 3 - fishery management it is important to take into account that fishing is taking place in a National Park. A fishery management also means that a good organisation of the shrimp fishermen should be present. Before the new large Producer organisation recently got introduced, it was difficult to communicate. This is important because there should be a contact person and bundle interests is also central. This was a problem before but with the newly founded Producer Organisation improvements have taken place.

Recommendations to obtain the MSC certification

For the stock assessment more reliable numbers are needed which is already planned. Also it could be possible to use the Risk- Based Approach but this need to be investigated if this could be a possible opportunity.

It is suggested to invest more into research like mesh size, sieving nets and therefore create a reduction of the bycatch and a higher survival rate. Additionally research on fishing gear to minimise the contact to the sea bottom should be conducted.

But principle 2 is at least as same important as principle 1, to reduce the impact on the ecosystem. Again it is important to reduce bycatch and the contact to the sea ground which can be done with research.

For the fishery management it is requested to create restricted fishing zones. If the measures are applied, the fishery has a good chance to be a sustainable fishery. The MSC can be a chance to make the fishery sustainable and preserve the fishery in the region which also is an important economic aspect for the region.

Summary of the interview with Vivien Schröder (MSC)

Personal Information

Vivien Schröder is the Stakeholder and Fisheries Outreach Officer for MSC Germany. She is doing public relations work with MSC stakeholders from eNGOs, politics and fishery administrations and represents the MSC in the German and Danish fishery industry

Relation to the German Brown Shrimp fishery MSC process

The role of MSC in fishery assessments is basically the role of a normal stakeholder. The MSC is completely independent and is not actively related to the assessment process as the assessment is done by an independent certifier (Conformity Assessment Body, CAB) who evaluates the fishery based on the MSC certification requirements. Every fishery may enter the MSC assessment process as long as it does not employ illegal fishing gear. With the publication of the Public Common Draft Report (PCDR) on the MSC website a fishery assessment enters the public stage and stakeholder involvement is possible. The PCDR is written on the basis of information which was collected during the site visit.

Explanations for delayed MSC process

As described above the MSC is not actively involved in assessing a fishery and as long as the PCDR has not been published the MSC has no official back ground information on the progress of an assessment. Up until today the CAB has nominated the expert team and announced the use of the standard assessment tree. The standard assessment tree is made up out of 31 Performance Indicators, which among others ask for a harvest control rule (HCR), reference points (RPs) and target stock monitoring, all of which have to be scientifically proven to work. The management of the brown shrimp stock in the Wadden Sea is not based on scientifically accepted HCR, RPs or monitoring. The fishery is working together with scientists, for example the ICES CRANGON working group, to establish a scientific base for the management system.

Recommendations to obtain the MSC certification

Vivien Schröder is welcoming the fishery's engagement in research projects aiming to increase gear selectivity. Generally Vivien Schröder recommends that the dialogue between eNGOs, governmental environmental protection and the fishery is very important. The conflict between the shrimp fishery

and nature conservation is centuries old and the MSC process may give fresh impulses into the discussion and provide a new platform for dialogue.

Summary of the interview with Dr. Thomas Neudecker (TI)

Personal Information

Dr. Thomas Neudecker is a researcher at the Thünen Institute (TI) at the department Sea Fisheries. He works on various projects related to the shrimp fishery such as the ongoing CRANNET project. He developed a management proposal based on LPUE data for the shrimp fishery and is one of the initiator of ICES WGCRAN and the former chairman of the group.

Relation to the German Brown Shrimp fishery MSC process

Neutral scientists and observers of the MSC process, based on his studies a management plan of the shrimp fishery were introduced.

Explanations for delayed MSC process

As part of the certification process standards are given, which are derived from other fisheries, where stock assessments are possible and are performed that stock changes can be detected. On the knowledge resulting from the stock assessment, management measures can be based. A stock assessment is currently not possible for the short-lived shrimp, so that the standard method, as applied to fish, cannot be apply here (P 1). For the Brown shrimp alternatives need to be evaluated and these need to be accepted by the certifier.

The history has shown that even at extremely low shrimp stocks (1989-1990) a recovery within one year is possible, so that a biological overfishing was not the case as it was an economic overfishing at that time. In that time shrimp had also reproductive problems through unknown causes and experienced high predation by whiting. These natural conditions have to be accepted by the certifiers, because otherwise a certification despite best biological conditions is not possible.

Recommendations to obtain the MSC certification

One possible way to assess the stock would be to use the proposed short-term LPUE data (monthly and weekly) and the experimental application of reference points. These reference points can help to protect the stock by for example reducing sea hours (P3). The reference values can be determined empirically by using long-term data from the fishery and set by "good faith" in order to counteract overfishing.

The fishery can develop their management system by shortening the time periods (e.g. from weekly to monthly) and an expansion of the data base (increase the number of vessels for the data collection, inclusion of sufficient vessels which fish per day as well as multi-days and adequate regional coverage). This is facilitated by the new use of electronic logbooks.

The fishery must prove with independent and scientific expert opinion to the certifiers that their management practices are efficient and trustworthy enough to reduce the risk of overfishing of the stocks.

A scientific stock assessment (P1) with the current surveys and procedures is barely or if at all retrospective possible, making it for a management system (P3) and for the MSC process unusable.

Appendix V Summary of the interview with Philipp Oberdörffer (LWK)

Personal Information

Philipp Oberdörffer is working at the Landwirtschaftskammer (Chamber of Agriculture) Niedersachsen. Since 2003 he is a consultant and responsible for fisheries at the Chamber for Sport and Coastal Fishing. The chamber has contracts with the individual institutions.

Relation to the German Brown Shrimp fishery MSC process

The Chamber of Agriculture coordinates the MSC application of the German Brown shrimp fishery. Philipp Oberdörffer is the coordinator of MSC process for the German Brown Shrimp fishery. The independent inspector who is controlling the fishery is from the control service of the Landwirtschaftskammer. He measures the mesh size and other regulation from the management plan.

Explanations for delayed MSC process

The PO "Landesvereinigung für Nordseekrabben und Küstenfischer e.V." had conveyed the MSC process. This PO is now dissolved and also the PO in Büsum. The new PO „Erzeugergemeinschaft der Deutschen Krabbenfischerei GmbH“ will take over mostly and the „Erzeugergemeinschaft der Küstenfischer Tönning, Eider, Elbe und Weser w.V.“, „Erzeugergemeinschaft Elsfleth e.G.“ and „Erzeugergemeinschaft Nord- und Ostsee GmbH“ are still involved. The Producer Organisations in Germany were always independent which is a problem of the process. That is really like Brussels, Berlin, Hannover, the stuff gets lost on the way and there are also difficulties to enforce specific rules on all instances. This is the same problem for the MSC process, because there is no association or no official connection no institution which covers the sector.

The existing POs were used as operational units because they have access to their members. The management plan is enforced since 2011. The steering group has no form as an association. They are nowhere registered and they work on voluntary basis under the provisions of the management plan and then try to coordinate these rules. In the end the PO need to enforce the regulations on their members. The involved POs have with their members next to membership also a specially signed contract where the issue MSC is considered. The future will show, whether a membership in a PO is sufficient in the end because most POs still have an association (e.V.) form and the

association law is very vague and does not involve economical issues. The new big PO has the form of a limited liability company (GmbH) where members are shareholders. This is a better solution.

The fishery is actually always under attack and that is also a kind of prejudice. Due to the fact that the fishery takes mostly place in the National Park it is under special observation by NGOs. The MSC application is another attempt to prove that the fishery acts sustainable in the area.

Another problem of the stagnation is the deficits of the stock assessment. There was for decades no research on shrimp. The last big research project was the ecosystem research in the mid 90's. Therefore the problem is to get data which is needed now. Also the interest on the subject is low by public institutions because it is a non-quota species. Even the ICES Working Group WGCAN says the standard stock assessment on Crangon is impossible. Globally already other fishery are certified and do not use the standard stock assessment but other methods.

The Brown shrimp need be seen as a one year species and this makes the whole stock assessment difficult, because you need to collect data always for an incredible short period to have a realistic stock assessment. Even with the stock assessment in place natural predator could occur and therefore fast changes can take place and it is right now not possible to assess the stock that fast. With the electronic logbook it is much easier and faster to get the LPUE data. The certifier desires that the ICES Working Group approve the LPUE method, because it is the highest scientific authority for Crangon.

Until now the sub-samples arrive weekly from 30 vessels in Germany to get the catch amount and fishing hour. All together 70 subsamples are collected (including Denmark and Netherland), this number is quite hard to collect by a research vessel. In a four week rhythm the data are matched with Netherlands and Denmark. Another problem is that it makes no sense to use different system on one stock. Cooperation with the other countries is needed. The fishery occurs over the whole area and therefore the samples are taken from the whole area.

Most shrimp fishermen (99%) are only allowed to catch shrimp. And if they use the sieve net there is no marketable catch in the net.

Research confirms that the shrimp fishery is not destructive. The fact that many shrimp businesses are existing already over five or six generations shows a grade of sustainability.

The other point is the management of the fishery. This is also a problem at the moment. The new large PO got recently introduced and therefore the old system with the small PO is gone and the fishermen need to find their way in the new system first. Another point which played an important role is that the management plan needed to be written from the scratch. The fisheries on fish have

already a lot of requirements set by the EU. Therefore it is easier to implement few more regulations the MSC. For the shrimp fishery a whole new management plan is needed. The regulations are coming from themselves which makes it hard for the fishermen too. Further a PO does not have police force to punish their members like the state

Recommendations to obtain the MSC certification

The LPUE system will probably be adjusted in the coming years, because the data collection continues and also improvements will be made and this will improve the predictions too. This needs to be coordinated with the other countries. When the electronic logbook works better no more sub-samples are needed and the entire fleet can be taking into account. Another point is that the vessels can report every 24 hours, and then perhaps is it possible to get a "real-time" stock assessment. The fishing and sieving process need to be standardized by all fishermen.

There are many opportunities to improve the fishing gear. Until now research at the codend and the irons shoes are made. There are still a lot of things where no research is done. Fishery improvements came mainly from Holland where fishermen themselves have played a role. But the improvements need validation therefore the science should test the effectiveness of the improvements. And since the brown shrimp can be seen as a one-year-organism different gear over the year can be used.

With one or two POs and another type of cooperation as before the management points can be fulfilled as other examples of PO shows. The difference is that here a complete own management needed to be implemented. Therefore the main recommendation for the management part is a good organisation with a tight management. With the new PO, which captured a large part of the German fishermen, the management of the fishery got on the right track.

NGOs identify Principle 2 as a major problem but the certifier does not see that as a big problem. They are certainly not "best practice" and there are many things to improve.

Appendix VI Overview 31 Performance Indicators

