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The Role of MSC Marine Certification in Fisheries Governance in Finland

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Abstract: Finnish fisheries are regulated first and foremost by the EU Common Fisheries Policy (CFP) and quotas determined by the EU. Certain fisheries have also been certified according to the international Marine Stewardship Council (MSC) standard. The aim of this article is to study the added value that the MSC brings to the governance of the ecological sustainability of Finnish marine fisheries. This is achieved by scrutinizing how the MSC addresses the ecosystem approach and how different experts and stakeholders see the role of the MSC in contributing to sustainable fisheries. We endeavor to unravel the sustainability benefits that non-state regulations can offer for a fishery in the Baltic Sea that is heavily regulated and controlled by the EU. We found that the MSC has led to some minor positive changes in fishing and that the indirect support the MSC provides when following scientific advice is even more important.

Keywords: sustainable fishing; Marine Stewardship Council; ecosystem approach; fishing quotas; bycatch; ICES; European Union; herring; Baltic Sea



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1. Introduction

The understanding of the importance of sea ecosystems has increased over recent decades—lagging slightly behind the protection of terrestrial ecosystems. Now, there are both global and regional efforts to improve the state of sea ecosystems. In the European Union (EU), the Marine Strategy Framework Directive (MSFD), the Water Framework Directive (WFD), and the EU Biodiversity Strategy [1] aim to improve the environmental status of marine ecosystems. Sustainable fish stocks and fisheries are part of this aim, and fisheries are more closely regulated by the EU Common Fisheries Policy (CFP). Additionally, HELCOM is working consistently to improve the state of the Baltic Sea [2].

Seafood stocks within biologically sustainable levels have declined by 21% over the past c. 40 years, while 31% are being overfished [3]. However, there has been some improvement in fishing rates and some restoration of overfished stocks and marine ecosystems through effective management actions taken in certain areas, including the Baltic Sea, which faces many challenges such as eutrophication, marine pollution, and climate change effects [2,4].

An insufficient amount of governmental and intergovernmental policies have called for supplementary measures. Non-state regulation has been necessary in the context of a lack of government intervention to limit the unintended consequences of fishing, such as overfishing and bycatch [3,5]. Market-based strategies, for example, ecolabeling, are aimed at creating awareness and educating consumers on the environmental and social effects of their daily purchases, all the while advocating for a change towards a more sustainable industry and directing consumer purchasing behavior [6].

Perhaps the most well-known non-state regulation attempt to solve the issues of the sea commons is the certification scheme of the Marine Stewardship Council (MSC), an organization whose standardized, scientifically-supported blue label claims to verify that

a seafood product has sustainable origins. In 2020, the MSC coverage of global seafood capture accounted for 14%. Based on seafood volume, the MSC is one of the leading environmental standards [3]. The label aims to provide information about practices of production, processing, and trading to traders, retailers, and consumers [5]. Currently, adopters of this standard mostly represent large North American and Northwestern European stakeholders [5,6], but the share of other stakeholders is slowly increasing.

The aim of this article is to evaluate the added value that the MSC brings to the governance of the ecological sustainability of Finnish marine fisheries. This is achieved by scrutinizing how the MSC addresses the ecosystem approach and how different experts and stakeholders view the contribution of the MSC to sustainable fisheries. We endeavor to unravel the sustainability benefits that this non-state regulation can provide to a fishery in the Baltic Sea that is heavily regulated by the EU. Our focus is on fishing, which is regulated by the MSC Fisheries Standards. The selling of fish is regulated by the MSC Chain of Custody Standard, which is not in the scope of this article.

Our assumption was that Finnish fisheries are tightly regulated in the Baltic Sea by the EU and the government of Finland. Could the MSC offer increased ecological benefits alongside possible market premiums and access to the market? Currently, there are no significant direct ecological benefits, but improved surveillance may bring ecological benefits in the long run for bycatch and endangered species. In addition, the MSC certification strengthens states' willingness to follow and support the scientific advice on sustainable annual catch, as defined by the EU's total allowable catch (TAC) limits for fish species.

2. Materials and Methods

This article is based on semi-structured expert (6) and stakeholder (7) interviews (for the list of interviewees, see Appendix A) and on scientific and grey literature. Interviews were conducted online, and videos were recorded and transcribed. All interviews were approximately one hour long. Transcribed interviews were analyzed according to our research questions, with particular attention paid to the benefits the interviewees saw in the MSC, how the interviewees described the credibility of the MSC, how the MSC supports the ecological sustainability of Finnish fisheries, and how the total allowable catch is defined. If a statement was only supported by either stakeholder interviewees or expert interviewees, the interview(s) is referred to as Stakeholder Interview 2021 or Expert Interview 2021.

The six interviewed experts worked at either universities or research institutes. The seven interviewed stakeholders represented an environmental NGO, two trade unions, MSC Europe, MSC Finland, and a restaurant chain. Some of the researchers were also stakeholders, since they took part in defining the total allowable catch. There were three interview requests (one expert, one stakeholder, one certifying company) for which we did not receive a response.

Previous studies on the MSC and other fishery-specific certification schemes have shown, for instance, that the MSC supports an ecosystem approach [7], that evaluators do not interpret the MSC criteria in a consistent way [8], and that the MSC brings improvements in only certain aspects of ecosystem-based sustainability [9,10]. The MSC can reduce over-fishing but cannot totally prevent the certification of over-fished stocks [11].

3. Background

3.1. Ecosystem Approach

The global regulation of fishing started with the UN global convention of the sea, UNCLOS (1982), followed by the UN Fish Stocks Agreement (1995) and the FAO Code of Conduct for Responsible Fisheries (1995). Gradually, the ideal of fisheries management has moved from single-species management to multi-species management, and toward ecosystem-oriented approaches that include, e.g., reducing bycatch and habitat impacts, taking the entire food web into account, and making sure there are adequate nursery areas [4].

Now, it is widely acknowledged that sustainable fishing requires consideration of the ecosystem approach, which means that the functional complexity of the ecosystem should be fully acknowledged, not just the health of a targeted fish stock. In addition, marine ecosystem management must be coordinated across countries that exploit and affect the ecosystem in question, instead of only looking at the fish stock or the ecosystem within national or regional boundaries.

Nevertheless, fisheries management is still struggling to transition from single-species management to multi-species management and even ecosystem-based management (EBM) [12]. The ecosystem approach (EA) to management, or ecosystem-based management, of marine environments and resources is nowadays the main framework for approaching the sustainable management of marine resources. Although EBM and the EA are vague concepts, a wide range of policies and regulatory instruments have been introduced in the management of fisheries and marine environments using these ideas [13]. The terms are sometimes used interchangeably [14] and sometimes refer to different things [15]. A third term, ecosystem-based approach (EBA), is also used in EU environmental law, for example in the Marine Strategy Framework Directive (MSFD).

Ballesteros et al. [16] state that there is a conceptual distinction between EBM and the EA, but currently the terms are generalized in their use. Therefore, in this article, the terms are used interchangeably.

There is no single agreed-upon definition or implementation method for these concepts. In general, ecosystem management emphasizes “the need to manage human activities that have an effect on the marine environment and its ecosystems in an integrated, cross-sectoral manner in order to promote the sustainable development of oceans and seas and their resources” [17].

The Convention on Biological Diversity [18] defined the EA as: “a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Application of the ecosystem approach will help to reach a balance of the three objectives of the Convention. It is based on the application of appropriate scientific methodologies focused on levels of biological organization which encompass the processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of ecosystems.”

Within the FAO (the UN Food and Agriculture Organization), the EA has been defined in relation to fisheries as follows: “An ecosystem approach to fisheries strives to balance diverse societal objectives, by taking into account the knowledge and uncertainties about biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries” [19].

In practice, an ecosystem-based approach in fisheries means a step away from single-species management towards multi-species management, whereby, for example, defining total allowable catch includes taking prey–predator and other biological relationships into account. Other targets include bycatch mitigation, or avoiding incidental uptake, and protecting vulnerable ecosystems [12]. Other pressures on the marine environment, such as the eutrophication of the Baltic Sea, climate change, and the lack of marine protection areas [20,21] are not primarily in the hands of fisheries but require national and EU-level decision making and a holistic, ecosystem-based approach in marine policy, integrating the management of land, water, and other resources.

For the analysis presented in this article, a holistic view of ecosystems, not just of fish, was an important component, as well as the prioritization of scientific knowledge as the basis for decision making.

3.2. ICES and Ecosystem Approach

Scientific assessment underlies most claims of sustainable fisheries. The ICES is an intergovernmental marine science organization. Over 2500 scientists, 20 member states, and over 700 marine institutes take part in the work of ICES annually. Among many

other scientific tasks, ICES conducts fish stock assessments and provides scientific advice regarding TAC on request to, e.g., the European Commission. In addition to TAC advice, ICES carries out mapping of vulnerable marine ecosystems (Expert Interview 2021).

ICES began developing the ecosystem approach in 1992, following the Rio Earth Summit, but its implementation has not been easy, and the EA was not fully embedded into the EU policy framework until the approval of the MSFD and the CFP reform in 2013 [16]. ICES advice on fishing opportunities aims to integrate ecosystem-based management with the objective of achieving maximum sustainable yield (MSY): “We consider the influence of a dynamic ecosystem and multiple fleets on fish stocks and assess and advise on the impact of fisheries on the ecosystem from the coasts to the deep sea and monitor trends in species and habitat biodiversity. We assess the state of fish stocks in a region through fisheries overviews. We put fisheries into the context of other maritime activities and pressures through our ecosystem overviews and provide options for trade-offs between management objectives” [22].

ICES has improved its capacity to deliver ecosystem advice, but it still has many shortcomings, including issues outside its scope. ICES essentially answers questions posed by member states and the EU. This limits the possibilities for enhancing the ecosystem approach and means that there is insufficient administrative and institutional capacity to implement a complex ecosystem approach (i.e., sectoral barriers in fisheries and environmental management and EU member states’ powers). For example, fisheries are mostly in the hands of the EU, but protecting marine ecosystems is decided on and implemented by member states according to the framework of the Marine Strategy Framework Directive (MSFD). ICES has nevertheless been able to incorporate ecosystem views into its advice [16].

3.3. About the MSC

The MSC originated in 1997 from the partnership of a non-governmental environmental organization, the WWF, and one of the world’s largest consumer goods companies, Unilever [6]. Encouraged by the forestry sector’s FSC standard, the WWF decided to work with the largest buyer of frozen fish at the time [19,23]. Their objective was to ensure the long-term viability of commercially significant marine seafood stocks around the world, of which more than 70% were either overexploited, recovering from overexploitation, fully exploited, or depleted [24].

In 1999, the MSC became an independent NGO to increase its credibility as a neutral player in standard setting and accreditation [3]. Its first certified fishery was confirmed in the year 2000 [23]. In the beginning, certain governments attempted to maintain their say on the certification program and its standard-setting monopoly on wild-capture fisheries’ certifications. After doubts and opposition in its early years, the credibility of the MSC gained momentum after adopting the FAO 1995 Code of Conduct for Responsible Fisheries in 2005 [25,26]. Government support has been vital for the organization’s considerable growth and widely recognized legitimacy over the past decade [23,24,26].

Other certification schemes have been introduced after the MSC. They are local-, regional- or species- (e.g., dolphins) specific. The MSC standard builds on international agreements and guidelines, and the MSC is currently the only global wild-capture fishery certification program that meets the best-practice requirements set by the FAO, the Global Sustainable Seafood Initiative (GSSI), and ISEAL [26,27].

As of now, the main governmental structure of the MSC consists of several bodies: the Board of Trustees (BoT), the Stakeholder Advisory Council (STAC), the Technical Advisory Board, the Board Committees, and the Subsidiary Boards [28]. The auditing of the MSC standard is executed by independent, third-party auditors who evaluate the practices based on performance indicators [3]. The principles and criteria forming the basis of all its operations are the result of an extensive consulting process involving more than 300 organizations and individuals, various international workshops located around the world, and two expert drafting sessions [24,28].

The same brand name covers two distinct standards: the MSC Fisheries Standard, founded in 1998 and based on the principles listed above, and the MSC Chain of Custody (CoC) Standard, which came into effect in 2001 [3], verifying the traceability of MSC products from “ocean to plate” [29]. Founded on the MSC Theory of Change, the market advantages gained by ecolabel products in relation to non-certified products (through, e.g., price premiums) incentivize producers to move towards meeting the requirements of the ecolabel. This, in turn, increases the visibility of these products and awareness among consumers, as well as demand in the retail sector and interest in certification. Eventually, this could work as a catalyst for positive environmental impacts [30].

The MSC experienced particularly rapid expansion in its operations towards the end of the 2000s. The introduction of other government policies alongside market demand, NGO pressure, and retailer commitment to increasing the incorporation of sustainable seafood have accelerated MSC uptake [26].

Today, total MSC-engaged (either certified, suspended, or in the process of MSC assessment) catch has reached 16 million tons [31], and the organization is the largest seafood certifier—its 409 certified fisheries (of which 22 were suspended) from 53 countries accounted for 17.4% of global wild marine catch in 2020 [32]. As of fall 2021, there are more than 20,000 products with the MSC label, and 46,205 Chain of Custody certificate-holding sites [31]. According to statistics in 2016 and 2017, over 90% of the certified fisheries, retailers, processors, and customers came from Northwestern Europe and North America. Based on the 2019–2020 annual report of the MSC, however, there has been a 71% increase in engagement in the Global South since 2017, and the volume of MSC-certified catch now accounts for 3.3% of the total amount in this area [32].

The effectiveness of the MSC standard divides supporters and critics [3]. Aspects such as inconsistent certification methodologies, performance indicators leading to incongruent interpretations of criteria and principles, the alleged futility of focusing on environmental improvements if management practices are in place, and MSC contributions to problem solving being modest at best have come under criticism throughout the years [33–35].

3.4. MSC Fisheries Standard

There are three core principles of the MSC Fisheries Standard that must be met by fisheries in order to be certified: (1) sustainably exploited fish stocks, (2) minimized environmental impact, and (3) effective fisheries management [28]. Thus, there are requirements for both the viability of fish stocks and the responsibilities of fishing companies. The first principle considers the sustainability of the exploited fish stock. If the stock is unsustainable or there is insufficient information to assess stock sustainability (for example, risk-based assessment cannot be performed), there is no reason to continue to the actual certification process (Interviews 2021).

The MSC Fisheries Standard Principle 2 (minimizing environmental impact) covers the effect the fishery has on the environment. There are five components to this principle: primary species; secondary species; endangered, threatened, and protected species; habitats; and the structure and function of higher-trophic-level predators within the same ecosystem on which the fishery depends, such as sardines being the prey of, e.g., seals. According to the MSC: “The habitat impacts of a fishery are always considered in an MSC assessment. A fishery cannot be certified if it causes serious damage or irreversible impact on the structure and function of a seafloor habitat. The Standard defines irreversible impact as damage from which a habitat will take 20 years or longer to recover. Assessors also look at the wider ecosystem impacts of the fishery, including the removal of important species that are food for the ecosystem, such as sardines. They also look at the biodiversity and health of the ecosystem and its resilience to change. Simulations of the ecosystem are sometimes used to estimate its status” [27].

The MSC mainly follows the TACs defined for the Baltic Sea by ICES. In addition, the MSC considers ecosystem health more widely, whereas ICES assesses only what is directly requested, i.e., the status of fish stocks and recommended TACs.

3.5. Marine Fishing in Finland

Statistics on Finnish fisheries have been compiled since the 1950s. The catch volumes of Baltic herring, Baltic sprat, cod, and salmon in particular have experienced substantial changes since then. The reasons for these changes have included quotas, shifts in fish stocks, the change from fish as human food to mainly fodder, and developments in fishing technology [36].

There are some 2300 fishermen registered for commercial marine fishing, and about 400 of them catch most of the annual catch. Altogether, the total catch of Finland accounted for 97 million kilograms in 2021—15 million kilograms less than in 2020—of which 77 million kilograms was Baltic herring and 15 million kilograms sprat captured by commercial fishermen registered in Finland (referred to subsequently as Finnish fisheries). Most of the Baltic herring was caught from the Gulf of Bothnia, the gulf between Finland and Sweden [36]. The overall Baltic herring catch in the Baltic Sea was 254,000 in 2020, which is only half of the peak of the early 1980s, and fishing quotas have been steadily diminishing [37]. The herring population of the Gulf of Bothnia is estimated to still be healthy and sustainable, albeit having diminished in the 2010s. In the main basin of the Baltic Sea and the Gulf of Finland, the herring population has dropped to nearly the lowest point since the year 2000 [37].

Most of the commercial fishing regulations originate from the EU. Otherwise, fishing—including leisure fisheries—in Finland is regulated by the Fishing Act (379/2015).

3.6. MSC in Finland

Within Finnish fisheries, currently only Baltic herring and Baltic sprat are certified to the MSC Fisheries Standard. The certification was granted in 2018 after a one-year assessment period. The process was managed by the Finnish Fishermen's Association, SAKL, and carried out by the certification institution Acoura Marine (now part of Lloyd's). In the process, the state of the fish stocks, as well as the environmental effects and management of the fishing, were evaluated. The total costs of the Finnish MSC certification, including audits, for fishing Baltic herring and sprat was about EUR 150,000 (Stakeholder Interview 2021).

As of November 2021, there were 460 supplying companies holding an active Chain of Custody certificate in Finland, based on the information provided by the MSC's Supplier Directory [28].

3.7. Fisheries Regulation in the European Union

Fisheries in the EU are subject to the Common Fisheries Policy (CFP), within which, e.g., the fishing quotas are determined. On a more general level, the EU's Integrated Maritime Policy (COM(2007)575) calls for an inter-sectoral and integrated approach. The Marine Strategy Framework Directive (MSFD) (2008/56/EC) is the core environmental pillar of the still-sectoral EU maritime policies [38]. The goals of the MSFD are to achieve a good environmental status (GES) for the EU's marine waters (originally, by 2020) and to protect the resource base upon which marine-related economic and social activities depend. The healthy stocks of commercially exploited fish populations are one of the indicators for GES. The Water Framework Directive (2000/60/EC) aims to achieve a good ecological status for the inland and coastal waters, leaving the choice of concrete means to member states.

Both directives, the MSFD and the WFD, have GES as the main goal, and both apply an ecosystem-based approach to the management of marine environments. This is realized by various methods: the directives concern all activities affecting waters; take many aspects of ecosystems into account; include the integrative planning of management; and management area boundaries are—at least partly—based on natural ecosystem areas (e.g., whole river basins and common sea areas of several states, urging interstate cooperation) instead of administrative or state boundaries. The Baltic Sea states actively cooperate through HELCOM (the Baltic Marine Environment Protection Commission) [2]. These framework

directives have little direct effect on fishing, but as they aim for good ecological status, they can help to improve and prevent the further deterioration of marine environments, including important spawning areas of fish species, and thus can help to maintain or restore sustainable fish stocks. Despite comprehensive policies and regulation, there is not yet enough knowledge of or protection for essential fish habitats in the Baltic Sea [21].

The Maritime Spatial Planning Directive (2014/89/EU, MSPD) contributes to the management of marine activities and the sustainable use of marine and coastal resources by creating a framework for consistent, transparent, and evidence-based decision making. The directive requires member states to develop maritime spatial plans that coordinate different projects, activities, and the exploitation of marine resources so that sustainability can be achieved. The MSPD emphasizes an ecosystem-based approach in planning, but good environmental status is only mentioned in the recitals, as GES as a goal was removed during the legislative process [39]. The non-binding nature of the maritime spatial plans is a flaw if there is no other, more effective national planning instrument for marine areas [40]. All in all, the role and political weight of fishing in the maritime spatial planning of Finland has been small (Stakeholder Interview 2021).

One of the objectives of the EU Common Fisheries Policy (CFP) is to be compatible with the MSFD. The main method of achieving this is setting exploitation rates and establishing technical measures which define sustainable fishing practices. The CFP also aims to ensure that negative impacts of fishing on the marine ecosystem are minimized.

The EU Common Fisheries Policy has significantly influenced the organization of fisheries in EU member states. Most importantly, the EU sets regional fishing quotas (total allowable catch, TAC) for certain commercially exploited fish. Since the CFP was reformed in 2013, more attention has been paid to the ecosystem approach and avoiding unsustainable fishing practices. However, neither the CFP nor MSFD, nor other EU regulations, have been able to effectively control bycatches and the ecosystem destruction caused by bottom trawling. Furthermore, despite numerous extensive policies and regulations in the EU, fisheries management and nature conservation are not yet integrated in Baltic Sea countries. The poor protection levels of essential fish habitats are an example of the existing shortcomings [21].

Concretely, EU fishing legislation has affected, e.g., the requirements for landing; the compilation of statistics; bycatch and food safety; and increased financial opportunities through the EU Maritime, Fisheries and Aquaculture Fund. In addition, EU regulations have necessitated a lot of new paperwork for Finnish fishers (Stakeholder Interview 2021).

4. Results

4.1. Reasons to Obtain Certification in Finland

Certification needs to confer sufficient advantages, either through wider market reach, retention on the market, or a higher selling price [41,42]. There are no statistics on possible pricing differences in Finland, but according to an interviewee representing the fishing industry, there are currently no price premiums for MSC-certified fish in Finland. Nevertheless, there are other benefits, such as access to the market and image benefits: *“It is difficult to say or estimate direct economic benefits . . . it (certification) is not quite directly visible in the fish price and there are similar experiences in other countries, so it is difficult to say, but it is, firstly, an image benefit for the sector, and also, as I said, central whole sale business started to demand MSC certification and then later the demand has gone down the chain and now also other retailers demand it, and also in foreign trade, like when we have sold raw material abroad, some buyers have demanded that raw material must be MSC-certified”* (Stakeholder Interview 2021).

The change has been remarkable since the 1990s, when businesses did not see any value in certifying fish. In Finland, there are a small number of central wholesale businesses, and therefore all other actors rely heavily on their requirements: *“ . . . for a very long time there was such an attitude that it (certification) is not very important, but many producers have certified their products, so that they can sell MSC and ASC products, and there is a problem that the role of central wholesale business is awfully big, and if they suddenly say that you must have MSC*

and if you are not prepared, you might lose your deal. (...) this is kind of a life insurance, if there is a sudden demand of certification” (Expert Interview 2021).

However, two of our interviewees did not view MSC certification as necessary for Finnish fisheries, because their sustainability is guaranteed otherwise: *“It is a bit like this that we have ICES scientific advice, EU level decisions on quotas, and fish stocks that we are harvesting are sustainable, and so we have not seen need for certification, we have seen it more like a market trick” (Stakeholder Interview 2021).*

Another stakeholder interviewee stated, concerning the whole of Europe, that: *“(t)he key motivation has been reputational I think, and to their own surprise they may also find some benefits in the marketplace, so they could perhaps sell their products easier or sometimes might even find some price premiums” (Stakeholder Interview 2021).*

Fisheries have also been certified because Finnish aquaculture is trying to obtain ASC (Aquaculture Stewardship Council) certification, and for ASC, the fish must also be certified. There are also restaurant chains that sell only, or chiefly, MSC-certified fish. For them, demand does not come from wholesale business or other business actors. Rather, it is a question of image and willingness to make the business more sustainable (Stakeholder Interview 2021).

4.2. EU and Sustainable Fishing Quotas

The EU defines the total allowable catch (TAC), which in turn determines national quotas for commercial saltwater fishing in the Baltic Sea and other sea areas. The final decision is a political decision by the Council, which is preceded by a scientific assessment and hearing procedures. First, national scientific organizations collect data on fish stocks. In the Baltic Sea, the main species are Baltic herring, Baltic sprat, and salmon. Second, the working group of ICES assesses the state of a fish stock and drafts advice. Then, after a scientific peer review, the Advisory Committee of ICES adopts and publishes the finalized advice. Member states, NGOs, other stakeholders, and the STECF (Scientific, Technical and Economic Committee for Fisheries) of the EU Commission can offer their opinion, and after this, the Commission offers its proposal for TACs. The European Council then makes the final decision on the TACs. National quotas are based on TACs and permanent national shares (%). Member states can then nationally allocate quotas to fishing companies.

Within the EU, the role of ICES has increased over the last ten years, especially due to the CFP. Only after adopting the MSFD in 2008 and the CFP reform in 2013 was the ecosystem approach embedded in the EU policy framework.

Nowadays, it is less common that national, economic, or other interests prevail over the scientific advice of ICES [43] (Interviews 2021). An expert interviewee noted that: *“In the Finnish parliament there has already for a long time been consensus that Finland will negotiate in the EU based on ICES advice. But there are exceptions. Sometimes other things are more important than following the scientific advice” (Expert Interview 2021).* Nevertheless, some TACs agreed by the Council still exceed ICES recommendations: *“Over the last eight years, the overall proportion of agreed TACs that exceeded the advised levels was relatively stable, remaining at around 60%” [43].* Thus, political interests still regularly prevail over science. According to the same research, which covered the years 2010–2017, the difference between the TACs set by the European Council and ICES has been, to some extent, smaller for Baltic Sea fisheries than for southern and western waters and the North Sea [43]. However, three interviewees brought up the important role of the politicians: ICES only answers the questions asked, and the formulation of questions affects what kind of answers and advice ICES provides (Interviews 2021).

4.3. MSC and the Sustainability of Fishing

The credibility and integrity of the MSC certification in the Baltic Sea was not questioned by any of our interviewees. On the contrary, the views of environmental NGOs have also been well considered during the auditing processes (Stakeholder Interview 2021). The certification process of herring and sprat was considered to be thorough and forced

the involved research institute to reassess their sample collection techniques. An expert interviewee also noted that MSC criteria for TAC are, in some respects, stricter than those of ICES: *“Not really, maximum sustainable yield is generally accepted, but there are different emphases on other impacts of fishing, such as bycatch. ICES advice has traditionally focused on the state of one fish species, even if now the importance of ecosystem approach is increasing. But not as much as in MSC, which much more considers the effects of fishing on e.g., bycatch or birds”* (Expert Interview 2021).

As previously mentioned, Baltic herring is experiencing trouble in the southern parts of the Baltic Sea, possibly as a consequence of higher water temperatures resulting from climate change. The reproductive success of the herring has decreased remarkably since 2004 [44].

The certification process for main-basin Baltic herring has been self-suspended. The reason for this is that ICES conducted an assessment of the fish stock in May 2021 [45], and, based on this assessment, the certification company, Lloyd’s, stated that Central Baltic herring does not currently fulfill the MSC certification criteria. In July 2021, the certification holder SAKL asked for a so-called self-suspension for Baltic herring in the main basin. The suspension came into effect on the 15th of September 2021 [46]. The herring population of the Gulf of Bothnia is healthy, and these fisheries are still MSC-certified.

Finnish fishing of Baltic herring in the main basin of the Baltic Sea is still, however, ongoing. Despite the EU 2022 quota for Finland being almost half that of 2021 [47], fishing is occurring as normal in the main basin [48].

A stakeholder interviewee reminded us that that this situation emphasizes the responsibility of retailers: *“I think that the biggest challenge is that some fisheries have backslided, so dropped out of the MSC program because they no longer met the standard because they are overfishing again. (...) Specially in Germany but also in the Nordic markets where for instance marinated herring is on the shelves of all the retailers, retailers face a very big choice; they need to potentially source from all the fisheries that are still carrying the MSC certification that are still sustainable, but that may require the recipes of these products to be changed, because the raw material is not identical to what they currently use; or they need to take off the MSC logo and source from fisheries that currently overfish and don’t follow scientific advice. But that would no longer be aligned with their own ESG policies.”*

In Finland, the MSC has not significantly altered fishing methods. Finnish fishers were already bound by EU regulations, quotas, and surveillance, and, according to several interviewees, EU surveillance will increase in the coming years (Interviews 2021). Nevertheless, as already mentioned, the TACs defined by the EU have not always followed the scientific advice of ICES [43]. Therefore, the MSC can be seen as a more reliable guarantee that scientific knowledge on fish stocks has been taken seriously.

According to three interviewees, including one researcher, the MSC has reinforced the importance of scientific advice from ICES. EU member states and other stakeholders have been more willing to support smaller quotas following ICES advice within the EU and in, e.g., the Baltic Sea Advisory Group, whose main function is to advise the European Commission and member states on matters relating to the management of fisheries in the Baltic Sea (Interviews 2021). Thus, the effects of different policies on the MSC were considered by various stakeholders in our discussions.

A stakeholder interviewee argued that MSC-certified companies: *“(…) lobby ministries to adopt recovery plans, or they make sure that the TAC advice from ICES is being followed, rather than challenging that advice in terms of “hey, there’s much more fish in the sea—what the scientists came up with is nonsense”* (Stakeholder Interview 2021). Another stakeholder said: *“I dare to claim that MSC certification brought some kind of extra pressure on commercial fisheries. Now they ponder more the possibility that okay, if now scientific advice is that the quota of herring should be cut by 20%, and before certification they would have been like “no way, not in any case”, and they could accept 2–5% cut in quota, but now they ponder more what they are ready for themselves, as the other side of the coin is that they might lose MSC certification, and economic losses related to that”* (Stakeholder Interview 2021).

According to four interviewees, MSC policy on TAC is stricter and more inclusive than ICES policy: *“It (MSC) has many effects, on generally increasing the awareness on sustainable fishing. Also, the requirements of the (MSC) certificate are rather strict, and in the case of Finland or Baltic Sea, it is not only about assessing on single fish species and keeping it on MSY level, but as for herring and sprout, we did most of the work concerning bycatch, which is not considered so much in ICES advice, especially concerning herring and sprout. Bycatch species are species that are not assessed by ICES and perhaps therefore they get less attention there.”* (Expert Interview 2021).

MSC takes into account bycatch and fishing methods, as well as possible restrictions on fishing efforts or specific impacts on fishing techniques. The reporting of fish catches and bycatch has allegedly improved after MSC involvement, e.g., the proportion of herring and sprat caught at the same time. As much as bycatch assessment affects TAC assessment within MSC, according to an expert interviewee, improved knowledge on bycatch has not yet affected Finnish fishing but may in the future affect Finnish quotas: *“As for Finnish herring and sprat, it (MSC) has not yet affected fishing tools, but it has changed the amount of information on bycatch, and we will see in future whether there will be need to change”* (Expert Interview 2021). The MSC has necessitated some extra surveillance measures for Finnish fisheries, e.g., researchers of the Finnish Natural Resources Institute Luke are more often onboard, which has, according to two interviewees, improved the quality of reporting. The MSC does not require significant extra paperwork from fishermen, as the group certificate holder SAKL carries out all the extra reporting and other paperwork.

The MSC has not substantially affected the methods of Finnish fishing, as there is no bottom trawling in the Finnish fishing quota in the Baltic Sea, and therefore certified Finnish fishing has not affected underwater habitats. Harbor porpoise is the main endangered species of concern in the Baltic Sea. The latest MSC surveillance audit indicated that Finnish trawling vessels very rarely fish in the risk areas, and the risk of harbor porpoise capture by Finnish MSC-certified trawlers is therefore very low. The audit report also stated that there have been no reports of interactions with endangered, threatened, or protected species over the period 2019–2021 [49]. The self-reporting numbers might be somewhat misleading, though, as a report based on questionnaires filled in by non-certified coastal fishermen showed that not all endangered bycatch is officially reported [50].

According to the interviews, the biggest effect of MSC on Finnish fishing in the Baltic Sea is the increased attention to bycatch. While ICES and the EU pay most attention to the sustainable yield of commercially caught fish stock, the MSC requires more effective surveillance of and reduction in bycatch. Based on what was mentioned previously, it seems that in the Baltic Sea, the bycatch criteria of the MSC have a greater effect on the estimation of TAC as a part of ecosystem health than on fishing methods.

Even if bycatch is a typical example of multi-species management, it is also part of the ecosystem approach in the MSC scheme. Other examples of the ecosystem approach within the MSC are the strong attachment to scientific advice—stronger than in EU fisheries policies. For example, herring is still being fished in the main basin of the Baltic Sea. Though the EU has considerably lowered the TAC of herring, the MSC certification of the main-basin herring has been self-suspended due to the suggestions of ICES and Lloyd’s.

Other important elements of the ecosystem approach are the balance between sustainable use and conservation, and governance within ecologically meaningful boundaries. The MSC cannot establish new marine protected areas, but it can take marine areas into consideration in a more holistic manner than states and the EU. The MSC considers fish stock as such, and take fisheries of all jurisdictions into account, whereas the EU can only regulate the fishing of its member states. The suspension of the MSC certification of the Atlanto-Scandian herring was the result of EU member states and non-member states not being able to agree on national fishing quotas, which exceeded the scientific advice by 32% in 2019 [32].

4.4. MSC and Criticism

Internationally, the MSC has been criticized for various reasons, but none of our interviewees criticized Finnish MSC certificates for ecological unsustainability. Nevertheless, despite still principally trusting and supporting the MSC, the WWF no longer provides warrant support to all MSC-certified fisheries in the WWF seafood guides.

The international WWF decided that it will conduct its own desktop studies on the sustainability of fish stocks as the basis for its seafood guides. Disagreements on the sustainability assessment of certain fish stocks were the reason for the global-level withdrawal of the previously unquestioned support of the MSC. Such a precautionary decision was made even though MSC stock assessments are, in general, more thorough and case-specific than those of the WWF (Stakeholder Interview 2021).

Two interviewees were worried about the reputational harm that WWF's withdrawal could cause, e.g., among Finnish supermarket chains if they require additional guarantees from the fishing industry. This could occur in individual cases, but on a large scale, this could be a groundless fear, as retailers will need MSC certification as a proof of origin anyway. Due to Chain of Custody certificates, purchasers and consumers who buy MSC-certified fish know that they are most likely receiving sustainably harvested fish. Scientific knowledge—approved either by scientific organizations or ENGOs—suggesting that certain fisheries are sustainable does not prove that the particular fish in the supermarket originates from a sustainable fishery. This emphasizes the importance of certification even if WWF International has withdrawn the direct link between the WWF seafood guides and MSC certification.

There was some criticism on economic and social grounds among the stakeholder interviewees: the certification standard was said to be burdensome, expensive, and unsuitable for much of Finnish fishing, which is small-scale and fragmented. There is hope that, in the future, some of the fresh-water fisheries could be certified as artisanal fisheries (Interviews 2021). The MSC has been criticized for not including socio-economic and labor issues in its standard. In 2019, the MSC added new labor requirements for its Chain of Custody certification. There seems to be no need for further social criteria for Finnish fisheries, but internationally, more stringent social criteria are still desired (Interviews 2021) [51].

The certification of only the biggest catches—in the case of Finland, herring and sprat—can also have unintended effects on what fish species are being fished. In Finland, for example, most of the herring and sprat are used as animal fodder [36]. However, there are other fish, such as three-spined stickleback, that are suitable for fodder, while herring and sprat are better for human consumption (Expert interview 2021). As ASC-certified fish farming requires MSC-certified fodder, this could limit the choice of fodder fish to herring and sprat, even if, in some cases, it would be better ecologically to fish multiple species. The certification process is expensive. The thoroughness makes it more reliable, but it also makes fisheries less responsive to ecological, social, and economic changes in the operating environment. Thus, the MSC can only verify the sustainability of a certain fishery and cannot—like any other current governance system—affect commercial fishing such that, for example, an ecologically optimal mixture of species is annually fished.

5. Discussion

Indirect but noteworthy effects of the MSC include the increased awareness and weight of ICES advice on sustainable maximum yield and the effect it has on the willingness of national stakeholders to support sustainable fishing policy in order not to jeopardize their certification. Supporting larger quotas and more fishing could mean losing the certification. Thus, in national and intergovernmental negotiations, voices for more sustainable fishing are more common than they were previously (Interviews 2021).

There is a consensus on the need to adopt ecosystem-based management for marine environments to achieve socio-ecologically sustainable societies and healthy ecosystems. Nevertheless, there is no easy way to achieve holistic and effective ecosystem-based management with complex socio-ecological systems. In the Baltic Sea and other EU-related sea

areas, the EU has not yet been fully successful in its aim of implementing an ecosystem approach and ecosystem-based management. Different economic and social interests are pulling management in different directions, and, even when assessing decision making in very specific terms—e.g., fishing quotas—the EU sometimes has difficulties in keeping within sustainable limits [43].

As for the case of Baltic herring, the MSC follows the precautionary principle more closely than the EU by carefully heeding scientific advice and including more metrics when assessing sustainability—e.g., always taking bycatch into account when assessing the sustainability of an annual catch. The stricter interpretation of sustainability has led to the self-suspension of the certification in some Finnish fisheries. Nevertheless, fishing continues according to the reduced EU quotas even without the MSC certificate.

The sustainability of fisheries policies is defined in both public and private spheres. All policy and legal instruments discussed in this article are based on science, i.e., assessments of ICES, but the conclusions and effects of science on policies and regulations vary. In the public sphere, the most important actors are the EU and its members states. In the private sphere, there are the MSC, non-governmental organizations (such as trade unions and WWF), and the business sector. In the interplay of science and political decision making, the MSC can reinforce the effects of science. According to our research, even if the MSC has not had a significant effect on Finnish fishing practices in the Baltic Sea, it has increased knowledge of catch and bycatch and, most importantly, increased the awareness and weight of ICES advice on sustainable maximum catch. The MSC supports the role of science-based ICES advice in defining TACs. In turn, the MSC might also increase the weight of the ecosystem approach in fisheries management in the EU and beyond.

Although the MSC can improve the implementation of the sustainability aims of MSFD and Common Fisheries Policy from the fishing point of view, a holistic ecosystem approach to marine environments requires states to employ more effective protection and conservation measures than those currently in place. Even if the MSC seems to apply an ecosystem approach more consistently than the EU, it cannot prevent unsustainable fishing in marine areas that are not directly affected by certified fishing.

Sadly, Russia's war in Ukraine has also had impacts on fisheries. The price of fuel in particular has reduced the profitability of commercial fishing. Almost half of Finnish fish and fish feed exports have been to Belarus, Russia, and Ukraine in 2021. The total amount of exported fish has decreased due to the war, but exports of herring and sprat to Eastern Europe are recovering. The effect of changes in exports on Finnish MSC certification is probably small, however, as the countries mentioned above have not demanded certification [52].

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Appendix A

Stakeholder interviews: representatives of KKL (the Federation of Finnish Fisheries Association) (2 interviewees), Kotipizza Group (1), MSC Europe (1), MSC Finland (1), SAKL (Finnish Fishermen’s Association) (1), and WWF Finland (1).

Expert interviews: science representatives of the University of Jyväskylä, Finland (2 interviewees) and Luonnonvarakeskus (Finnish Natural Resources Institute) (2).

References

1. European Commission. EU Biodiversity Strategy for 2030. COM(2020) 380 Final. Available online: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0380> (accessed on 10 February 2022).
2. HELCOM. Baltic Sea Action Plan—2021 Update. Available online: <https://helcom.fi/media/publications/Baltic-Sea-Action-Plan-2021-update.pdf> (accessed on 22 February 2022).
3. Wijen, F.; Chiroleu-Assouline, M. Controversy over Voluntary Environmental Standards: A Socioeconomic Analysis of the Marine Stewardship Council. *Organ. Environ.* **2019**, *32*, 98–124. [CrossRef]
4. FAO. The State of World Fisheries and Aquaculture 2016. Contributing to Food Security and Nutrition for All. Rome. 2016. Available online: <http://www.fao.org/3/i5555e/i5555e.pdf> (accessed on 22 February 2022).
5. Oosterveer, P.; Spaargaren, G. Organising consumer involvement in the greening of global food flows: The role of environmental NGOs in the case of marine fish. *Environ. Politics* **2011**, *20*, 97–114. [CrossRef]
6. Owens, C.M. Sustainable Seafood Labeling: An Analysis of the Marine Stewardship Council. Graduate School of International Relations and Pacific Studies. University of California, San Diego, IR/PS Case, 07-02. 2008. Available online: <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.492.1928&rep=rep1&type=pdf> (accessed on 9 December 2021).
7. Kirby, D.S.; Visser, C.; Hanich, Q. Assessment of eco-labelling schemes for Pacific tuna fisheries. *Mar. Policy* **2014**, *43*, 132–142. [CrossRef]
8. Ward, T.J. Barriers to biodiversity conservation in marine fishery certification. *Fish Fish.* **2008**, *9*, 169–177. [CrossRef]
9. Selden, R.L.; Valencia, S.R.; Larsen, A.E.; Cornejo-Donoso, J.; Wasserman, A.A. Evaluating seafood eco-labeling as a mechanism to reduce collateral impacts of fisheries in an ecosystem-based fisheries management context. *Mar. Policy* **2016**, *64*, 102–115. [CrossRef]
10. Murphy, E.L.; Bernard, M.; Gerber, L.R.; Dooley, K.J. Evaluating the role of market-based instruments in protecting marine ecosystem services in wild-caught fisheries. *Ecosyst. Serv.* **2021**, *51*, 101356. [CrossRef]
11. Froese, R.; Proelss, A. Evaluation and legal assessment of certified seafood. *Mar. Policy* **2012**, *36*, 1284–1289. [CrossRef]
12. Morishita, J. What is the ecosystem approach for fisheries management? *Mar. Policy* **2008**, *32*, 19–26. [CrossRef]
13. Farmer, A.; Mee, L.; Langmead, O.; Cooper, P.; Kannen, A.; Kershaw, P.; Cherrier, V. The Ecosystem Approach in Marine Management. EU FP7 KNOWSEAS Project. 2012. Available online: <https://www.msfd.eu/knowseas/library/PB2.pdf> (accessed on 14 February 2022).
14. Van Leeuwen, J.; Raakjaer, J.; van Hoof, L.; van Tatenhove, J.; Long, R.; Ounanian, K. Implementing the Marine Strategy Framework Directive: A policy perspective on regulatory, institutional and stakeholder impediments to effective implementation. *Mar. Policy* **2014**, *50*, 325–330. [CrossRef]
15. Cowan, J.H., Jr.; Rice, J.C.; Walters, C.J.; Hilborn, R.; Essington, T.E.; Day, J.V., Jr.; Boswell, K.M. Challenges for Implementing an Ecosystem Approach to Fisheries Management. *Mar. Coast. Fish.* **2012**, *4*, 496–510. [CrossRef]
16. Ballesteros, M.; Chapela, R.; Ramírez-Monsalve, P.; Raakjaer, J.; Hegland, T.J.; Nielsen, K.N.; Laksá, U.; Degnbol, P. Do not shoot the messenger: ICES advice for an ecosystem approach to fisheries management in the European Union. *ICES J. Mar. Sci.* **2018**, *75*, 519–530. [CrossRef]
17. United Nations, Division for Ocean Affairs and the Law of the Sea: Ecosystem Approaches. (Updated 21 July 2010). Available online: https://www.un.org/depts/los/ecosystem_approaches/ecosystem_approaches.htm (accessed on 4 February 2022).
18. Secretariat of the Convention on Biological Diversity (2004) The Ecosystem Approach, (CBD Guidelines) Montreal: Secretariat of the Convention on Biological Diversity. Available online: <https://www.cbd.int/doc/publications/ea-text-en.pdf> (accessed on 10 January 2022).
19. Garcia, S.M.; Zerbi, A.; Aliaume, C.; Do Chi, T.; Lasserre, G. *The Ecosystem Approach to Fisheries. Issues, Terminology, Principles, Institutional Foundations, Implementation and Outlook*; FAO Fisheries Technical Paper. No. 443; FAO: Rome, Italy, 2003; 71p.
20. Virtanen, E.A.; Viitasalo, M.; Lappalainen, J.; Moilanen, A. Evaluation, gap analysis, and potential expansion of the Finnish marine protected area network. *Front. Mar. Sci.* **2018**, *5*, 402. [CrossRef]
21. Kraufvelin, P.; Pekcan-Hekim, Z.; Bergström, U.; Florin, A.-B.; Lehikoinen, A.; Mattila, J.; Arula, T.; Briekmane, L.; Brown, E.J.; Celmer, Z.; et al. Essential coastal habitats for fish in the Baltic Sea. *Estuar. Coast. Shelf Sci.* **2018**, *204*, 14–30. [CrossRef]
22. ICES. ICES and Ecosystem-Based Management. 2020. Available online: <http://doi.org/10.17895/ices.pub.5466> (accessed on 10 February 2022).
23. Gulbrandsen, L.H. Mark of Sustainability? Challenges for Fishery and Forestry Eco-labeling. *Environ. Sci. Policy Sustain. Dev.* **2005**, *47*, 8–23. [CrossRef]
24. Gulbrandsen, L.H. The emergence and effectiveness of the Marine Stewardship Council. *Mar. Policy* **2009**, *33*, 654–660. [CrossRef]

25. Sutton, M. The Marine Stewardship Council: New hope for marine fisheries. *Naga ICLARM Q.* **1996**, *19*, 10–12.
26. Gulbrandsen, L.H. Dynamic governance interactions: Evolutionary effects of state responses to non-state certification programs. *Regul. Gov.* **2014**, *8*, 74–92. [[CrossRef](#)]
27. MSC. How We Meet Best Practice. Available online: <https://www.msc.org/about-the-msc/how-we-meet-best-practice> (accessed on 4 March 2022).
28. MSC. Our Governance. Available online: <https://www.msc.org/about-the-msc/our-governance> (accessed on 16 September 2021).
29. Gale, F.; Haward, M. Public Accountability in Private Regulation: Contrasting Models of the Forest Stewardship Council (FSC) and Marine Stewardship Council (MSC). In Proceedings of the Australasian Political Studies Association Conference, University of Adelaide, Adelaide, Australia, 29 September–1 October 2004. Available online: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.453.4558&rep=rep1&type=pdf> (accessed on 30 November 2021).
30. Arton, A.; Leiman, A.; Petrokofsky, G.; Toonen, H.; Longo, C. What do we know about the impacts of the Marine Stewardship Council seafood ecolabelling program? A systematic map. *Environ. Evid.* **2020**, *96*. [[CrossRef](#)]
31. MSC. Developments in the MSC Program. Available online: https://www.msc.org/docs/default-source/fi-files/1_kest%C3%A4v%C3%A4nkalanp%C3%A4iva_2021_eb.pdf?Status=Master&sfvrsn=ed1f6916_3 (accessed on 20 September 2021).
32. MSC. Celebrating and Supporting Sustainable Fisheries: The Marine Stewardship Council Annual Report 2019–20. Available online: <https://www.msc.org/docs/default-source/default-document-library/about-the-msc/msc-annual-report-2019-2020.pdf> (accessed on 17 September 2021).
33. Kalfagianni, A.; Pattberg, P. Global fisheries governance beyond the State: Unraveling the effectiveness of the Marine Stewardship Council. *J. Environ. Stud. Sci.* **2013**, *3*, 184–193. [[CrossRef](#)]
34. Marko, P.B.; Nance, H.A.; Guynn, K.D. Genetic detection of mislabeled fish from a certified sustainable fishery. *Curr. Biol.* **2011**, *21*, R621–R622. [[CrossRef](#)]
35. Stolle, D.; Micheletti, M. Political Consumerism: Global Responsibility in Action. 2013. Available online: <https://ebookcentral.proquest.com/lib/fei-ebooks/reader.action?docID=1182936&ppg=1> (accessed on 17 September 2021).
36. Luke (Natural Resources Institute Finland). Kaupallinen Kalastus Merellä. 2021. Available online: <https://www.luke.fi/fi/tilastot/kaupallinen-kalastus-merella/kaupallinen-kalastus-merella-2021> (accessed on 2 June 2022).
37. Raitaniemi, J.; Sairanen, S. (Eds.) *Kalakantojen Tila Vuonna 2020 Sekä Ennuste Vuosille 2021 ja 2022: Silakka, Kilohaili, Turska, Lohi, Meritaimen, Siika, Kuha, Ahven ja Hauki*; Luonnonvara ja biotalouden tutkimus 61/2021; Natural Resources Institute: Helsinki, Finland, 2021. Available online: <https://jukuri.luke.fi/handle/10024/547767> (accessed on 12 February 2022).
38. Rudd, M.A.; Dickey-Collas, M.; Ferretti, J.; Johannesen, E.; Macdonald, N.M.; McLaughlin, R.; Rae, M.; Thiele, T.; Link, J.S. Ocean ecosystem-based management mandates and implementation in the North Atlantic. *Front. Mar. Sci.* **2018**, *5*, 485. [[CrossRef](#)]
39. Jones, P.J.S.; Lieberknecht, L.M.; Qiu, W. Marine spatial planning in reality: Introduction to case studies and discussion of findings. *Mar. Policy* **2016**, *71*, 256–264. [[CrossRef](#)]
40. Pappila, M.; Puharinen, S.-T. Meriluonnon Suojelun Säätely: Merellisen Luonnon Suojelun, Merenhoidon ja Vesienhoidon Yhteensovittaminen EU- ja Suomen Oikeudessa. 2022. Ministry of the Environment. Available online: <http://urn.fi/URN:ISBN:978-952-361-242-6> (accessed on 11 April 2022).
41. Luke (Natural Resources Institute Finland). Kansainvälisten Kalastuksen Kestävyyssmallien Soveltuvuus Suomen Sisävesikalastukseen: Järvikalan Jäljet—Saalistietoa ja Kestävyyttä Hanke. 2019. Available online: <https://jukuri.luke.fi/handle/10024/543808> (accessed on 20 September 2021).
42. Finnpartnership. Frozen Fish and Crustaceans in Finland. 2019. Available online: <https://finnpartnership.fi/wp-content/uploads/2019/11/Frozen-fish-and-crustaceans-in-Finland.pdf> (accessed on 1 June 2022).
43. Borges, L. Setting of total allowable catches in the 2013 EU common fisheries policy reform: Possible impacts. *Mar. Policy* **2018**, *91*, 97–103. [[CrossRef](#)]
44. Polte, P.; Gröhsler, T.; Kotterba, P.; von Nordheim, L.; Moll, D.; Santos, J.; Rodriguez-Tress, P.; Zablotzki, Y.; Zimmermann, C. Reduced Reproductive Success of Western Baltic Herring (*Clupea harengus*) as a Response to Warming Winters. *Front. Mar. Sci.* **2021**, *8*, 589242. [[CrossRef](#)]
45. ICES. Herring (*Clupea harengus*) in Subdivisions 25–29 and 32, Excluding the Gulf of Riga (central Baltic Sea). In Report of the ICES Advisory Committee, 2021. ICES Advice 2021, her.27.25–2932. Available online: <https://doi.org/10.17895/ices.advice.7767> (accessed on 16 January 2022).
46. SAKL (Finnish Fishermen’s Association). Suomen Silakan ja Kilohailin MSC-Sertifioitu Kalastus. Available online: <http://sakl.fi/msc/> (accessed on 12 March 2022).
47. SAKL (Finnish Fishermen’s Association). Vuosivertailu. Available online: <http://sakl.fi/vuosivertailu/> (accessed on 22 March 2022).
48. SAKL (Finnish Fishermen’s Association). Tilannevertailu. Available online: <http://sakl.fi/tilannevertailu/> (accessed on 22 March 2022).
49. Acoura Marine t/a LRQA: FFA Finland Baltic Herring & Sprat. 3rd Surveillance Report. Available online: <https://fisheries.msc.org/en/fisheries/finland-baltic-herring-sprat/@assessments> (accessed on 2 June 2022).

50. Olin, M.; Moilanen, P.; Rahikainen, M.; Seimola, T.; Söderkultalahti, P.; Tiainen, J. Kyselytutkimus Kaupallisten Kalastajien Saamasta Lintusivusaaliista Merialueella 2019. Luonnonvara ja Biotalous Tutkimus 74/2021. Luonnonvarakeskus. Available online: https://jukuri.luke.fi/bitstream/handle/10024/547909/luke-luobio_74_2021.pdf?sequence=1&isAllowed=y (accessed on 1 June 2022).
51. Ponte, S. The Marine Stewardship Council (MSC) and the making of a market for 'sustainable fish'. *J. Agrar. Change* **2012**, *12*, 300–315. [[CrossRef](#)]
52. Setälä, J.; Saarni, K. Ukrainan Sodan Vaikutuksia Kalatalouteen. Luke (Natural Resources Institute Finland). Situation Report 23 May 2022. Available online: <https://merijakalatalous.fi/wp-content/uploads/Ukrainan-sodan-vaikutuksia-kalatalouteen-23.5.2022.pdf> (accessed on 30 May 2022).