



**BSRAC seminar on ecosystem based management
National Marine Fisheries Research Institute (NMFRI)
Gdynia 25-26 September 2012**

Moderator Steve Karnicki (NMFRI)

Rapporteur Marmar Nekoro (BNI/Stockholm Resilience Centre)

The aim of the BSRAC seminar on ecosystem based management was to discuss the implication of ecosystem based management for Baltic Sea fisheries. The seminar gathered 73 participants from around the Baltic Sea, representing a broad range of stakeholders, scientists and decision makers (see list of participants at the end of the report, together with a letter from MEP Jarosław Leszek Wałęsa, (EPP), with his apologies, but supporting the event).

This document summarises the presentations and discussions from the seminar. For additional information, please visit the [BSRAC website](#) where all the presentations are available. If you are interested in more comprehensive documentation from the seminar, please contact the rapporteur. A beginner's guide to the ecosystem approach from the Convention on Biological Diversity is available at: <http://www.cbd.int/ecosystem/sourcebook/beginner-guide/>

Future meetings of potential interest

- * 9 October: ICES workshop to identify trade-off options to be investigated in North Sea and Baltic multispecies assessments in autumn. (BSRAC + NSRAC + PELRAC)
- * 27-28 Feb 2013: 2 day seminar to develop guidelines for multi-species management (ICES + Nordic Council of Ministers)

Abbreviations used in the summary:

BSAP - Baltic Sea Action Plan

CFP - Common Fisheries Policy

CBD - Convention on Biological Diversity

COM – EU Commission

EA - ecosystem approach

EAFM - ecosystem approach to fisheries management

EAM - ecosystem approach to management

FM - fisheries management

GES - Good Environmental Status

MS – Member States

MSFD - Marine Strategy Framework Directive

MSP - Marine Spatial Planning

MSY – Maximum Sustainable Yield

SSB - Spawning Stock Biomass

Overall conclusions from the seminar

- The overarching objective of the MSFD is to have GES and everyone, including the BSRAC, agrees on this.
- The EAFM is a continuous process, involving science from different disciplines and different stakeholders, and should continue to develop and form one piece of the puzzle of reaching GES.
- There is sufficient knowledge in some areas, but more science is still needed, not least regarding food web interactions and the influence on the ecosystem and thus on fisheries due to impacts from e.g. leakage of nutrients and hazardous substances.
- Many elements of the EA are already in place (e.g. technical measures, closed areas and closed periods), others will be implemented through the new CFP (e.g. discard ban, multiannual multispecies plans).
- The fisheries sector is not the only user of the Baltic Sea ecosystem, so a broad and open discussion and dialogue with other sectors is needed (not least as part of the MSFD), but it is still unclear who will take the lead. In order to have the necessary leverage, it should be the prime ministers (i.e. governments) who take the lead, as it is the obligation of governments and intergovernmental organizations to facilitate such discussions.
- Stakeholder bodies such as the BSRAC should help facilitate this process and dialogue, as it is essential for managers and decision makers to implement the results from this dialogue in a legal framework.

Summaries of presentations and discussions, with some key questions/comments after the respective presentations.

Day 1: Knowledge science and the ecosystem approach

Wojciech Pelczarski (Deputy Director, National Marine Fisheries Research Institute (NMFRI)) opened the meeting and welcomed the BSRAC to the NMFRI, after which he continued by raising a couple of points regarding limitations and threats to fishing.

Sea fishing is often perceived as an activity that can negatively affect ecosystems, not least by “ecologists” and “greens”, but **correct fishing activities promote well-being and provide important benefits for society**. The reform of the CFP aims, among other things, to reduce the pressure exerted by the fishery on the exploited resources and on the environment through components such as “no discards”, MSY and EAFM. But we must remember that these principles, albeit beneficial to the environment, will also put limitations on fishermen. It is therefore of critical importance to discuss how these principles should be applied in order to provide protection for the environment, but also to make it possible for fishermen to continue their work and legacy.

Dr. Henrik Österblom ([Stockholm Resilience Centre](#)) gave a presentation on the history and principles of the EA, explaining that EA and EAM is nothing new. He explained how these approaches aim to balance diverse societal objectives while conserving the capacity (resilience) of ecosystems. He explained that ecosystems are dynamic, and that changes can be irreversible and non-linear by showing examples of regime shifts that have occurred in the Baltic Sea during the 20th century. He also showed examples of how fishing directly and indirectly causes major influences on other parts of the ecosystem, e.g. how low fish stocks negatively affect recruitment of seabirds. He pointed out that considering multiple external influences, taking into account ecosystem knowledge and uncertainty, as well as understanding that humans are part of the system is the key and that MSP can be one tool in implementing EAM. It is thus crucial to incorporate stakeholders’ perception and priorities and the EA is therefore a necessary opportunity for the BSRAC to voice its knowledge and opinions.

The BSRAC is an important forum for discussing trade-offs between sectors in the Baltic Sea, for initiating collaboration (there is a need for both scientific knowledge and co-production of knowledge with fishermen and other stakeholders), to better integrate and contribute with better data as higher uncertainty will result in lower quotas, to contribute to policy coherence (e.g. as several descriptors for GES under the MSFD have direct relevance for fisheries), and to start to identify critical fisheries and to accept a future with MSP. The **BSRAC has important**

knowledge, experience and capacity that will facilitate the implementation of the policies. We cannot wait for perfect knowledge. Ecosystems are influenced by complex causes, and together with developing tools, different options can be investigated. So take the opportunity and steer in the right direction - but don't forget the precautionary approach!

Questions/comments: Q: One question raised was how we can justify that nature is in balance when non-equilibrium ecology is emerging? How will this change our perception? And regarding alternative stable states, what state is acceptable for society? Dr Österblom responded that this is a constant struggle for ecologists, as the perception often remains that nature operates in equilibrium. Society sometimes falls into the trap of nostalgia, e.g. using the 1980s peak of cod as a reference point, but we need to remember that reference points change over time. It's important to now understand (both in ecology and decision making) that nature is actually in a non-equilibrium and that some changes are irreversible. Ultimately society needs to make the decision whether we are willing to sacrifice some species and save others.

Dr. Michele Casini ([Swedish University of Agricultural Science](#) and chair of WGBFAS) gave a presentation on Baltic Sea biodiversity and species interactions and discussed why an integrated approach is needed. Due to the low biodiversity of the Baltic Sea, there are strong linkages between biological components, making the ecosystem sensitive to even small changes in external pressure. The EA and EAFM, where both external pressures as well as food webs and species interaction are considered using multi-species approaches in stock management, are already used in the Baltic (e.g. cod mortality in the analytical stock assessment of sprat and herring). He showed how fishing pressure, seals, nutrients and climate have influenced the status of the main target species during the last decades. He also mentioned that some indirect effects on the ecosystem have been detected, as density-dependent growth has affected lower trophic levels through so-called trophic cascades. These point to the importance of considering feedbacks in the ecosystem, as these can also affect the target species (e.g. food competition and egg predation negatively affect cod stocks). "Slim cod" in the southern Baltic Sea have been hypothesized to be a result of food shortage. Recently, these slim cod have also been found in areas with abundant food, indicating that food limitation is probably not the only factor. He concluded that EA is a continuous process and one important characteristic regarding human activities and pressures is the integration and prioritization between goals and sectors. These trade-offs are a political decision, and he also stressed that the BSRAC has an important role to play.

Questions/comments: Q: Is it possible that jellyfish influence stocks in the Baltic? Could the "slim cod" also be a reproductive issue (i.e. be younger age groups)? Shouldn't a multi-species model include more than just three species of fish? Dr. Casini responded that due to e.g. low salinity and thus growth size, he did not view biomass of jellyfish to cause problems for pelagic fish in the Baltic. There have been changes in the spawning time for

cod, leading to a shorter period for growth, which could affect size and thus result in slim cod, but it seems that the size of cod is decreasing in all sizes and age classes. There is currently not enough data to include more species as this would jeopardize uncertainty and scientific rigor. But as soon as we have better data on and understanding of other species, these will be included as well.

Other comments: Fishermen think in terms of money and not tonnes; we catch less and less valuable fish. If you want to catch herring, fine, but don't catch it where it competes with cod that has higher value for those of us who want to catch high-value fish in order to make higher profits. Rational exploitation of target stocks should also be implemented by decision makers. If we believe in the explanation that cod is slim due to food shortage, there are some options open: we could reduce fishing mortality of sprat and herring in order to provide cod with more food, or we can reduce catches of cod to leave them to grow bigger. These management options might not be ok. for all fishermen, as some fishermen want to fish in certain areas.

Monika Stankiewicz ([HELCOM](#) Executive Secretary) gave a presentation of HELCOM's work with implementing the EA to reach GES of the Baltic Sea, showing how the BSAP is used to reach these goals by 2021. The goals and objectives are based on best available knowledge, expert judgment and through political agreements on reaching reference levels. She stressed that fish are an integral part of the Baltic Sea ecosystem and that offshore and coastal food webs are coupled and also influence other parts of the ecosystem. She gave examples of HELCOM groups working with fish and fisheries (e.g. HELCOM FISH-PRO expert network, BALTFIMPA, HELCOM SALAR and SALAR+. Cross-sectoral integration is needed and tools such as MSP can be used to bring together different stakeholders and interest groups. Another tool for ecosystem assessment is integrated assessments such as HELCOM HOLAS, where a Baltic Sea Impact Index was used in order to show anthropogenic pressures and their potential impacts on the Sea. HELCOM is the regional coordination platform for the MSFD with its HELCOM GEAR groups for the implementation of the EA. HELCOM continues to decide on indicators and targets for determining GES, later applying monitoring programmes. Ms. Stankiewicz and HELCOM warmly welcomed the BSRAC to take part in HELCOM activities as BSRAC expertise and opinions are highly relevant in HELCOM'S work.

Questions/comments: Q: How does HELCOM seek and answer advice from science? How/what are the baselines for BSAP? Mrs. Stankiewicz explained that models on the ecosystem (e.g. Nest-model from [BNI](#)) are quite advanced in comparison with many questions regarding costs and benefits, but there are projects (e.g. [BalticSTERN](#)) that try to answer some of these questions. She continued by saying that there are no decisions to

restore conditions to pre-human levels, but each indicator is set according to best available knowledge. With regards to BSAP levels for emissions of nitrogen and phosphorus, they are now revising the nutrient quotas, but will not lower their ambitions.

Other comments: Historically levels of cormorants were lower, and they were even seen as a tourist attraction, but present levels are too high and they are perceived to eat all the fish. Counting of cormorants in Poland was done during the work with the eel management plan (and a detailed number can be found in the plan). As a response by requests from local fishermen, the NMFRI will arrange a special seminar this year to address the cormorant issue. Experts and stakeholders are invited to try to figure out how to address the increasing problems with cormorants in Poland. Compared to the times of socialist rule we are now catching less fish – perhaps we can discuss to have higher levels of discharges and algal problems in some areas in order to have higher catches of fish.

Panel discussion with Isabella Lövin, MEP; Henrik Österblom, SRC; Michele Casini, SLU; Kim Kær Hansen, Danish Fishermen's Association; Stefan Neuenfeldt, DTU Aqua; Stuart Reeves, DG MARE; Christian Möllman, Univ. of Hamburg; Monica Stankiewicz, HELCOM

Summaries of statements and comments from the panel and general assembly

EA, EAM process and fisheries

* The Baltic Sea is exceptional in its simplicity in terms of ecology/ecosystem properties and forms a perfect example for implementing EAM. Due to the Baltic Sea's special characteristics, it is wise to apply harvest control rules (maximum increase of fishing mortality between years for cod is set to +/-15%). MSFD and CFP should include EA, but also cohere with other policies including regionalisation. Objectives are clearly defined, but sometimes the goals are not so easy to understand for scientists.

* What is the desirable state of the Baltic Sea? It's the right question put to the wrong people; it shouldn't be the scientists who should decide the state of the Baltic Sea, but rather other stakeholders. Fish plays an important role in the ecosystem, but also in the lives of fishermen and people around the sea - something that should be taken into consideration with regard to political decisions. There is a need for abundant, resilient stocks that can contribute to GES in times of climate change and under other threats to the sea. Political choices have already been made, and scientists should present viable scenarios within the framework already decided upon by decision makers.

* The fishermen are guardians of the ecosystems and also want GES, but it is difficult for them to see what the future will bring in terms of e.g. management plans. The problem of EA for fishermen is partly that it was discussed when the stocks had already collapsed. The EA also includes how the environment supports fisheries and a discussion on what the EA can contribute to fishermen is often forgotten. It is therefore important to discuss multi-species management, but perhaps do it in another way to make fishermen understand the gains and to include them in decision-making. It is also important to accept that this is a learning curve – there are different opinions also including those of fishermen.

* There were some discussions regarding ICES numbers for e.g. cod and its natural mortality. Some people argued that this was a recipe for disaster and would lead to failure to meet the binding requirements of the MSFD. ICES clarified that it has not made any proposals for increasing fishing mortality, but had rather used numbers to show the dilemmas and to start a dialogue.

Cod and fishmeal

* There were some discussions regarding fishing for direct human consumption vs. fish being converted into fishmeal and used in aquaculture. Some argued that fishing for human consumption should be given priority (and that small-scale fishery is preferable compared to large scale/industrial fishing), while others argued that there is nothing wrong with sprat being used as fishmeal as it can produce other (wanted) species. It was also noted that sprat and herring are traditionally part of the Polish and Estonian diet. Differing views were put forward by participants on the use of sprat and herring for fishmeal as opposed to human consumption.

* Humans are naturally part of the ecosystem and are thus predators (it is not fishermen per se, but they represent the consumers) who exert quite high fishing pressure. Other parts of the ecosystem (including species such as seals and birds) are also important and rely on fish. As these species are not included in the models, citizens can however not state that they would perhaps prefer a high abundance of seals rather than cod/sprat.

Concluding remarks:

We can conclude that the objectives of our actions are clear and agreed in terms of GES. But we have a problem with regard to trade-offs and how to satisfy all users, as they have different objectives and priorities. Thus dialogue is absolutely essential! We must pursue and push dialogue and make EA understandable for fishermen, both in terms of profits and dangers. This road should be taken step by step with the best available knowledge. We have already done a lot of the work needed (e.g. multi-species approach); the remaining work is thus a stepwise approach and not a giant leap. As all activities on land and by other

sectors are important and influence the sea and its fish stocks, it is important that the BSRAC engages in this process, using tools such as the MSP.

Day 2: The legal frameworks, policy development and scientific input to policy making

Dr Stuart Reeves ([DG Mare](#)) presented the Commission's plans for multispecies multiannual plans and EA for Baltic fisheries. He explained that the reformed CFP must ensure that fishing and aquaculture provide long-term sustainable environmental, economic and social conditions by applying the precautionary approach, aiming to ensure that stocks are harvested so that MSY can be fulfilled, i.e. going towards MSY approach by 2015 and by implementing EAFM. Some measures have already been taken, e.g. protecting sensitive habitats and species, considering food-web interactions. As objectives cannot always be achieved within a single year, there's a need for longer-term planning. The plans also offer stability to the industry by limiting annual changes in fishing opportunities, and by limiting scope for political influence on TACs, and are thus more effective as a conservation measure. Long-term management plans, including multiple stocks, are well supported and are part of the process to reform the CFP. Several of the MSFD GES descriptors (1,2,4) also have importance for fisheries, but are, in comparison with the CFP where the EU Commission is responsible, the responsibility of the individual MS.

There are several management plans. In the Baltic Sea the cod plan has been in place since 2008, with harvest rules to set TACs and effort restrictions. A plan for herring and sprat was being prepared. There is a new decision to make a multispecies plan covering cod, herring and sprat stocks, as there are strong interactions between the species. These plans need impact assessment and therefore scientists and stakeholders, including the BSRAC, were invited to come with input. After consultations with stakeholders a decision was made to develop an adaptive management approach towards a multi-species plan for the Baltic.

Questions/comments: Despite the Baltic Sea seemingly being a simple ecosystem, there is still not enough research and knowledge about all food web interactions; including within-species interactions (e.g. cod cannibalism), which will have large impacts on MSY. Research is needed on cod cannibalism as this can affect the MSY target. So far, management plans have been a piece of legislation, but proper implementation needs more – including governance. It is still not resolved how the management plans fit with MSFD, and the prioritisation between the European Parliament, MS and the EU COM is unclear.

Dr. Poul Degnbol (ICES) started his presentation by saying that he disagrees with the notion experienced during the seminar that objectives are clear and that scientist should just do their job. There is an illusion of a clear division of labour, where policy defines objectives and science informs on relevant facts so that rational choices are made. Objectives are never clear in scientific terms, and trade-offs pop up all over the place. So how do we deal with uncertainty? From his point of view this is both a scientific and a policy issue!

Several policies have unclear objectives; the MSFD descriptors do not mention humans and their impacts on the environment. One example is the descriptor on food webs where it is stated that they should occur at “normal abundance and diversity” - but the system is dynamic and not stable, so what do we mean by “normal”? And the CFP should ensure sustainability (economic, social and environmental), but what is the balance? Integrated management implies multiple policy choices, as there is need to balance interests between and within sectors and of balancing multiple dimensions of GES. So we need discussions and dialogue on these descriptors within and among sectors and including all interests, based on explorations of options on the basis of “what if” questions. The role of science is to help answer “what if” questions and then leave the rest to stakeholders and decision makers. However, we need to keep in mind that “complete” knowledge does not exist. Science will always be a simplification, lacking knowledge on some processes, but we should always work based on best available knowledge to inform policy decisions – even if evidence is incomplete or unpalatable. We should thus incorporate knowledge that we have; e.g. system knowledge in single stock assessments, including multispecies interactions where we have data and move towards integrated assessments.

The key is a process: to explore options through dialogue between policy makers and stakeholders informed by scenarios (from “what if” questions) to identify objectives.

Questions/comments:

Q: Reference points for GES were mentioned. Is it possible to identify targets for GES beyond MSY? Regarding the role of science in the science-policy interface: what science do we refer to? Natural, social or trans-disciplinary? This is relevant for the whole issue, not least when discussing risks, which is a classical social scientific field. Why are social sciences ignored in ICES when all sciences should be involved? Dr Degnbol’s response to the first question was that that is the solution to this discussion. Understanding cod cannibalism is part of this, and the need to have a good age range, but also influencing the reference points and multispecies MSY. MSY in tonnes only is not good, and should be abandoned as an upper limit. If older cod in the Baltic Sea (according to GES) are wanted, we need other reference points. He continued by saying that he hoped that ICES is getting out of the black box by inviting stakeholders and making the work transparent. Social and economic sciences are needed. There is often the misunderstanding that including those sciences directly involves decision making/makers. But this is a misunderstanding (also seen in ICES, where the ICES Council advises us to base advice/recommendations on

natural sciences only); integration between all sciences is needed!

Other comments: Before joining the EU, Poland's understanding was that the Baltic Sea was a source of protein. The management plan to increase eastern cod stock has been successful, but what is happening now? The first task is to provide fish for human consumption, but it is unclear who is ensuring that this is fulfilled. There are also problems for small-scale fisheries with regard to an ageing workforce; soon there will be no more small-scale fishermen left in Finland and some of the other countries. The panel commented that small-scale fisheries are part of the CFP, but so far this cornerstone is only at the corner and there is nothing concrete on how to support it, how it should be regulated or how the EU's Fisheries Fund can help support this sector.

John Cotter (FishWorld Science) presented how ecological risk assessments for fisheries (ERAF) can be conducted, and by means of which one can: identify effects of activities, prioritize problems for action, weigh ecological risks against social and economic risks, keep watch for new situations and new risks, and finally move towards certification or ecosystem management.

The benefits of performing an ERAF are that it is: inclusive of all skills, looks at the whole ecosystem, allows a balance between ecological and socio-economic goals, brings in all available knowledge, regulates fishing (effort) according to the most sensitive indicator (not necessarily the species in questions, but might be some other component of the ecosystem) and may finally improve consumer acceptance of fish products.

Questions/comments: Q: This is a very subjective process, so the results can differ depending on who is part of the process. How long does this process take? Mr Cotter responded by explaining that although it is possible that results differ, you need a broad range of experts on the steering committee to be sure to include all aspects, otherwise it will be discarded when published. How long it takes naturally depends on the extent, but it can be done in a year, and the cost is relatively low, especially if the expertise and knowledge already exist and can be utilised.

Panel discussion: Stuart Reeves, DG Mare; Paul Dengbol, ICES; Bengt Larsson, SYEF (small-scale fisheries); Rainer Froese, Helmholtz-Centre for Ocean Research (GEOMAR); Antony Knights, University of Liverpool (ODEMM); Monika Stankiewicz, HELCOM; Pehr Eriksson, Swedish Fisherman's Federation.

Summaries of statements and comments from the panel and general assembly

* The panel discussed whether a good cod stock is the key for a successful EA, and concluded that reaching a sustainable spawning stock must be the goal, with resulting ecological and economic returns. Stock fluctuations depend on age structure, so fishing does influence the stocks! Low F (below F_{MSY}) is an investment for the future, not lost profit! This should be discussed and taken into account in management plans and policies. Comments were also raised that there is currently an opportunity to develop something new; for the sector to take part in collecting data, as at the moment we find less fish compared to what scientists claim exist (compared to before when we said there was lots of fish and the scientists disagreed).

Top-down decision making

* The panel and audience commented that fisheries was the only sector where decision-makers tell the sector (i.e. fishermen) how to do their job. The focus should be on results-based management and the end result, not how to get there: that should be left to the fishermen. They have the hands-on knowledge. Let society define the boundaries and the fishermen to meet the objectives set. The Baltic Sea should naturally be managed in the best way possible, but fishing should be encouraged (especially in younger generations) as we are presently losing fishermen.

Role of the BSRAC

* The fisheries sector was applauded for showing that they understand the EA and its importance, and the panel stressed the importance of the BSRAC in contributing to the EA process to reach the goals of e.g. BSAP and MSFD, urging the BSRAC to also get involved in discussions on MSP. It was however discussed that there is no clear leader to take the responsibility to start the necessary discussions and dialogue, and it is still unclear if this should be the responsibility of the government, RACs, NGOs or the sectors. It was proposed that the BSRAC join some of the HELCOM groups, and that the BALTFISH group and HELCOM invite stakeholders to start these discussions, as well as prepare a background document with different scenarios to facilitate this meeting and process.

Reine J. Johansson (BSRAC ExCom Chair) concluded by thanking all the speakers and participants, ending the BSRAC seminar by saying that he was unsure that we all draw the same conclusions after these two days, but that he would develop this thought further at some other meeting. The Baltic was a good place to start, but perhaps it will be agreed that it is not such a simple model after all.

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The BSRAC would very much like to thank the National Marine Fisheries Research Institute and in particular the Director, Dr. Tomasz B. Linkowski, for kindly making us welcome at the Institute and for letting us make use of their meeting room and facilities.

All the presentations from the Seminar are here:

http://www.bsrac.org/mod_inc/?p=itemModule&id=1860&kind=4&pageId=1106



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Brussels, 25/09/12

Dear all,

I would like to thank you for your very kind and thoughtful invitation to your seminar. As a member of the fisheries committee in the European Parliament I am in strong support of the protection of our ecosystem and the vital role it plays not only on our environment but also on our livelihood.

It is vital that we continue to research and implement ways of maintaining and restoring ecosystems as to continuing utilizing the fruits which they provide. The Baltic Sea is one such area that needs our specific attention.

Once again I thank you for your invitation and I commend you for your efforts and wish your seminar and continued work the greatest success.

Sincerely,

Jarosław Wałęsa

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