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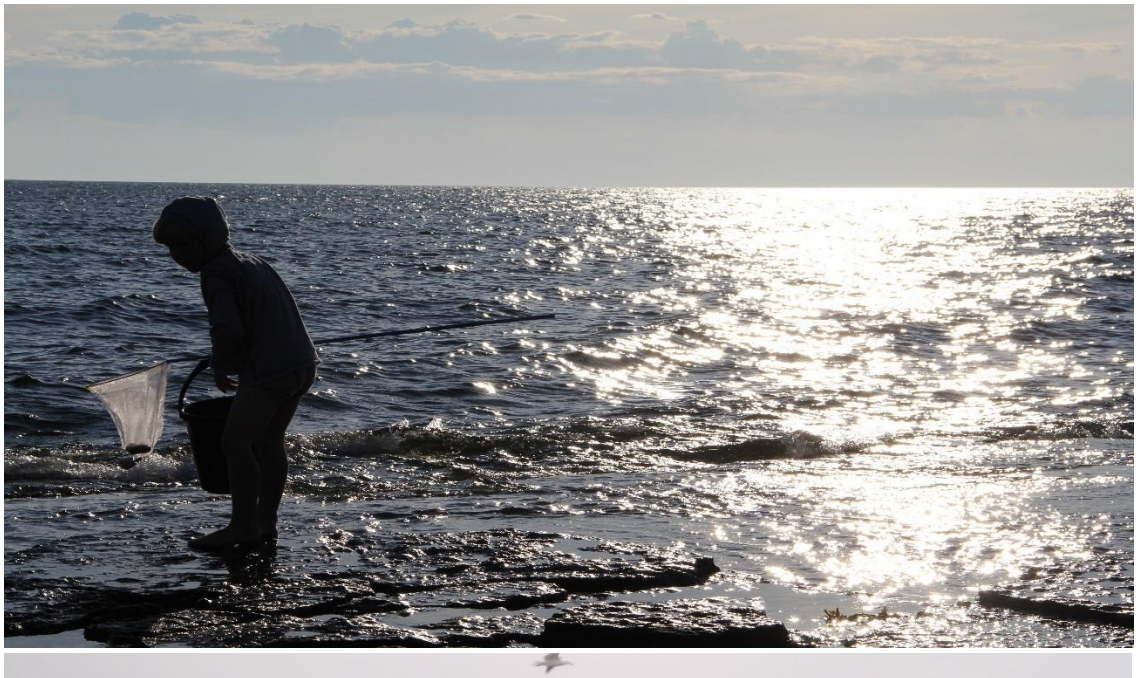
Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Faculty of Natural Resources and Agricultural Sciences

2016-07-22

Evaluation of SLU´s environmental monitoring and assessment programme Coastal and Sea Areas



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1. Background

1.1. About the evaluation

As part of the quality development of the environmental monitoring and assessment (EMA) at SLU, the programme Coastal and Sea Areas (CSA) was evaluated in spring 2016 on behalf of the Dean of the Faculty of Natural Resources and Agricultural Sciences. The evaluation group consisted of Phil Levin, NOAA Fisheries, Seattle, USA, Cecilia Lindblad, Environmental Protection Agency, Richard Johnson, acting vice-dean in charge of EMA, and Marnie Hancke, research advisor. The assignment is described in attachment 5.1.

The evaluation group supports the contents of the entire report, with Phil Levin focusing on the scientific content and quality of the EMA programme, Cecilia Lindblad focusing on stakeholders' perspectives and interests, and Richard Johnson and Marnie Hancke focusing on the internal organisation of EMA and collaboration with other EMA programmes coordinated by the faculty.

1.2. About SLU's environmental monitoring and assessment

In addition to research and education the Government has charged SLU with the task of conducting environmental monitoring and assessment. SLU monitors the country's forests, agricultural landscapes, lakes, watercourses and species in order to analyse environmental trends. Consequently, the university is a key player in interpreting and understanding changes in terrestrial and aquatic ecosystems related to land use and a warmer climate. SLU has chosen to organise its environmental monitoring and assessment into 10 programmes (see fig 1), each of which relates to specific Swedish environmental objectives.

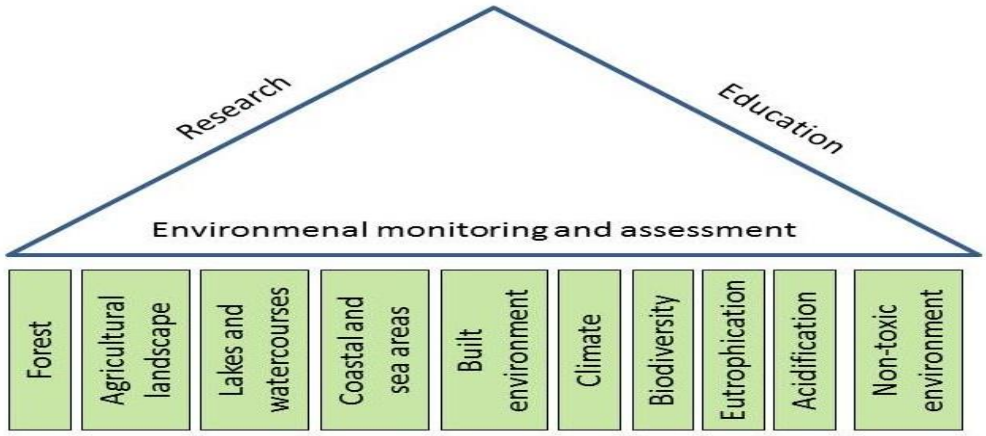

Figure 1. A schematic sketch of SLU's organisation combining research, education and environmental monitoring and assessment and the programmes within EMA.

It is SLU's ambition to collate all projects dealing with environmental monitoring and assessment in the relevant programme mentioned above, irrespective of financing. Each programme is organised by a coordinator, while, due to their size and scope, the programmes forest, agricultural landscape, lakes and watercourses, coastal and sea areas, eutrophication and non-toxic environment also have an assistant coordinator. Each of the programmes is organized around a specific set of objectives.

1.3. About the programme Coastal and Sea areas

The programme is intended to provide an overview of the environmental status of coastal and marine ecosystems in Swedish waters with a focus on fish and shellfish, and to support development toward national management goals in this field. The programme has a strong international dimension and includes more than 60 projects and activities linked to Sweden's environmental commitments within the legislative acts of the EU-commission (Common Fisheries Policy, Marine Strategy Framework Directive (MSFD), Water Framework Directive

(WFD)) and the regional seas conventions of OSPAR (Oslo-Paris convention) and HELCOM (Helsinki commission).

The programme CSA is economically the second largest EMA programme coordinated by the Faculty of Natural Resources and Agricultural Sciences with an annual turnover of 107 mnkr in 2015. External funding comprises 95% of the total economic turnover and has been lying constantly over 90% for the years 2012-2015. The majority of external funding comes from the Swedish Agency of Water Management (SwAM). The programme received a three-plus-three year agreement with SwAM in 2015 securing activities and projects.

2. Conducting the evaluation

The evaluation group has followed the guidelines given in the document 'Utvärderingsdirektivet' (attachment 5.1). The self-evaluation (attachment 5.2) authored by the programme's coordinator and project leaders within the programme forms the basis for the evaluation report.

The evaluation has been conducted by interviewing persons deemed to have important roles within the programme, such as the programme coordinator and project leaders, or have key positions at SLU. In addition, persons at collaborating authorities such as the Swedish Environmental Protection Agency, the Swedish Agency for Marine and Water Management (SwAM), and the County government Uppsala have been contacted and interviewed concerning their opinion regarding how the programme fulfils the authority's/organisation's needs for decision support. Attachment 5.3 gives an overview of the persons interviewed as well as the questions. Attachment 5.4 lists the grades and assessment criteria that have been used.

3. Results of the evaluation

3.1 Boundaries, structure and programme implementations

The programme Coastal and Sea areas was established in 2012, after the section for research and development of the Swedish Board for Fisheries was transferred to SLU. This new marine profile of SLU required some adjustments in relation to already existing EMA programmes, especially lakes and watercourses and biodiversity. With the CSA programme focusing on marine fish and shellfish, responsibilities for marine issues were moved from the biodiversity programme. Species migrating between freshwater and saltwater are still handled within the lakes and watercourses programme. Thus, collaboration between these three programmes comes naturally.

Given the relatively recent formation of the programme, the organisation and structure serve the overall aim of providing an overview of the environmental status of coastal and marine ecosystems in Swedish waters well.

The outer boundaries of the programme are obvious, and the evaluation group does not see a need to clarify its contents towards other programmes. However, it was mentioned by the programme coordinators themselves that writing the self-assessment raised the awareness of the boundaries

between the programme and the department itself. We think that the programme would become more visible SLU internally and towards stakeholders if it could become more detached from the department of aquatic resources and evolve into a cross-departmental programme.

The programme focuses on monitoring methods and their refinement and development. Internal funding is used for "higher-risk" projects and we encourage this as this could lead to innovation and new research projects. A great potential lies in collaboration with other departments at SLU that conduct monitoring for example within the area of e-DNA and we encourage the programme coordinators to use this potential in a better way.

We think that the choice of coordinators being placed at different localities, both in Öregrund and Lysekil, is a good approach to cover different systems (the Baltic Sea and the North Sea) at the same time as it is challenging. However, the entire department has a tradition of collaboration and communicating over a distance and we notice that geographic distance is no hinder for utilizing the entire competence of the department of aquatic resources as well as other departments of SLU.

3.2 Quality of reports and scientific publications

The primary scientific deliverables from this program are peer-reviewed publications, reports, teaching, and mentoring graduate students.

Publications:

From 2012 through 2015 the program published 117 papers in peer reviewed scientific journals. The author lists are diverse with numerous first authors and many co-authors. This speaks positively to the depth and breadth of the program. The majority of the papers are published in disciplinary journals (e.g. Marine Policy, ICES Journal of Marine Science, Fisheries Research, etc.) with impact factors ranging from 2-4. In addition, there are a number of papers in more general journals that attract a broader readership with higher impact factors (e.g., Conservation Letters, Ecology, PNAS, Ecological Applications, Proceedings of the Royal Society, etc.). This level of productivity is very good, especially considering the main thrust of the program is EMA work, rather than pure research. However, it is somewhat difficult to fully evaluate the level of productivity of the program because the number of staff actually engaged in the program is somewhat cryptic. Rating for this part of the program is 4.5 / 5.

Reports:

From 2012-2015 >350 reports were produced. The vast majority of these appear to be mandatory reporting from working groups and other projects or directly to management. Many of these are difficult for me to comment on because they are in Swedish. Nonetheless, it is clear the program has an active and leading role within ICES, HELCOM and OSPAR. And, authorship on the reports includes cross-fertilization with many external authors and institutes. While the level of work on reports is admirable, one wonders if the very high numbers of reports (about an average10 per month during the reporting period) detracts from other activities. Rating 5 / 5.

Education:

Nine Msc and two PhD theses were produced during the evaluation period. Topics covered ranged from social science (e.g., Sjölander) to fish biology (e.g. Blass). Some appear more focused on EMA than others, but all are clearly important topics, directly or indirectly, to fisheries management. The connection of the program to education is clearly on the rise. Plans to create new courses at SLU should further strengthen the connections between the program and education. There are opportunities for growth in this area of the program, and it is clear that steps are being made in this direction. Rating 4 / 5.

3.3 Collaboration with external stakeholders

Note: this part is a translation from Swedish. The original text can be found in attachment 5.5.

The CSA programme seems generally to be well known among the surveyed purchasers, although several of the people questioned were not aware that the name of the programme is "Coastal and sea areas". However, "SLU Aqua" is well known. This demonstrates the need to clarify the functions of the Department of Aquatic Resources (SLU Aqua) and the EMA programme *Coastal and sea areas* respectively. It should also be a signal to spread information on the programme initiative to a wider group within the relevant organisations and authorities, i.e. even to people not directly involved in orders and contracting.

The people who are well aware of the programme feel that CSA has a clear focus that can provide support for work on the environmental objectives, above all "A balanced marine environment" and "Zero eutrophication". The programme specifically contributes data for fish management through sampling that describes conditions and trends. This is in line with the needs of the dominant customer, the Swedish Agency for Marine and Water Management (SwAM). However, the needs of smaller clients, such as county councils, municipalities and fish conservation area associations can also be met by the content of the programme.

Those involved in SwAM's areas of responsibility that cover national and regional environmental monitoring and data collection from the coast and sea are particularly positive about the direction of the programme. The programme is especially important for those working on fisheries management, where extensive experience, consistent sampling and historic data going back to the era of the National Board of Fisheries (Fiskeriverket) are all very important. The programme's active expert role in international working groups such as OSPAR and HELCOM, but in particular within ICES, provides important support for management activities, but it can be further reinforced together with SwAM.

To the question of whether there are other providers that could be exploited in the same way, the answer is that the Department of Aquatic Resources is the provider that can currently offer the major elements of the services in the programme. The department is also currently the only provider of biological data collection within DCF (Data Collection Framework), as these elements are governed by ordinances and are carried out in accordance with Sweden's national programme for data collection, which is reviewed and approved by the commission.

When it comes to data collection as the basis for fisheries management, there is significant

expertise within the Department of Aquatic Resources, as a result, in part, of the expertise accumulated during the period of what was then the National Board of Fisheries. There is expertise in analysis of other parameters that are used by the authorities at other colleges/universities. However, one respondent felt that it might be simpler and more effective to ask consultancy companies to carry out shorter special assignments rather than the Department of Aquatic Resources, as there is a risk that university departments do not have the same requirements for efficiency and maintaining deadlines as consultants. It is important that the department is clearer about its role as the contractor in relation to the scientific profiling. Certain clients were careful to point out that the activities should not be too research-focused and that the design must follow the specification of the intended deliverables. However, the purchasers pointed out that it is positive if the results of assignments can also contribute to advances in research issues and form the basis for academic articles.

When it comes to the economic aspect, discussions are constantly ongoing between clients and providers regarding the costs of assignments related to the budgets of authorities. Cost levels linked to implementation, such as overhead costs, can always be questioned. SwAM's orders placed with the Department of Aquatic Resources are very comprehensive and are based on good integration between the activities of the department and the needs of the agency. Due to the historic link with what was then the National Board of Fisheries, there is another tradition that suggests that SwAM will continue to order from the Department of Aquatic Resources, even if costs increase somewhat. However, this may result in SwAM cutting down on other orders for aquatic resources if the budget remains at the same level. In the longer term, however, it may be forced to put external assignments out to competitive tender and choose a cheaper provider due to budget limitations.

Those elements conducted under DCF are governed by the current ordinance. In connection with the new ordinance coming into force from 2017, aspects of the content of the programme will be changed. Smaller clients will also be forced to reduce costs in the future if the current economic situation persists. When the time comes to renegotiate contracts, other alternative providers will also be examined. However, there is clearly a huge benefit in continuity, and it would be desirable to try to retain the same provider.

The strength of the programme, above all, is the long-term relationship between administrators and knowledge gatherers that was established during the time of the National Board of Fisheries. This mainly concerns the area of fish management, but development is now also apparent elsewhere, forming the basis for environmental management and marine planning.

The programme's knowledge of fish and shellfish, and the management of these, is a cornerstone of the good cooperation between SwAM and the Department of Aquatic Resources. The department also provides high-quality data to end users. Data accessibility is good in the form of databases and result reports that are well written. As the requirements of fish management change with time, it is important to maintain close contact with the research in order to quality-assure development. A local purchaser points out the importance of the link to universities, which guarantees consistent quality in terms of sampling and analysis.

The geographical proximity to the regional SLU offices that carry out sampling is highly valued.

This creates simpler cooperation and more effective exchange of expertise. There is also a very positive view of the flexibility in contracts because the ability to supplement the design of inspection programmes makes it possible to capture environmental changes in the sampling area. The relationship between researchers and exploiters, e.g. professional and recreational anglers, is well developed and of huge value for being able to implement management proposals.

As the programme is focused on fish, shellfish and fishing industry and its management in coastal and sea areas, there is, to some extent, a limit when it comes to developing ecosystem-based management. In order for the programme to be able to support work on the environmental objectives of "A balanced marine environment" and "Zero eutrophication", a broader approach is required that includes more of the ecosystem's components. There is currently no accumulated knowledge of all the aspects of the ecosystems and the environment. If the programme is to be developed, knowledge of the entire ecosystem needs to be more integrated in order to be able to carry out integrated analyses.

In general, comprehensive knowledge of the ecosystems cannot be centred within one group or a single programme at a reasonable cost, but the view of the ecosystems needs to be broadened to include at least the most important interactions for the survival of the ecosystems and how sustainable exploitation can be pursued.

There is a lack of in-depth analyses based on existing data from the monitoring programmes. As the Coastal and sea areas programme aims to provide a complete picture of conditions and trends in the Baltic Sea and the North Sea, it is important that valuable long-term data sets are fully exploited, in combination with other information, and that ecosystem-based models and future scenarios are developed. This would, for instance, increase the scope for achieving clarity in the cause-and-effect link for the deterioration in health of coastal fish.

The annual fact sheets published for various areas, such as fish monitoring within the coordinated national and regional monitoring of coastal fish, are comprehensive, but they need to be developed into reports and expanded with more analysis and discussion of results. A short fact sheet that summarises the most important conclusions can be produced as information for the wider general public.

In order to be able to develop ecosystem-based management, the programme needs stronger integration between the natural, social and economic sciences, e.g. when assessing ecosystem services or other types of environmental economic evaluation. This does not mean that the same provider must carry out all parts. However, with increased cooperation with other universities and research centres, the Department of Aquatic Resources can make its expertise available in a broader context and so develop ecosystem-based management.

With regard to future development of the programme, it is a need for a stronger integration between environmental and fish management, where ecosystem perspectives, e.g. in the form of ecosystem-based fish management, need to be formalised. This places great demands on the development of knowledge on the structure, functions and dynamics of the ecosystems, as well as how these are affected by exploitation and fisheries and environmental management. A link is also required to data on the social and economic aspects of management. Consideration also needs

to be taken of monitoring requirements from the Marine Strategy Framework Directive, particularly within the descriptors of food webs and marine waste.

Development within data collection (DCF) will follow the new ordinance requirements that will be issued once the audit is complete. It should also be pointed out that it is desirable to streamline and broaden the knowledge transfer/knowledge support between the *Coastal and sea* areas programme and SwAM by organising, for instance, theme days to take up, highlight and discuss issues.

3.4 Internal organisation and collaboration

The EMA programme Coastal and Sea Areas is one of six environmental assessment and monitoring programmes located at the faculty of Natural Resources and Agricultural Sciences. The programme's coordinator is situated at the Department of Aquatic Resources, Institute of Freshwater Research in Öregrund, the programme's deputy coordinator is situated at the Institute of Marine Research in Lysekil.

The exchange of information between the faculty and programme coordinators is mainly through the EMA board meetings, where programme coordinators are given the opportunity to participate. As a forum for information and dialogue these meetings are highly appreciated. Communication to higher levels within SLU occurs via the chair of the EMA board, representing the NJ-faculty in the SLU EMA council. Moreover, the EMA council plays a vital role in linking the different faculties.

According to the self-evaluation collaboration with the EMA programmes "biodiversity" and "lakes and watercourses" is well established. Collaboration with the biodiversity programme is partly due to historical reasons, as EMA projects concerning the coast and sea were tied to the biodiversity programme. With the establishment of the Department of Aquatic Resources in 2011 the majority of coast and sea-projects were moved but some projects linking sea and land are still placed within the biodiversity programme. People working on marine species at the Swedish Species Information Centre naturally have contact with the CSA programme. The work on alien/invasive species has been pointed out as a very successful collaboration between the biodiversity- and CSA-programmes.

Collaboration with the programme lakes and watercourses comes naturally when monitoring and studying anadromous fish species. However, to date there are no projects linking these two programmes together, collaboration is mainly dependent on individual researchers moving between them.

According to the interviewed programme coordinators, the CSA programme would gain from broadening its scope favouring collaboration with other SLU departments working with water related issues. It was also mentioned that there is a need for the programme to become more distinct both for external users and SLU itself, in relation to the other work conducted at the department. Within the department, a need for continuous work regarding the role of the coordinator was identified.

Information about and from the CSA programme ranged between grades 2 to 5, with a mean of 3,6 (1= not satisfied with the information exchange, 5= fully satisfied). There is a wish for better communication of highlights from the programme.

3.5 Objectives

SLU has developed a detailed goal structure for all its activities as well as for EMA. In this evaluation we only discuss the general goals for EMA and the specific goals of the CSA programme.

The general goals for EMA at SLU are:

1) There will be a strong connection between EMA and other missions of SLU;
2) EMA will be a European leader and contribute to international progress in scientifically based assessments;
3) Delivery of decision support that allows the exploitation of resources to be weighed against the environmental consequences of that exploitation.

The stated goal of the CSA programme is to provide an overview of the environmental status of coastal and marine ecosystems in Swedish waters with a focus on fish and shellfish, and to support development of national management goals on this topic.

This general aim has been operationalized by

- Undertaking extensive environmental monitoring in marine and coastal waters
- Conducting assessments and providing biology advice to national and international managers
- Employing an ecosystem approach to management of fisheries systems, including the development of ecosystem and human-impact indicators

The CSA programme has undertaken a number of activities in pursuit of their objectives. For example, the program conducts international ground fish, pelagic fish surveys, a Nephrops survey, and they monitor marine litter. They also sample fishery catches, discards and landings and monitor fish and benthos associated with nuclear power plants. SLU is national data host for coastal fish monitoring data, and the data from surveys and catch statistics are submitted to international management agencies. Assessments of stock status are provided to national, regional, and international management bodies. Information is also provided to support the objectives of the EU Marine Strategy Framework Directive.

It is evident that the CSA programme has been a strong partner in monitoring and assessment of the marine environment. The programme is the only principal actor in Sweden with respect to monitoring and assessment of offshore commercial fish and shellfish. Additionally, the programme is effective at achieving its objectives through strategic partnerships to other departments at SLU and through cooperation with other universities and management bodies outside of SLU and Sweden. The tight link to SwAM also ensures that program objectives are met.

The number of peer-reviewed scientific publications is high, and in total 11 graduate students have been working with CSA programme projects. The self-evaluation also describes participation in teaching at both undergraduate and advanced levels. Considering the very large proportion of the budget that comes from external sources (e.g., in 2015, external funding constituted about 95 % of the budget) this level of production in support of programmatic objectives is impressive.

Movement into the Ecosystem approach to management is good. The programme has been involved in a number of regional and international activities that have attempted to operationalize ecosystem approaches. To this end, the programme's efforts towards ecosystem indicators and indicators of human impact are important. However, the move to a more general ecosystem perspective is hampered by a monitoring focus on biological aspects of fisheries. Thus, there is room to improve how the programme tackles ecosystem aspects of fisheries management by broadening surveys to include non-fisheries species that are important to the ecosystem (e.g. zooplankton). Additionally, the ecosystem approach calls for rigorous attention to human dimensions of marine ecosystems. Thus, more attention to social and economic sciences would enhance and improve programme outputs.

3.6 Ideas for development

The CSA programme already provides valuable information to support marine natural resource management in Sweden and beyond. The work is rigorous, innovative and useful. Even so, there are a few areas where further development would enhance the information provided by the program.

1. The policy landscape of Sweden and Europe is complex, with many demands emerging from different interlinked EU directives. This institutional arena will only become increasingly intertwined and complex in the future. Thus, it is important that the programme establishes itself as a leader in the development of monitoring methods in marine and coastal ecosystem to support these directives. This includes monitoring that enables assessment of not only commercially important fish and shellfish, but also components of the marine ecosystem that support its functioning and productivity. This is necessary to support an ecosystem-based approach to management. Such scientifically-based ecosystem surveys and integrated ecosystem monitoring is essential for stock assessments, integrated ecosystem assessments and for the valuation of marine and coastal ecosystem services.
2. Monitoring data and assessment models are necessary but not sufficient to support ecosystem approaches. An important area of growth and development for the programme will be to enhance our understanding of biotic and abiotic interactions in marine and coastal ecosystems. This includes both new types of data (see above) but also development of ecosystem models. This could include strategic-planning models such qualitative network models, Ecopath with Ecosim or Atlantis, but also more tactical models such as MICE (models of intermediate complexity for ecosystem assessment). Development and prioritization of this capacity is critical for the programme to become a leader in management of marine and coastal natural resources.
3. Lethal sampling has been a cornerstone of ecological science for decades; however, such destructive sampling is not always necessary. Indeed, there is a need to reduce the use and killing of live organisms in science and environmental monitoring. We suggest the program develop more ethically sound and non-destructive monitoring and assessments

methods in marine waters. This could include the increased use of molecular methods for monitoring, usage of monitoring methods in which the surveyed animal is released after sampling, and development of citizen science.

4. Members of the CSA programme hold key positions in strategically important working and expert groups within HELCOM, STECF and ICES. Providing and planning for such leadership opportunities is a critical aspect of programmatic development. Continued growth and advances in this area will strengthen and improve the role of SLU in influencing decisions and strategies of the EU commission and other governmental bodies.
5. The CSA programme is presently centred on biological components of the ecosystem. However, across Europe and the globe, there is an increasing demand to integrate biological with economic and social processes. Currently, some social science expertise can be found external of the program and is helping fill this need. However, going forward there is a strong need to develop the economic, social and cultural sciences of the program. Such development will allow rigorous studies on ecosystem services, but also should be broad enough to address the full breadth of social and cultural aspects of social-ecological systems. Progress in this area will allow the programme to effectively meet the complex demands of society and international directives and agreements. We recommend increased cooperation with other universities and/or research centres where the Department of aquatic resources can contribute with its expertise to a wider context and thus develop an ecosystem-based management.

4. Conclusions and recommendations

The evaluation group draws the following main conclusions regarding the Coastal and sea areas programme during the last three years:

- During the evaluation period the programme has emerged as a strong, internationally recognized group that provides long-term monitoring data and fisheries assessments.
- The EMA-focus is complemented well with a strong link to research. Thus, the group appears to serve management needs well while also continuing to advance the science upon which management is based.
- The scientific output of the group is strong. The numerous scientific papers are of high quality and cover a broad scope of topics. The numerous co-authored papers reflects a strong and effective collaborative working environment.
- The programme has focused largely on fish and shellfish, with much less emphasis on lower trophic level species or human dimensions of the system.
- The programme has generated an enormous amount of very valuable information, but efforts to synthesize this vast knowledge have not been prioritized.
- There has been an appropriate shift in ecosystem thinking, but development of needed data and analytical tools have lagged.
- The programme has strong scientific leadership, with clear scientific goals, a large national and international network and cooperation and participation in large national and international projects.

We make the following recommendations:

- The programme is instrumental for providing advice regarding the state of the marine environment as is very responsive to management. We recommend the programme

maintain this excellence while also becoming more proactive in terms of trying to foresee emerging knowledge needs and then adjusting monitoring and analysis to meet these future demands.

- Because emerging needs are diverse, we recommend the programme continue to engage in novel, international collaborations to meet these needs. For example, the collaborative efforts around the Integrated Ecosystem Assessment have been very successful and could be broadened.
- The leadership of the programme is strong, but the interviews suggested that the Coordinator has limited ability to assign work to staff. Thus, we recommend that consideration be given to making the Coordinator a section lead who can manage people and who can work with other leads to affect change.
- We recommend increased collaboration with other (relevant) departments at SLU.
- We also recommend a continued and potentially increased commitment to teaching and supervising MSc and PhD students.

5. Attachments

5.1 Assignment

(Parts of the instructions for the evaluation which are relevant for the evaluation group have been lift in).

Syftet med utvärderingen av SLU:s miljöanalysprogram är att få underlag för beslut om strategisk programutveckling, allokering av statsanslag och justering av programvisa mål.

Utgångspunkter för utvärderingen

- Den görs med utgångspunkt såväl från LSU:s allmänna mål för den fortlöpande miljöanalysen, som de programvisa mål som finns för varje miljöanalysprogram.
- Den beaktar hur programmet bidrar till arbetet med de nationella miljökvalitetsmålen, Sveriges internationella åtaganden enligt konventioner och EU-lagstiftning, samt sektorernas behov av beslutsunderlag för hållbart nyttjande av naturresurser.
- Den omfattar aspekter på arbetets kvalitet, nytta för avnämare, samt interna organisatoriska frågor.
- Den omfattar hela miljöanalysprogram, det vill säga såväl de delar som har statsanslag som de som finansieras med externa medel. Särskild vikt ska dock läggas vid de statsanslagsfinansierade delarna av programmet.
- Den beaktar lämplig rollfördelning mellan olika nationella utförare med utgångspunkt från inom vilka områden SLU:s forskning och miljöanalys har en stark kompetensbas.
- Den leder fram till betygssättning a programmets prestation, förslag om utvecklings- och nedprioriteringsområden, förslag om justerade programvisa mål, samt eventuella förslag om förändringar för att förbättra programmets effektivitet (inom de ramar som ges av SLU:s övergripande organisation av den fortlöpande miljöanalysen).
- Den ger underlag för bedömning av hur stora statsanslag som bör fördelas till programmet.

Redovisning av utvärderingen

- En kortfattad beskrivning av hur man genomfört utvärderingen.
- En betygssättning av programmet med tillhörande kortfattade beskrivande texter – för vart och ett av momenten:
  - programmets genomförande, kvalitetsarbete och leveranser i relation till SLU:s allmänna mål och de programspecifika målen,
  - samverkan med uppdragsgivare, avnämare av resultat, andra utförare, och internt inom SLU (bland annat samspelet miljöanalys – forskning respektive utbildning, samt
  - strategi och utvecklingsplaner
- Utvärderingsgruppens syn på programmets styrkor, svaghet och nisch i förhållande till andra utförare, nationellt och internationellt.
- Förslag om på vilket vis man anser att programmet behöver utvecklas.

5.2 Self-evaluation of the programme Coastal and Sea areas

Jens Olsson et al. 2015, SLU ID: SLUaqua.2016.5.4-46

5.3 Interviewed or consulted people and questions used in the interviews

5.3.1 List over interviewed persons conducted by Cecilia Lindblad

Interviewed persons:

Fredrik Ljunghager och Mats Svensson, direkt tillfrågade, Havs- och Vattenmyndigheten
Bertil Håkansson, Annna Hasslow, Karl Norling och Mårten Åström har bidragit med skriftliga svar på frågorna som sammanställts av Fredrik Ljunghager, Havs- och Vattenmyndigheten
Tomas Eriksson, Forsmarks Kraftgrupp
Ingrid Wärnstrand, Länsstyrelsen Uppsala Län
Ulrik Kautsky, SKB
Samtal och diskussion om Foma-programmet har förts med handläggare på Naturvårdsverket, Avdelningen för analys och forskning.

Intervjufrågor:

- Beskriv din ”karta” över programmet *kust och hav*: ditt nätverk och dina viktigaste kontakter. Hur stort är försurningsprogrammets utrymme i förhållande till de övriga aktörernas utrymme?
- Beskriv på vilket sätt du har nytta av SLU:s försurningsprogram i ditt arbete? Eventuellt utvidgning mot hur myndigheten/organisationen har nytta av programmet.
- Betygsätt de delar som nyttjas i din organisation på en skala 1-5 där 1 = inte viktigt alls, 5 = mycket viktigt.
- Motsvarar programmets inriktning dina behov av data/underlag/resultat/stöd?
- Tror du att programmet *kust och hav* bidrar till att nå det nationella miljökvalitetsmålet ’Hav i balans samt levande kust och skärgård’? ja/nej/vet inte. Om nej, vad saknas?
- Finns det andra utförare som erbjuder samma utbud/tjänster till högre kvalitet? / Hur är

kvaliteten på SLU:s tjänster jämfört med andra utförare av liknande tjänster.
- Ur din verksamhets perspektiv, vad är styrkorna med programmet
- Ur din verksamhets perspektiv, vad är svagheterna med programmet?
- Har du nytta av att programmet har nära kontakt med forskningen?
- Ur din verksamhets perspektiv, vilket utvecklingsbehov ser du för programmet Försurning i framtiden? Saknar ni något i programmets utbud/tjänster?
- Hur nöjd är du med (på en skala 1-5 där 1 = inte nöjd alls, 5 = mycket nöjd)
  -Dataleverans överlag
  -Datalevereras i tid
  -Data uppfyller ditt behov av kvalitet
  -Kontakter med personer inom programmet kust och hav

5.3.2 Interviews with project leaders and contact persons within the programme conducted by Phil Levin

Interviewed persons:

Anna Gårdmark, professor at the Department of Aquatic Resources
Lena Bergström, researcher at the Department of Aquatic Resources, programme coordinator until January 2015
Valerio Bartolino, researcher at the Department of Aquatic Resources, project leader

Interview questions:

- What role do you have in the programme?
- What is the impact of the programme?
- Has the programme been organised well?
- How do external assignments come in (via the programme/coordinator or through contact with individual researchers)?
- What changes should be made in the programme/How should the programme evolve?
- What aspects are relevant for the programme in the future?

5.3.3 Interviews with EMA programme coordinators conducted by Richard Johnson

Interviewed persons:

Mora Aronsson, coordinator programme biodiversity
Stina Drakare, coordinator programme lakes and watercourses

Interview questions:

- Vad känner du till om programmet kust och hav?
- Har programmet varit organiserat bra med tanke på att programmets inriktning ska bidra till att nå de svenska miljökvalitetsmålen, först och främst ”Hav i balans samt levande kust och skärgård”?
- Behöver inriktningen ändras eller anpassas?
- Programmet beskriver i sin självvärdering att den har kopplingar till miljöanalysprogrammet sjöar och vattendrag samt biologisk mångfald. Skulle du kunna

beskriva hur kopplingarna ser ut från ditt håll?
- Skulle det kunna finnas fler kopplingar som ökar det interna samarbetet?
- Beskriv nyttan för programmet sjöar och vattendrag/biologisk mångfald med kopplingen till kust och hav.
- Hur får du information om programmet kust och hav? Informationsflöden som rör programmet – beskriv dessa utifrån ditt perspektiv (din roll). Betygsätt på en skala 1-5, där 5 är mycket nöjd och 1 inte alls nöjd.
- Vad behövs för att höja betyget om ett steg?
- Finns det något negativt med programmet kust och hav?
- Vilka framtidsfrågor är relevant för programmet kust och hav?
- Något vi borde frågat om, som du tycker att vi missat?

5.3.4 Interviews with key persons conducted by Richard Johnson

Magnus Appelberg, Head of Department, Department of Aquatic Resources
Kevin Bishop, Pro-vice chancellor with responsibility for environmental monitoring and assessment
Torleif Härd, Faculty Dean, Natural Resources and Agricultural Sciences

Interview questions:

Programmet kust och hav kopplar huvudsakligen till det svenska miljökvalitetsmålet Hav i balans samt levande kust och skärgård. Programmet svarar även delvis mot miljömålen sjöar och vattendrag och biologisk mångfald.

- Vad känner du till om programmet kust och hav?
- Beskriv din roll i förhållande till programmet – hur ser ansvarsområden ut? Är ansvaret tydligt delegerat?
- Informationsflöden som rör programmet – beskriv dessa utifrån ditt perspektiv (din roll).
- Betygsätt på en skala 1-5, där 5 är mycket nöjd och 1 inte alls nöjd.
- Vad behövs för att höja betyget om ett steg?
- Ger informationsflöden nödvändiga underlag för din roll? Är informationen tillräcklig, är det något som saknas, eller borde se annorlunda ut?
- Vilken nytta ser du av att ha programmet vid institutionen/vid fakulteten/vid SLU?
- Något negativt att ha programmet vid institutionen/fakulteten/SLU (dvs. något som drar ner)?
- Finns det ett mervärde för institutionen/fakulteten/SLU genom att programmet kust och hav är involverat i foma/forskning/utbildning? Vari bestå mervärdet?
- Avkastning i balans med medel som tilldelas från fakulteten? (Nyttoeffekt >, <, = belastning?)
- Nytta om programmet tilldelas mera pengar från fakulteten?
- Ge din syn på uppdelningen foma/forskning. Finns det strukturella hinder som försvårar synergierna mellan foma och forskning?

- Vad känner du till om de data och resultat som produceras? Exv vilka data och hur de är tillgängliga.
- Görs reklam för programmets data inom institutionen/fakulteten/SLU?
- Något vi borde frågat om, som du tycker att vi missat?

5.4 Assessment criteria

In the evaluation the following grades and assessment criteria have been used.

Grade	Criteria		
	scientific	Collaboration/ strategy and development	fullfillment
5	Internationellt hög	Utmärkt	Mycket nöjd
4	Internationellt erkänd	Mycket bra	-
3	Måttlig	Bra	-
2	Otillräcklig/bristande	Otillräcklig/bristande	-
1	Dålig	Dålig	Inte alls nöjd

5.5 Original text in Swedish for paragraph 3.3 Collaboration with external stakeholders

Det fortlöpande miljöanalysprogrammet (Foma-programmet) tycks generellt vara välkänt hos tillfrågade avnämare, även om flera av de tillfrågade personerna inte kände till att namnet på programmet är kust och hav, men däremot är ”SLU Aqua” välkänt. Detta visar på behovet att tydliggöra funktionerna mellan Institutionen för akvatiska resurser, SLU Aqua och *kust och hav*-Foma-programmet. Det bör även vara en signal för att sprida information om program-satsningen till en bredare grupp inom berörda organisationer och myndigheter, det vill säga även till personer som inte direkt är involverade i beställningar och avtalsskrivningar.

De personer som är väl insatta i programmet, tycket att kust och hav har en tydlig inriktning som kan ge stöd till arbetet med miljömålen, framförallt ”Hav i balans” och ”Ingen övergödning”. Programmet bidrar specifikt med underlag till fiskeförvaltning genom provtagningar som beskriver tillstånd och trender. Detta stämmer väl med de behov som den dominerande beställaren, Havs- och Vatten myndighetens (HaV) har. Men även andra mindre uppdragsgivares behov som till exempel, Länsstyrelser, Kommuner och fiskevårdsområdesföreningar kan tillgodoses av programmets innehåll.

De personer som är involverade i HaV's ansvarsområde som omfattar nationell och regional miljöövervakning och datainsamling i kust och hav är speciellt positiva till programmets inriktning. Programmet är särskilt viktigt för de som arbetar med fiskeriförvaltningen, där lång erfarenhet, konsekvent provtagning och historiska data sedan Fiskeriverkets tid, har stor betydelse. Programmets aktiva expertroll i internationella arbetsgrupper som OSPAR och HELCOM, men speciellt inom ICES, ger viktigt stöd i förvaltningen men kan förstärkas ytterligare tillsammans med HaV.

På frågan om det finns andra utförare som skulle kunna nyttjas på samma sätt, är svaret att institutionen för akvatiska resurser är den utförare som i nuläget kan erbjuda de stora delarna av tjänsterna i programmet. Institutionen är i nuläget också den enda möjliga utföraren av den biologiska datainsamlingen inom DCF (Data Collection Framework), eftersom dessa delar är förordningsstyrda och utförs enligt Sveriges nationella program för datainsamling vilket är granskat och godkänt av Kommissionen.

När det gäller insamling av data som grund för fiskeriförvaltning finns en stor kompetens inom institutionen för akvatiska resurser, delvis beroende på det som byggdes upp under dåvarande Fiskeriverkets tid. På andra högskolor/universitet finns det kompetens inom analys av andra parametrar, som utnyttjas av myndigheterna. Dock fanns en svarande som ansåg att det kan vara enklare och mer effektivt att tillfråga konsultfirmor att utföra kortare special uppdrag än institutionen för akvatiska resurser, då det finns risk att universitetsinstitutioner inte har samma krav på effektivitet och tidshållning som konsulter. Det är viktigt att institutionen blir tydligare med rollen som uppdragstagare i relation till den vetenskapliga profileringen. Vissa uppdragsbeställare var noga med att poängtera att undersökningarna inte får blir för forskningsinriktade, utförandet måste följa specifikationen av vad som ska levereras. Däremot påpekade avnämarna att det är positivt om uppdragens resultat även kan bidra till framsteg i forskningsfrågor och bli underlag till vetenskapliga artiklar.

När det gäller den ekonomiska aspekten förs ständigt diskussioner mellan beställare och utförare avseende kostnader för uppdragen relaterat till myndighetens budgetramar. Kostnadsnivåer som är knutna till utförandet såsom OH-avgifter kan alltid ifrågasättas. HaVs beställningar till institutionen för akvatiska resurser är väldigt omfattande och bygger på en god integrering mellan institutionens verksamhet och förvaltningens behov. På grund av den historiska kopplingen till dåvarande Fiskeriverket finns ännu en tradition som talar för att HaV kommer att fortsätta beställa av institutionen för akvatiska resurser även om kostnaderna ökar något. Dock kan det innebära att HaV får skära ned på andra beställningar till akvatiska resurser om budgeten ligger kvar på samma nivå. Men på längre sikt kan det bli tvunget att konkurrensutsätta externa uppdrag och välja billigare utförare på grund av budgetbegränsningar.

De delar som görs under DCF styrs av nuvarande förordning. I samband med att den nya förordningen träder i kraft från och med 2017 kommer delar av innehållet i programmet att förändras. Mindre uppdragsgivare är även tvungna att minska kostnaderna i framtiden om samma ekonomiska situation gäller då som i dagsläget. När det blir aktuellt för omförhandling av avtal kommer även andra alternativa utförare att granskas. Men man ser en stor fördel med kontinuitet och det skulle vara önskvärt att försöka behålla samma utförare.

Styrkan med programmet är framförallt den långsiktiga relation mellan förvaltare och kunskapsinhämtare som etablerades redan under Fiskeriverkets tid. Detta gäller främst kopplingen till fiskförvaltning, men det håller nu på att utvecklas även till att vara underlag för miljöförvaltningen och havsplaneringen.

Programmets kunskaper om fisk, skaldjur och förvaltningen av dessa är den viktigaste grunden för det goda samarbetet mellan HaV och institutionen för akvatiska resurser. Institutionen levererar också data med hög kvalitet till slutanvändare. Datatillgängligheten är god i form av databaser och resultatrapporterna som levereras är välskrivna. Eftersom behoven hos fiskeförvaltningen ändras med tiden är det viktigt att ha nära kontakt med forskningen för att kvalitetssäkra utvecklingen. En lokal avnämare påpekar vikten av kopplingen till universitet, vilket garantera jämn kvalitet på provtagning och analys.

Den geografiska närheten till de regionala SLU kontoren som utför provtagningar, värderas högt. Detta skapar ett enklare samarbete och effektivare kompetensutbyte. Man upplever också som mycket positivt att det finns en flexibilitet i avtalen, genom att göra kompletteringar till kontrollprogrammens utförande är det möjligt att fånga miljöförändringar i provtagningsområdet. Även relationen mellan forskare och exploatörer, t.ex. yrkes- eller fritidsfiskare, är väl utvecklad och av stort värde för att kunna genomföra förvaltningsförslag.

Eftersom programmet är koncentrerat till fisk, skaldjur och fiskenäring och dess förvaltning i kust och hav, är det till viss del en begränsning när det gäller att utveckla en ekosystembaserad förvaltning. För att programmet ska kunna ge stöd till arbetet med miljömålen ”Hav i balans” och ”Ingen övergödning”, kan en bredning behövas som omfattar flera delar av ekosystemets komponenter. I dagsläget saknas samlad kunskap om alla delar av ekosystemen och miljön. Om programmet ska utvecklas behöver integreringen av kunskap om hela ekosystemet förstärkas för att kunna göra samlade analyser.

Generellt kan heltäckande kunskap om ekosystemen inte centreras inom en grupp eller ett enda program till rimliga kostnader, men synen på ekosystemen behöver breddas för att åtminstone inkludera de viktigaste interaktionerna för ekosystemens fortlevnad och hur en hållbar exploatering kan bedrivas.

Det finns en brist på fördjupade analyser baserat på befintliga data från övervakningsprogrammen. Eftersom kust och hav-programmet har som mål att ge helhetsbilden av tillstånd och trender i Östersjön och Västerhavet, är det viktigt att värdefulla långtids dataserier utnyttjas fullt ut, i kombination med annan information, och utvecklar ekosystembaserade modeller och framtidsscenarier. Det skulle till exempel öka möjligheten att få klarhet i orsakssambanden för den försämrade hälsan hos kustfisk.

De årliga faktabladen som publiceras för olika områden som provfiskas inom den samordnade nationella och regionala övervakningen av kustfisk är omfattande, men de skulle kunna utvecklas till rapporter och utökas med mer analys och resultatdiskussion. Ett kort faktablad som sammanfattar de viktigaste slutsatserna kan produceras som information för den bredare allmänheten.

För att kunna utveckla en ekosystembaserad förvaltning behöver programmet en starkare integrering mellan naturvetenskapliga, sociala och ekonomiska vetenskaper, t.ex. vid värdering av ekosystemtjänster eller annan typ av miljöekonomisk värdering. Detta innebär inte att det är samma utförare som måste utföra samtliga delar. Men med ett ökat samarbetet med andra universitet och forskningscentra, kan institutionen för akvatiska resurser ingå med sin expertkompetens i ett bredare sammanhang och på så sätt utveckla en ekosystembaserad förvaltning.

Vid frågan om programmets utvecklingsbehov, återkommer man till behovet av integrering mellan miljö- och fiskförvaltning där ekosystemperspektiv, t.ex. i form av ekosystembaserad fiskförvaltning, behöver formaliseras. Detta ställer stora krav på utvecklingen av kunskap om ekosystemens struktur, funktioner och dynamik och hur exploatering samt fiskeri- och miljöförvaltning påverkar dessa. Dessutom behövs koppling till underlag om sociala och ekonomiska aspekter på förvaltningen. Hänsyn behöver också tas till övervakningskrav från havsmiljödirektivet, speciellt inom deskriptorerna näringsväv och marint skräp.

Utvecklingen inom datainsamlingen (DCF) kommer följa de nya förordningskrav som kommer efter att revision är avslutad. Det påpekas även att man önskar effektivisera och bredda kunskapsöverföringen/kunskapsstödet mellan programmet Kust och Hav och HaV genom att organisera t ex tematiska dagar, då vissa frågor kan tas upp, belysas och diskuteras.

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Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Department of aquatic resources

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Self evaluation Coastal and Sea areas Foma-programme

Photo: Ann-Katrin Hallin

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Introduction

SLU's Foma-programmes (environmental monitoring and assessment programmes) are evaluated every fifth year. The evaluation of the programme ***Coastal and Sea areas*** concerns the period from 2012 (when the programme was founded) to 2015. The programme was formed to encompass the new marine profile of SLU, following the transfer of the section for research and development from the Swedish Board of Fisheries into the new Department of aquatic resources at SLU. The self-evaluation of the ***Coastal and Sea areas*** programme below is produced by Jens Olsson (coordinator) and Håkan Wennhage (co-coordinator), together with Jan Andersson, Magnus Appelberg, Andreas Bryhn, Maria Hansson, Joakim Hjelm, Lena Bergström, Mattias Sköld, Ulf Bergström and Daniel Vallentinsson.

Programme overview

The overall aim of the Foma-programme ***Coastal and Sea areas*** is to provide an overview of the environmental status of coastal and marine ecosystems in Swedish waters with a focus on fish and shellfish, and to support development toward national management goals in this field. The programme key focal areas are to develop and maintain interactions with research and education, a strong international perspective, as well as to develop and refine monitoring methods, assessments, produce syntheses and management advice for aquatic resources. In line with SLU standards, the programme is linked to one of Sweden's 16 environmental objectives, primarily "*A balanced marine environment, flourishing coastal areas and archipelagos"*, but also includes aspects of the objectives "*A rich diversity of plant and animal life"* and "*Zero eutrophication*". In the international perspective, the programme contributes to Sweden's environmental commitments within the legislative acts of the EU-commission (Common Fisheries Policy, Marine Strategy Framework Directive, MSDF, Water Framework Directive) and the regional seas conventions of OSPAR (Oslo-Paris convention) and HELCOM (Helsinki commission).

Coastal and Sea areas is dominated by the environmental monitoring and assessment work in marine and coastal waters as undertaken by the Department of aquatic resources (Institute of Marine research and

Institute of Coastal research). This work has traditionally focused on advice for fisheries management, monitoring programs and evaluation of coastal environmental impacts. As such, the programme includes everything from monitoring and databases to yearly assessments and biological advice to managers, both in a national and international context. More recently, as reflected in the aim of the programme, there is development to broaden the scope and an increased focus on supporting an ecosystem approach to (fisheries) management of marine systems, development of indicators to assess the status of marine ecosystem components, and to assess the effects of human impacts on the marine environment.

The main monitoring programmes within ***Coastal and Sea areas*** are the international ground fish surveys (IBTS, The International Bottom Trawl Survey, and BITS, Baltic International Trawl Survey), and pelagic fish surveys (BIAS, Baltic International Acoustic Survey) in the North Sea and the Baltic Sea. There is also the regional Nephrops UWTV survey, and monitoring of marine litter on the sea floor (using the IBTS and BITS platforms). The major national monitoring includes sampling programmes of the commercial fishery (catches, discards and landings), national integrated coastal fish monitoring, regional coastal fish monitoring in Skagerack, Kattegat and Baltic Sea, and the surveillance programmes for benthos and coastal fish associated to the nuclear power plants in Sweden. In addition to this, commercial VMS data is used to monitor and analyse fishing patterns in combination with logbook data from fishermen, and more recently to assess fishing impacts (e.g. on benthic systems from bottom trawling). For species defined as commercial by the EU, sampling is regulated by the DCF (Data Collection Framework).

The data collected is stored in databases, mainly within Fiskdata2 (trawl surveys and fishery dependent data) and KUL (coastal fish data, http://www.slu.se/sv/institutioner/akvatiska-resurser/databaser/kul/). SLU is national data host for coastal fish monitoring data, and the data from the offshore trawl surveys and catch statistics is regularly submitted to the ICES (International Council for Exploitation of the Seas) international databases DATRAS, FishFrame and InterCatch.

Analysis and assessments of the data collected is used for marine- and fisheries management, mainly within two legislative acts of the EU, the Common Fisheries Policy (CFP) and Marine Strategy Framework

Directive (MSFD), and within the regional seas conventions of HELCOM for the Baltic Sea and OSPAR for the North Sea. Assessments based on coastal fish monitoring are also used to provide advice to local county administrative boards and the private industry. The data collected and analysed within the DCF is primarily used within ICES to produce status assessments and advice for annual catch quotas, whereas data from coastal fish monitoring serves as the basis for national and local management plans of both fisheries- and environmental management.

During recent years, the data and products produced within ***Coastal and Sea areas*** have increasingly been used to develop indicators for the implementation of the MSFD (descriptors 1, 2, 3, 4, 6 and 10). The majority of the national advice part of the programme is primarily reported to the Swedish Agency for Water Management (SwAM).

Important products from the programme include the annual advice for setting catch quotas of commercially exploited fish species in the North and Baltic seas (via ICES to the EU-commission) and advice for different fisheries management actions (e.g. the landing obligation) to the Swedish government and the EU-commission. Data from the annual trawl surveys and coastal fish gill-net monitoring programmes are also used for status assessments of offshore fish stocks, coastal fish communities and ecosystems in the Swedish marine waters, and surveillance reports from the nuclear power plant industry. Results from the programme are also presented in popular science form including “Fisk och skaldjursbestånd i hav och sötvatten” (report from SLU and SwAM that summarizes the status of important fish and shellfish stocks in Sweden) and articles in the national HAVET publication, which synthesis of the environmental status of the marine waters in Sweden. Besides this, a substantial part of the data and syntheses from the programme are published in the report series of the department of aquatic resources “Aqua reports” (approximately 15-20 issues per year).

There is a tight link between monitoring and assessments and research in the programme. The data collected within ***Coastal and Sea areas*** are used in several research projects financed by the EU BONUS programme, EU’s FP7 programme, the Swedish research council FORMAS, as well as in research and development projects financed by the Swedish Environmental Protection Agency and SwAM.

The programme's involvement in education has so far been limited to guest lectures at other departments of SLU and at other universities (Uppsala, Stockholm, Gothenburg and Umeå universities). From 2016, two courses will be developed at the Department of aquatic resources, for which the content will heavily rely on knowledge and hands-on examples from the programme ***Coastal and Sea areas***.

The programme is to a large extent relying on external funding, mainly on commission from management authorities. In 2015, for example, external funding constituted about 95 % of the budget of the programme, with SwAM as the major provider of finance contributing 87 % of the total budget. The remaining part of the external funding is mainly attributable to the industry (mainly surveillance programmes of the nuclear power plants) and to a minor part from local county boards. Internal funding from SLU comprises only about 5 % of the total budget. The Swedish government has directly missioned SLU with an additional task of conducting environmental monitoring and assessment (Foma) besides teaching and research. In this context ***Coastal and Sea areas*** is one of the largest Foma-programmes at SLU, but relies heavily on external funding. Also, the programme is rather unique nationally in that a significant part of the programme is focused on giving biological advice for the management and exploitation of aquatic resources, mainly fish and shellfish.

Coastal and Sea areas has the major part of its activities and projects within the Department of aquatic resources (Institute of Marine research and Institute of Coastal research), but the programme is linked to other departments at SLU as the Department of aquatic sciences and assessment, and the Swedish species information centre via the Foma-programmes *Lakes and watercourses* and *Biodiversity*. Outside SLU, the ***Coastal and Sea areas*** has extended cooperation with both Swedish and international universities and management bodies focusing on monitoring and assessment of fish, shellfish and marine ecosystems and management advice for fisheries.

Due to its tight link to its main funding body SwAM, the projects within ***Coastal and Sea areas*** are already very much coordinated. The role of the coordinators of the programme is hence mainly to support SLU in Foma-related questions and reporting of the programme, to represent the programme at SLU, and to coordinate the development of the programme within the Department of aquatic resources.

With respect to monitoring and assessments of commercial offshore fish and shellfish species, ***Coastal and Sea areas*** via the Department of aquatic resources is the only principal actor in Sweden. With the new ocean going research vessel for which SLU will act as ship-owner, the position of the Department of aquatic resources as a provider of offshore marine monitoring will be further strengthened. Potential competitors in this niche are mainly found in other countries as Denmark (DTU-Aqua), Germany (GEOMAR) and Finland (LUKE and SYKE). Monitoring and assessment in coastal areas is less expensive with regards to equipment such as research vessels and fishing gears (gill- and fyke nets are used instead of trawls). Despite that the Department of aquatic resources is the principal actor also for this in Sweden, the niche nowadays contains several actors also including private consultant companies.

Formal and legal commitments

Since 2012 the Department of aquatic resources and Foma-programme ***Coastal and Sea areas*** have an annual formal commitment from SLU considering "Authority and expert support". This commitment includes maintenance of an infrastructure and specific support for national monitoring and assessments within the ***Coastal and Sea areas*** – programme. Explicit focus is devoted to management advice and maintenance of databases. The major formal commitments within the programme concerns annual contracts with SwAM, focusing for example on data collection and assessments within the DCF-framework, coastal fish monitoring, MSFD-work and no take areas, and with the industry for the surveillance programmes of the nuclear power plants in Sweden.

SLU's niche

The Department of aquatic resources has, alongside research and education, an extensive activity in the field of environmental monitoring and assessment. The Swedish National Board of Fisheries' research department was assigned to the university in 2011, resulted in an extended mission for SLU to conduct environmental monitoring and assessments of the coasts and the seas. This work involves regular collection and compiling of biological information, biological analysis and presenting results as a basis for decisions about the sustainable use of biological natural resources and environmental assessments of anthropogenic impact. SLU's present advice niche is to offer support

and advice with a scientific basis and which is closely linked to the university's research.

The different environmental assessments are primarily used for development of national environmental objectives, strategic aquatic decisions and for cooperation within the EU framework with international conventions. One key feature of the ***Coastal and Sea areas*** program is the tight link and advice to the resource use in aquatic environments. An important reason for conducting environmental monitoring and assessment at SLU is the synergy with research, but also the environmental monitoring brings a wide range of skills together compared to other bodies. Another important fact is the feed-back loop between Foma and where the results from research projects directly feed into environmental assessments, and management advice and vice versa. The collective expertise allows for continuity and an opportunity to set high standards for data collection, analysis and assessment. County administrative boards and SMHI contribute to the overall environmental assessments and support the interpretation and evaluation of fisheries data. Internationally, the program ***Coastal and Sea areas*** can be likened to activities and programs in other countries like the Natural Resources Institute (LUKE) in Finland, Havforskningsinstituttet (IMR), Norway, and Institute for Akvatiske resurser, Technical University of Denmark (DTU Aqua) in Denmark, to name a few. At the national level, there is no counterpart with respect to offshore trawl surveys and data collection, but for more coastal monitoring and assessments other Swedish universities and private consultant firms are active actors.

Economic summary

The yearly income per income source for the programme between 2012-2015 is shown in table 1. The funding for coordination, synthesis, management and expert support, and SLU-projects comes from SLU directly via government funding and the Swedish programme for rural affairs. Since the programme was started in 2012, and the Department of aquatic resources was included at the NJ-faculty from the 1st of July, the sum for coordination and SLU projects was low, but has increased. The programme has only been involved in one synthesis so far that was initiated in 2013. The decrease in the amount of funding for management and expert support in 2014 and 2015 is that approximately 2 millions SEK of the total support (approximately six

millions annually) from SLU to the Department of aquatic resources was transferred to research and post-graduate education at the department.

The amount of external funding (mainly from SwAM) has increased over the years. In 2015 there was a significant increase in the funding from SwAM to the programme, partly as a result of an increased focus and demand of support and management for aquatic resources and fish stocks following the obligations of the MSFD, the marine spatial planning directive and landing obligation of the CFP. Since 2015 there is three plus three-year agreement of approximately 100 million SEK annually to safeguard the knowledge and expert needs of SwAM. From a financial viewpoint, the coming years are hence promising for the programme, and SLU is currently the largest and principal provider of data and management support for aquatic ecosystems in Sweden.

To that end, the programme is despite being one of the largest at SLU heavily dependent on external funding and has been so during the whole programme ***Coastal and Sea areas*** period. The recent increase in funding and demand is generally very positive, but also includes a challenge for the programme to recruit experts with the correct knowledgebase to perform the obligations. In addition, in spite of the long-term agreement with SwAM, the content and funding of the programme is sensitive to changes in how much the current government focus on management and monitoring of aquatic ecosystems and its components.

Table 1. Income per source (in thousands SEK) of the programme during the period 2012-2015.

Source/Year	**2012**	**2013**	**2014**	**2015**
Coordination	200	310	317	319
Synthesis	0	240	0	0
Management and expert support	4000	4023	2048	2058
SLU projects	0	2710	2822	2612
External projects	75 724	72 086	79 378	100 739
Data hosting	533	1 683	1 807	2 612
Sum (exl. external funding)	**4 200**	**7 283**	**5 187**	**4 989**
Share external funding	95%	91%	94%	95%
Sum total	80 456	81 051	86 372	108 339

Most important results and stakeholders

The most important stakeholders for ***Coastal and Sea areas*** are SWaM, The ministry of Environment and Energy, the ministry Enterprise and Innovation, ICES, (International Council for Exploring the Seas), the EU Commission, the Swedish Environmental Protection Agency, HELCOM and OSPAR. On the national level important stakeholders also includes local county boards, national fishery bodies, NGO's and the nuclear power plant industry. A part of the work within ***Coastal and Sea areas*** concerns providing advise for exploited fish species, NGO's as WWF and the citizens in Sweden are also requesting this information.

During the four years of the programme, the 117 publications in peer-reviewed journals and more than 350 reports produced (Appendix 1) highlights that the knowledge acquired is widely spread and communicated. Many of the reports are popular-science oriented reports hence targeting a wide audience. Key results of the programme over the years are summarized below.

- *Positive effects of no-take areas.* The no-take area for cod in Kattegat that was established in 2009 was evaluated in 2012. The management action was concluded to have influenced to

small recovery of cod in the area and also benefited the general environmental status in Kattegat.

- *Fishing is affecting the biology of fish.* Studies on the growth patterns and trawl selectivity of the Baltic cod stock show a drastic decrease in individual growth rates and growth potential for fish in the stock. The slow growth, poor condition and general poor quality of the fish in the stock in turn calls for management actions. The Department of aquatic resources are working actively to improve the management of the stock. One important finding is that the selectivity of the trawl fisheries has an important effect.
- *Protection of essential habitats favour fish populations and production.* Recent studies from the Department of aquatic resources suggest that the stock size of perch and pikeperch in the Baltic Sea to a large extent is influenced by the availability of nursery and recruitment habitats. These habitats are in turn impacted by eutrophication and shoreline exploitation Habitat protection is hence crucial to support local fisheries and sustainable populations of important predatory fish in the coastal areas of the Baltic Sea.
- *Alien species are increasing along the Swedish coast.* Via the coastal fish monitoring programme in Sweden, the first records in Sweden of the alien fish species round goby was reported in 2008. The first record was from the Blekinge archipelago in southern Sweden, and during later years the fish has been recorded in the monitoring programme further north along the Swedish Baltic coast.
- *The behaviour of seals affects fisheries management.* Damages on fishing gears from seals pose a big challenge for the small-scale coastal fishery. Studies show that some seal males have specialized on attacking fishing gears, and that these individuals return to the same gear during several years.
- *A large research project focusing on ecosystem-based management has been finalized*. In 2013, the PLANFISH-project that focused on the role of predatory fish and top-down control for ecosystem structure and functioning was finalized. The project was initiated in 2008 by the Swedish board of fisheries and from 2011 lead by SLU (Department of aquatic resources) and SwAM. More specifically, the project assessed the effects on the ecosystem from the presence and absence of predatory fish, and if a predatory dominated system can be reinstated. The main objective of the project was to provide input to the management of coastal- and offshore fisheries in the Baltic Sea, and parts of the results from the project has now been included in the management of Baltic Sea fisheries. The project yielded more than 25 peer-reviewed papers, used data from different sources

of monitoring programmes, field- and laboratory experiments and developed food web models.

- *A permanent exhibition on the Baltic Sea is being built in Skansen*. Skansen (in Stockholm) is one of the most famous zoo's in Sweden, and with the funding from the Baltic Sea 2020 foundation and input from experts from SLU and Stockholm University, a permanent exhibition focusing on the Baltic Sea are under development. This exhibition will server as an excellent opportunity for communicating research and related Foma-programmes at SLU, for example ***Coastal and Sea areas*** and *Eutrophication*. The exhibition are planned to open for the public in 2017, and currently the project are in a planning and design phase.
- *Planning and building of a new oceanic research vessel.* With a start in 2015, a new oceanic research vessel is being planned and designed in Sweden. Sweden is currently depending on an older Danish vessel to carry out the annual trawl surveys as requested within the DCF. SLU will be the ship owner of the vessel and is expected to be in operation 2019.
- *Indicators for the MSFD developed and published.* During recent years researchers at the Department of aquatic resources have lead and been involved in development of indicators to assess the status of marine ecosystems as required under the MSFD. The indicator development work has relied on the monitoring data collected within ***Coastal and Sea areas***. In late 2015, the first indicator reports and harmonized assessments of coastal fish and salmon in the Baltic Sea were published on HELCOM's web.
- *Monitoring data used to assess long-term changes in coastal fish and zoobenthos communities*. Monitoring data from reference areas within the surveillance programmes of nuclear power plants have been used to assess structural changes in coastal fish- and zoobenthos communities since the 1970's. The observed changes could be associated to increasing water temperatures and decreasing salinity levels in the Baltic Sea.
- *Effects of the eel management plan detected in coastal fish monitoring.* Extensive time-series from coastal fish monitoring programmes (including surveillance programmes of nuclear power plants) show increase the in abundance of adult eels in the catches despite decreasing recruitment of glass eels. This result is likely linked to decreased mortality of adult eels as part of the of the eel management plan.
- *Integrated and long term monitoring shows decreasing health status of coastal fish.* In four coastal sites along the Swedish coast there is a national monitoring programme surveying hazardous substances, fish health and fish population development as a cooperation between SLU, the Swedish museum of national

history and Gothenburg University. The programme has been running since the 1980's, and despite that the sites are classified reference sites with low levels of direct human impact, there has been a steady decrease in the health status of the fish. This development is likely caused by a cocktail effect of several hazardous substances acting in concert, rather than the impact of one single substance.

- *SLU's ecosystem profile*. The unique knowledge of the Department of aquatic resources and SLU in this field serves as the basis for the implementation of the ecosystem approach within ICES and thus a basis for other member countries and international organizations. SLU's participation, through scientifically based substrates of ICES, will also contribute directly to international and national management of marine resources continuously developed eg through input to fishing quotas, the MSFD, and the development of technical fisheries measures. SLU has repeatedly helped to develop the international management of fisheries resources through science-based substrates. SLU's cooperation within ICES means that SLU's research in the marine area develops, strengthens and gets a clear international image. Cooperation will also help to develop networks in specific subject areas, which constitute an important basis for working with international partners, seek greater international research projects and further strengthen the university's research profile.

Self evaluation of results

Foma at SLU both has overarching goals and programme specific goals. Below we evaluate these for the programme ***Coastal and Sea areas***.

Goal 1: There will be a strong connection between Foma and other missions of SLU

Research and education are the other two missions at SLU besides Foma. The programme specific goals of ***Coastal and Sea areas*** includes a strong link between research and Foma to safeguard the quality assurance and usage of the work within the programme, to use and highlight the products from the programme in education at SLU, and to initiate courses at SLU focusing on marine environmental management and sustainable resource use.

The work within ***Coastal and Sea areas*** has a strong and direct link to research at SLU. A lot of the research undertaken at the Department of aquatic resources is based on data and assessments that is collected and undertaken within the programme. The 118 articles published in peer-reviewed international scientific journals since 2012 is a prime example of this. During the past years, several national and international research projects that are based on Foma-data and assessments have been initiated at the Department of aquatic resources. See the chapter "Synergies with research and education" below for details. There is also a feedback loop from research to Foma, where the results from research projects feed into monitoring strategies, assessment procedures and management advice. In all, this feedback strengthens the work with ***Coastal and Sea areas*** with regards to quality assurance and user values.

Since the Department of aquatic resources was established at SLU in 2011, no formal education assignments have been established earlier. Products from the programme have, however, been used when teachers from the Department of aquatic resources have been involved in courses managed by other departments SLU and other universities (Uppsala University, Stockholm University, Gothenburg University, and Umeå University). From 2016 two courses will be administrated at the Department of aquatic resources, for which the content will heavily rely on products and data collection from the programme ***Coastal and Sea areas***.

Goal 2: Foma will be a leader and contribute to international progress in scientifically based assessments

The programme specific goals includes to be a central actor in the international cooperation for achieving environmental objectives, to support international projects focusing on research and Foma in the marine environment, and to increase the number of international scientific publications and reports from the programme.

During the last decade, staff from the Department of aquatic resources (before 2011 the Swedish board of fisheries) has had an active and leading role within ICES, HELCOM and OSPAR. This includes being chairmen of several ICES and HELCOM groups (e.g. WGBFAS, WGIAB, WGBIFS, WGVHES, WKSPATIAL, HELCOM FISH PRO II), and active participation within the work of OSPAR (e.g. COBAM and biodiversity expert groups). Products from the ***Coastal and Sea areas*** programmes

are hence widely used within international monitoring and assessments of fish and fisheries in the North and Baltic Seas. This participation is also tightly linked to the second programme specific goal (to support international projects focusing on research and Foma in the marine environment), and the research projects listed under goal one above also feeds in here.

The third programme specific goal relates to the production of international scientific publications. As mentioned above, the programme has produced a high number of publications in peer-reviewed international scientific journals since 2012. The number has, however, varied between years without any increasing trend. With regards to scientific reports, there has been a general increase over the years, from 71 in 2012 to over 90 in 2015.

Goal 3: Delivery of decision support that allows the exploitation of resources to be weighed against the environmental consequences of that exploitation

This is one of the key objectives and activities of the programme ***Coastal and Sea areas***. The programme specific goals include to undertake long-term and quality assured monitoring and data collection of marine fish, fisheries and ecosystems, to provide management advice for coastal and marine fish stocks, communities, habitats and ecosystems, and to develop syntheses on the status of the marine environment for decision support concerning resources use and ecosystem based management.

As mentioned in the programme overview section above, the work within ***Coastal and Sea areas*** is to a large extent built upon on data collection of fish and fisheries, and storage of the data collected in quality assured databases. The monitoring do in some cases date back to the 1960's and 1970's, and includes both international trawl surveys and national coastal surveys using passive gears. Currently, there is an increased demand of these activities with the reformation of the CFP and implementation of the MSFD, and there is an on-going work to make the data collection more relevant and cost-effective, and the data storage systems up-date and quality assured.

Management advice and support also constitutes a ground pillar for the work of the ***Coastal and Sea areas***. This is very much focused on providing status assessments and biological advice within ICES for catch quotas of commercially exploited fish species in the framework of the CFP. Besides this the data collected and assessments undertaken are widely used within the regional sea conventions of HELCOM and OSPAR, but also to provide advice for local management plans and measures to local county administrative boards and the private industry. This includes for example development of indicators and status assessments for fish and fisheries, and as the basis for regional and local marine spatial planning. During the last decade there has been an increased interest from managers in implementing the ecosystem based approach to management. Significant parts of the work within ***Coastal and Sea areas*** are focused on this topic. Examples includes being chairmen and active participation in the ICES Integrated ecosystem assessment working groups, projects concerning ecosystem based management, and inclusion of ecosystem components in fisheries management advice (ecosystem approach to fisheries management). During recent years, the data and products produced within ***Coastal and sea areas*** have been increasingly used within the implementation of the MSFD in the Baltic and North Sea areas, mainly for descriptors 1, 2, 3, 4, 6 and 10. Besides providing direct advice upon request, advice for important fish and shellfish species in Swedish waters are regularly provided through the popular science report “Fisk och skaldjursbestånd i hav och sötvatten” and in articles in the HAVET-report. In addition, yearly reports including environmental advice is provided within the surveillance programmes of the nuclear power plants.

The third programme specific goal (to develop synthesis on the status of the marine environment for decision support concerning resources use and ecosystem based management) is the least developed so far. The report “Fisk och skaldjursbestånd i hav och sötvatten” serves as one such product as do the integrated ecosystems assessment conducted within the ICES Integrated ecosystem assessment working groups. In 2013 a synthesis project focusing on causes of eutrophication in coastal waters was launched at the programme together with other Foma programmes and departments at SLU. Unfortunately, this work has not been finished yet.

Quality assurance

The Department of aquatic resources has since many years had a focus on quality assurance work in different aspects to make quality controlled environmental data available. The department has a long tradition of calibration exercises regarding age determination of otoliths, both on a national level within the department but also through international exchange of otoliths and calibration workshops.

SLU has recently developed a quality guide, including templates for self-evaluation to achieve the desired quality levels. In 2015, the data management routines of the "coastal fish data hosting" was evaluated and developed within these quality assurance procedures. The following steps in the process include quality assurance of the fish monitoring practices. Important steps in this process have been to clearly define and document the roles and routines. Also, the accreditation of "fish monitoring" via the SWEDAC accreditation system was initiated in 2015. Already established manuals and documented routines will facilitate the accreditation.

For DCF-related activities, data quality, and the reporting of data quality, has been a standard terms of reference in many forums. It has also been a major theme in the revision of the DCF, and has been discussed at length by STECF, RCMs and ICES expert groups dealing with quality assurance of data collected under the DCF. In addition to the ongoing international data quality work within DCF, the DCF trawl surveys were worked through the SLU quality guide and internal workshops were arranged in 2015. Responsible persons for the surveys worked through the SLU developed self- examination templates and there were valuable outcomes, which is presently being used to improve some of the steps in the data quality assurance.

The work undertaken within ***Coastal and Sea areas*** will be environmental certified according to the ISO140001 standard in 2016 which includes an assessment of the environmental impact of the programme, and that there is a continuous work to reduce the environmental impact of the work within the programme.

Stakeholder collaboration

All projects within the programme ***Coastal and Sea areas*** are implemented in close cooperation with stakeholders, being financial

bodies of the work. The collaboration includes biological advice underlying quota setting for commercially exploited fish and shellfish stocks, and fisheries regulations via working groups and direct communication to the EU-commission and Swedish ministry of enterprise and innovation, but also directly together with SwAM in specific projects. When establishing the outline of the projects financed by SwAM, there is a close and intense dialogue between project leaders at SLU and responsible persons at SwAM. All projects are disseminated in written reports annually to SwAM, and several of the projects are also presented during seminars with responsible stakeholders and other governmental and non-governmental bodies.

There is also a substantial involvement in the work of ICES, STECF, HELCOM and OSPAR (see also the Advice section in Appendix 2). The majority of international collaboration is mediated via these organizations and conventions. On the national level, collaboration mainly includes projects financed by local county agencies, NGO's and the private industry. Examples of this collaboration are preparation of local and regional fisheries management plans including input on potential management measures for fish and shellfish stocks and communities, development of fishing gears, development of risk assessments and preparation of surveillance programs within the nuclear power plant and pulp-mill industry.

The core of the programme ***Coastal and Sea areas*** is the data collection mainly within DCF, which is a necessity to remain a main partner for our stakeholders. All countries with commercial fishing opportunities need to collect fish stock specific data. SLU is collecting data on fish caught and landed by commercial fisheries, including samples from ports along with discards sampled on board fishing boats. For stock assessments fishery independent data collection (*i.e.* trawl surveys/acoustic surveys) is also required. All this data collection is hence the link between national environmental and resource monitoring and the work of international bodies including the EU commission and others like ICES, STECF, HELCOM and OSPAR.

There is also a long-term collaboration in projects within ***Coastal and Sea areas*** with commercial and to some extent also recreational fishermen, to facilitate a cost-effective way of collecting data from commercial and recreational fisheries. This also includes close cooperation with fishermen for development of more effective, size-selective, and environmentally friendly fishing gear, and fishing gears

which reduce the conflict between fishermen and marine birds and mammals (see Appendix 2 for details).

SLU is data host for both marine and coastal fish monitoring, and this mission includes making monitoring data publically available. The European Commission, ICES, researchers from other universities, local fisheries organizations, local county agencies, and private consultant firms for example use the databases. The data hosting also includes advise to stakeholders on how to use and interpret the data stored in the data base.

Besides collaboration with stakeholders and financers, the results of the different projects within the programme are presented and disseminated during national stakeholder conferences such as Flora- och faunakonferensen, Miljöövervakningsdagarna, Havs- och vattenforum, Havsmiljöseminariet, and on subject specific conferences nationally and internationally. Besides this, as highlighted above, the results within the programme are presented in the HAVET publication and annually in "Fisk och skaldjursbestånd i hav och sötvatten". In many of the research projects that are based on data from the ***Coastal and Sea areas*** programme (see next paragraph), there are a strong element of stakeholder collaboration and dissemination.

Finally, in late 2017 a permanent exhibition on the Baltic Sea at the Zoo Skansen in Stockholm is planned to be opened. SLU and ***Coastal and Sea areas*** are currently deeply involved in the preparation of the exhibition and its content. Since Skansen has approximately 1.4 million visitors annually, the exhibition offers an outstanding opportunity for SLU to present their work concerning Baltic Sea to a wider national and international public.

Synergies with research and education

Synergies with research are substantial since several research projects in connection to ***Coastal and Sea areas*** have been completed or initiated during the period 2012-2015. Among such projects, the following can be mentioned INSPIRE, PREHAB, BALCOFISH and GOHERR (financed by the EU BONUS programme), ECOKNOWS, BENTHIS, BUFFER, ECOSEAL, GAP, GAP1, HARDROCK, LOT1, MAREFRAME (EU's FP7 programme), PLANTFISH (the Swedish research council FORMAS), and WATERS, VALUES, IMAGINE, Ecosystem-based approach for developing and testing pelagic food web

indicator and Status assessment of the MSFD in the Baltic- the coastal fish example (financed by the Swedish Environmental Protection Agency and SwAM). A large number of papers have been published in international research journals with high impact factor (Appendix 1), which shows that the ***Coastal and Sea areas*** synergies with research have resulted in work of high quality. Within the programme, substantial effort is being made to create networks between researchers, environmental analysts and government agencies and other users of the findings. This networking should be maintained and developed further in order to ensure a high future quality of ***Coastal and Sea areas*** related research.

Synergies with basic and postgraduate education are on the rise from a low level and need further development. During 2012-2014, only one thesis project work on coastal perch was connected to ***Coastal and Sea areas***, although the number of theses has since then increased substantially. In 2015, eight theses (three Master's, five Bachelor's) related to Coast and Sea were completed. Likewise, during 2012-2014, one course at Stockholm University and one at the Gothenburg University made use of ***Coastal and Sea areas*** methods and results. However, two new courses at SLU are anticipated to create much more synergies between ***Coastal and Sea areas*** and basic education during the coming academic year. One of the new courses "Ecology for fish management and conservation" will focus on ecology as well as practical fish management examples, whereas the other "Principles of fisheries science" will include an introduction to stock assessment, as well as a critical evaluation of data collection. Both courses will cover coastal and marine ecosystems, but also freshwaters. Foma data will be used in tuition, and the courses are anticipated to lead to insights regarding how ***Coastal and Sea areas*** could be improved.

The number of PhD students connected to ***Coastal and Sea areas*** is also rising from a low level (one was registered 2013, two in 2014, three in 2015, and their postgraduate studies are still ongoing). Their synergies with ***Coastal and Sea areas*** differ depending on the student in question, but several students are involved in DCF; regarding, e. g., cod, herring or sprat, and use ***Coastal and Sea areas*** data in their analyses. Moreover, the short-term goals for postgraduate studies at Aqua include that each PhD student should be involved in practical Foma work at 5-20% of the time, thereby extending the total postgraduate study period from four years up to five. In 2015 a PhD-

thesis undertaken at Stockholm University but with close cooperation to the ***Coastal and Sea areas*** programme was defended.

Trends in the future

During recent years, the work and products within ***Coastal and Sea areas*** have been increasingly requested both within the reformation of fisheries management under the Common Fisheries Policy, and in the implementation of the new Marine Strategy Framework Directive.

Within the CFP for example, the landing obligation has lead to increased attention on monitoring and assessment of fisheries by-catch, and multi-species assessments for Baltic Sea cod, herring and sprat stocks is under development. In addition, the reformation of the CFP in 2013 states that there should be a larger degree of regionalisation (data collection from fisheries should be coordinated within sea regions), a new financing system for environmental assessment of fish and fisheries (EMFF), and finally an integration of the CFP and MSFD in which the CFP to a larger extent should consider the ecosystem perspective in assessments and management. In Sweden, SLU plays a principal and significant role for the implementations of these new directions.

SLU also plays an important role in the implementation of the MSFD in Sweden, mainly concerning fish and food webs. Many indicators to assess the status of our seas still, however, need substantial development before reaching an operational level. This includes indicators for several of the descriptors including biodiversity aspects, alien species, food webs, hazardous substances in fish, marine litter, effects of marine infrastructure and constructions and underwater noise, for which all SLU has the competence to contribute to some extent. SLU is also deeply involved (within for example HELCOM and coastal fish) in the harmonization and coordination of monitoring and assessments as requested by the directive. The indications we get from our stakeholders are that there is an urgent need for development work and more effective and wider monitoring programmes to meet the objectives of the MSFD. Whether or not this includes funding for additional monitoring programmes or more cost-effective current programmes is not outlined yet. In all this suggest that SLU already has a central role in the implementation of the MSFD, but there is clearly

also a potential for a development of the programme ***Coastal and Sea areas*** in this respect.

Additional directives in which the Foma programme already are involved and in the future likely will be even more involved in is the Marine Spatial Planning Directive (MSPD), and the upcoming directive concerning alien and invasive species. SLU is already involved in providing advice for marine spatial planning on the local level in Sweden concerning fish and their habitats, an area that likely will expand with the implementation of the directive. ***Coastal and Sea areas*** has recently started the work of advising the government on fishing regulations needed to meet conservation objectives in Sweden's numerous marine Natura 2000 areas. In addition to this, SLU will be involved in the planned large mapping project of marine resources and habitats that will start in Sweden in 2016 and continue for several years. With regards to alien species, SLU is already involved in projects concerning the marine species American lobster and round goby. In the future, monitoring programmes for these two and other invasive species in the aquatic environment is foreseeable.

The Swedish government is considering a national monitoring programme for fish disease in marine waters, in response to a number of cases related to fish health and to new initiatives to increase aquaculture production. The National Veterinary Institute in Sweden is investigating how such a programme could be developed in collaboration with the ***Coastal and Sea areas*** programme and existing fish surveys.

Currently, we see no indications on cuts in existing monitoring programmes, neither in the offshore trawl surveys focusing on commercial fish species or in coastal fish monitoring. On the contrary, one additional monitoring area for coastal fish was instated in 2015. There might, however, be some minor changes in the coastal fish monitoring programme in coming years since the programme is currently under evaluation with focus to make it more cost-efficient and with a higher data quality. Moreover, of paramount importance for the monitoring undertaken within the ***Coastal and Sea areas*** programme is the building of a new, and in Sweden only, oceanic research vessel. As mentioned earlier, SLU will be the ship owner, and this directed investment from the Swedish government in turn indicate an increased and long-term commitment on the monitoring of marine ecosystems and their resources. The research vessel will also be used for the

oceanic monitoring programme of SMHI (Swedish Metrological and Hydrological Institute), and will hopefully naturally lead to a deeper integration between SLU and SMHI. A similar coordination and more ecosystem oriented approach for monitoring is also very well in line with the requests of international directives (as highlighted above). One important outcome of the JMP EU project investigating the scope for Joint Monitoring Programmes in the North Sea, is that the internationally coordinated fish survey is quite unique and could serve as a platform for future development. From SLU's point of view, it would be wise to further develop and expand existing surveys and monitoring programmes within ***Coastal and Sea areas*** to also include monitoring of additional components of the ecosystem, building on our international network. To facilitate this, however, the current monitoring procedure needs to be developed and made more effective. This in turn requires directed investments and projects focusing on this issue, something that the project "Integrated surveys" within the ***Coastal and Sea areas*** are focusing on by firstly assessing the potential for electronic registration directly into existing databases when monitoring to make available personal for other sampling and analyses.

Brief SWOT-analysis

Strengths	**Weaknesses**
Long term monitoring data, stored in person independent databases	Still some data in person dependent databases
The content of the programme is highly requested	Diverse and large programme – a challenge to get a common understanding of common goals and aims. A challenge that all staff should feel involved and engaged in the work.
Strong international networks and established collaborations for harmonized surveys,	National and international barriers to harmonisation and synchronisation aiming at joint monitoring

databases and assessments	programmes to support integrated assessments
Strong link to research	Water is not a main focal area of SLU – a challenge to integrate the work in the programme with other parts at SLU
Good and close cooperation with stakeholders	Lack of teaching to develop education within the field
Wide knowledge base	Mismatch between present assessment and advice and the data needs and scientific knowledge to support an Ecosystem based fisheries management.

Opportunities	**Threats**
Develop education through the design of new courses for basic education	Competition with private consultant firms
Continue develop an ecosystem perspective in the work	Funding of the programme to a large extent dependent on political will at the national and EU level
Harmonized fish surveys as a potential platform to develop ecosystem surveys	Swedish share of EU funding for fish monitoring may become based on the size of the fishery
Increase integration with other parts at SLU	Costs vs. funding to operate a new research vessel

Develop management tools and measures	
Regionalisation of DCF provides flexibility to tailor monitoring by area	
New research vessel	
Development and introduction of effective data collection methods based on new technology including checks of data quality.	

Programme development

The Foma-programme ***Coastal and Sea areas*** are the most recent established programme at SLU, and have during its four years (formed in 2011) of existence begun to form its structure and organization. One obvious step forward is to form an external reference group for the programme, including important stakeholders such as ministries, NGO's, fisheries organizations, environmental organizations and county agencies. Today, the programme already has a strong connection with SwAM but the next step should also include a strengthened and more direct dialogue, interface and communication with the general public and society in Sweden. Currently, the majority of the communication and interface of the programme is mediated via local and national authorities and governmental agencies.

The programme ***Coastal and Sea areas*** has widened SLU's niche to also include water and foremost marine and coastal environmental monitoring and assessments. Recent initiatives in profiling SLU as a "blue" university is still in its infancy and it is crucial that coordination, cooperation and dialogue between programs and departments at SLU working with water-related issues are developed even further. It would hence be more than welcome, and certainly of strategic significance that the water profile of SLU is strengthened and that there is an increased cooperation across water related activities internally.

The Department of aquatic resources foresees that the programme ***Coastal and Sea areas*** also takes the lead in the development of monitoring methods in marine and coastal ecosystems to meet the demands from coming and current EU directives. New methods are also needed to encompass future challenges with respect to environmentally friendly and ethically sound methods to follow and assess the status of marine ecosystem components. For example, this may include development of monitoring methods to also cater for data collection of more ecosystem components than fish and shellfish during scientific surveys (i.e. integrated ecosystem monitoring) that are essential for assessments and valuation of ecosystem services. Another example where the programme ***Coastal and Sea areas*** need to develop is related to advances in food web and ecosystem modelling that is fundamental to enhance our understanding of biotic and abiotic interactions in the aquatic ecosystems. There is also a growing awareness of the public and governmental organizations to reduce the use and killing of live organisms in science and environmental monitoring. It is hence urgent to develop more ethically sound and non-destructive monitoring and assessments methods in marine waters. This could for example be an increased use of molecular methods for monitoring, usage of monitoring methods in which the surveyed animal is released after sampling, and a development of citizen science.

Finally, based on the broad national and international perspective, and vast collaboration and competence of the staff working within the ***Coastal and Sea areas*** programme, SLU have a firm scientific base and firm context. An increased participation from SLU in the strategic decisions of the EU commission during the implementation of new and revision of current directives and conventions concerning marine systems would be beneficial for SLU in general, the programme specifically, but not at least for the environment and our society.

Appendix 1. Publications, reports, PhD- and Msc thesis related to the Foma programme Coastal and Sea areas

Publications in peer-reviewed journals

2012

1. Alheit, J., Pohlmann, T., Casini, M., Greve, W., Hinrichs, R., Mathis, M., O'Driscoll, K., Vorberg, R. and Wagner, C. 2012. Climate variability drives anchovies and sardines into North Sea and Baltic Sea. Progress in Oceanography, 96: 128-139.

2. Andersson, J. Florin, .A.-B., Pettersson, E. Escapement of eel (*Anguilla anguilla*) in coastal areas in Sweden over a 50 year period. 2012. ICES J. MAR. Sci. 69 (6): 991-999.

3. Bacheler N.M., Ciannelli L., Bailey K., Bartolino V. 2012. Do walleye pollock exhibit flexibility in where or when they spawn based on variability in water temperature? Deep Sea Res. II 65-70: 208-216.

4. Bartolino V., Cardinale, M., Svedäng, H., Linderholm, H.W., Casini, M., Grimwall A., 2012. Historical spatiotemporal dynamics of eastern North Sea cod. Canadian Journal of Fisheries and Aquatic Science, 69(5): 833-841

5. Bartolino V., Ciannelli L., Spencer P., Wilderbuer T.K., Chan K.S. 2012. Scale-dependent detection of the effects of harvesting a fish populations. Mar. Ecol. Progr. Ser. 444: 251-261.

6. Bergek, S., Franzén, F., Quack, M., Hochkich, A., Kinitz, T., Prestegaard, T. and M. Appelberg. 2012. Panmixia in *Zoarces viviparus* L. in the Baltic Proper: Implications for environmental monitoring studies. J. Fish Biol. 80, 2302-2316.

7. Bergek, S., Ma, Q., Vetemaa, M., Franzén, F. and M. Appelberg. 2012. From individuals to populations - Impacts of environmental pollution on natural eelpout populations. Ecotoxicol. Environ. Saf, 79: 1-12.

8. Boström M.K., Östman, Ö., Bergenius, M. A.J., and Lunneryd, S-G. 2012. Cormorant diet in relation to temporal changes in fish communities. ICES Journal of Marine Sciences 69(2): 175-183.

9. Boström, M.K, Lunneryd, S-G., Hanssen, H., Karlsson, L. and Ragnarsson, B. (2012) Diet of the Great Cormorant (Phalacrocorax carbo sinensis) at two areas in the Bay Lövstabukten, South Bothnian Sea, Sweden, based on otolith size-correction factors. Ornis Fennica, 89: 157-169.

10. Bradshaw, C., Tjensvoll, I., Sköld, M., Allan, I. J., Molvaer, J., Magnusson, J., Naes, K., Nilsson, H. C. 2012. Bottom trawling resuspends sediment and releases bioavailable contaminants in a polluted fjord. Environmental Pollution 170: 232-24

11. Ciannelli L., Bartolino V., Chan K.S. 2012. Nonadditive and nonstationary properties in the spatial distribution of a large marine fish population. Proc. R. Soc. B 279: 3635-3642.

12. Cardinale M., Svedäng H., Bartolino V., Maiorano L., Casini M., Linderholm H. 2012. Spatial and temporal depletion of haddock and pollack during the last century in the Kattegat-Skagerrak. J. Appl. Ichthyol. 28: 200-208.

13. Cardinale M., Doerner H., Abella, A., Andersen, J. L., Casey, J., Döring, R., Kirkegaard, E., Motova, A., Anderson, J., Simmonds E. J. and Stransky C., 2012. Rebuilding EU fish stocks and fisheries, a process under way? Marine Policy, 39: 43-52

14. Cardinale, M. and Hjelm, J. 2012. Short term loss and long term revenue in a size-selective fishery. Marine Policy, 36: 903–906.

15. Cardinale, M., Svedäng, H., Bartolino, V., Maiorano, L., Casini, M., Hjelm, J. Linderholm H. 2012. Spatial and temporal depletion of haddock and pollack during the last century in the Kattegat-Skagerrak. Journal of Applied Ichthyology, 28: 200-208.

16. Casini, M ., Blenckner, T., Möllmann, C., Gårdmark, A., Lindegren, M., Llope, M., Kornilovs, G., Plikshs, M. & Stenseth, N.-C. 2012. Predator transitory spillover induces trophic cascades in ecological sinks. Proceedings of the National Academy of Sciences, 109(21), 8185–8189.

17. Eero, M., Vinther, M., Haslob, H., Huwer, B., Casini, M., Storr-Paulsen, M. and Köster, F.W. 2012. Spatial management of marine resources can enhance the recovery of predators and avoid local depletion of forage fish. Conservation Letters, 5: 486-492.

18. Feekings J., Bartolino V., Madsen N., Catchpole T. 2012. Fishery discards: factors affecting their variability within a demersal trawl fishery. PloSOne 7: e36409.

19. Gonzalez-Mirelis, G., Lundälv, T., Jonsson, L., Lindegarth, M., Sköld, M., 2012. Seabed Mapping and Marine Spatial Planning: A Case Study from a Swedish Marine Protected Area, Marine Ecosystems, Antonio Cruzado (Ed.), ISBN: 978-953-51-0176-5, InTech, Available from: www.intechopen.com/articles/show/title/seabed-mapping-and-marine-spatial-planning-a-case-study-from-a-swedish-marine-protected-area

20. Gårdmark, A., Östman, Ö., Nielsen, A., Lundström, K., Karlsson, O., Pönni, J. & Aho, T. 2012. Does predation by grey seals (Halichoerus grypus) affect Bothnian Sea herring stock estimates? ICES Journal of Marine Sciences, 69(8), 1448–1456.

21. Hidalgo M., Rouyer T., Bartolino V., Cervino S., Ciannelli L., Massuti E., Jadaud A., Saborido-Rey F., Durant J.M., Santurtn M., Pineiro C., Stenseth N.C. 2012. Context-dependent interplays between truncated demographies and climate variation shape the population growth rate of a harvested species. Ecography 35: 637-649.

22. Hornborg,S., P. Nilsson, D. Valentinsson and F. Ziegler. 2012. Integrated environmental assessment of fisheries management: Swedish Nephrops trawl fisheries evaluated with a Life Cycle approach. Marine Policy 36(6): 1193-1201.

23. Huss, M ., Gårdmark, A., van Leeuwen, A., de Roos, A.M. 2012. Size- and food-dependent growth drives patterns of competitive dominance along productivity gradients. Ecology, 93(4), 847–857.

24. Keinänen, M., Uddström, A., Mikkonen, J., Casini, M., Pönni, J., Myllylä, T., Aro, E. and Vuorinen, P. 2012. The thiamine deficiency syndrome M74, a reproductive disorder of Atlantic salmon (Salmo salar) feeding in the Baltic Sea, is related to the fat and thiamine content of prey fish. ICES Journal of Marine Science, 69: 516-528.

25. Lind, Y., Bäcklin, B. M., Lundström, K., Budge, S., Walton, M. & Karlsson, O. 2012. Stability of fatty acid composition in seal blubber during long-term storage. Marine Ecology Progress Series, 461: 283-291.

26. Lindegren, M., Dakos, V., Gröger, J. P., Gårdmark, A., Kornilovs, G., Otto, S. & Möllmann, C. 2012. Early detection of ecosystem regime shifts: a multiple method evaluation for management application. PLoS One, 7(7), e38410. doi:10.1371/journal.pone.0038410

27. Lloreta, J., Faliexb, E., Shulmanc, G. E. Ragad, J-A., Sasale, P., Muñoza, M., Casadevalla, M., Ahuir-Barajad, A.E., Monterod, F. E., Repullés-Albeldad, A., Cardinale, M., Rätz, H-J., Vilaa, S., Ferrer, D., 2012. Fish health and fisheries, implications for stock assessment and management: the Mediterranean example. Reviews in Fisheries Science, 20(3): 165–180,

28. Molecular Ecology Resources Primer Development Consortium, Abreu, A. A., Albaina, A., Alpermann, T. J., Apkenas, V. E., Bankhead-Dronnet, S., Bergek, S., Berumen, M. L., Cho, C-H., Clobert, J., Coulon, A., De Feraugy, D., Estonba, A., Hankelin, T., Hochkirch, A., Hsu, T-W., Huang, T-J., Irigoien, X., Irondo, M., Kay, K. M., Kinitz, T., Kothera, L., Le Héneanff, M., Lieutier, F., Lourdais, O., Macrini, C. M. T., Manzano, C., Martin, C., Morris, V. R. F., Nanninga, G., Pardo, M. A., Plieske, J., Pointeau, S., Prestegaard, T., Quack, M., Richard, M., Savage, H. M., Schwarcz, K. D., Shade, J., Simms, E. L., Solferini, W. N., Stevens, V. M., Veith, M., Wen, M-J., Wicker, F., Yost, J. M. & Zarraonaindia, I. 2012. Permanent genetic resources added to molecular ecology resources database 1 October 2011 - 30 November 2011. *Molecular Ecology Resources* **12**, 374–376.

29. Olsson, J., Bergström, L. & Gårdmark, A. 2012. Abiotic drivers of coastal fish community change during four decades in the Baltic Sea. ICES Journal of Marine Sciences, 69(6), 961-970.

30. Ovegård, M., Berndt, K., and Lunneryd, S-G. 2012. Condition indices of Atlantic cod (Gadus morhua) biased by capturing method. ICES Journal of Marine Science, 69: 1781-1788.

31. Rice, J., Arvanitidis, C., Borja, A., Frid, C., Hiddink, J., Krause, J., Lorance, P. Ragnarsson, S., Sköld, S., Trabucco, B. 2012. Indicators for Sea-Floor Integrity under the European Marine Strategy Framework Directive. Ecological Indicators 12: 174-18

32. Svedäng, H. & Gipperth, L. 2012. Will regionalisation improve fisheries management in EU? – An analysis of the Swedish eel management plan reflects difficulties. Marine Policy 36: 801–808.

33. Ustups D, Muller-Karulis B, Bergström U, Makarchouk A, Sics I .2012. The influence of environmental conditions on early life stages of flounder (Platichtys flesus) in the Baltic Sea. Journal of Sea Research 755: 77-84

34. Øresland, V., Horobin, R.W. (2012). Tracking living decapods larvae: mass-staining of eggs with neutral red prior to hatching. Biotechnic and Histochemistry 87:229-23

35. Östman, Ö., Bergenius, M.A.J., Boström, M.K. and Lunneryd, S-G. 2012. Do cormorant colonies affect local fish communities in the Baltic Sea? Canadian Journal of Fisheries and Aquatic Sciences 69: 1047-1055.

2013

36. Bergenius, M.A.J., Gårdmark, A., Ustups D., Kaljuste O., Aho T. 2013. Fishing or the environment – what regulates recruitment of an exploited marginal vendace (Coregonus albula) population? Fundamental and Applied Limnology. Advanc. Limnol. 64: 57–70
37. Bergström U, Sundblad G, Downie A-L, Snickars M, Boström C, Lindegarth M 2013. Evaluating eutrophication management scenarios in the Baltic Sea using species distribution modelling. Journal of Applied Ecology 50: 680–690
38. Bergström, L., Sundqvist, F., Bergström, U. 2013. Effects of an offshore wind farm on the local demersal fish community. Marine Ecology progress series 485: 199–210.
39. Bucas M, Bergström U, Downie A-L, Sundblad G, Gullström M, Lindegarth M, von Numers M, Siaulys A 2013. Empirical modelling of benthic species distribution and abundance in the Baltic Sea: evaluating the scope for predictive mapping using different modelling approaches. ICES Journal of Marine Science, 70: 1233-1243.
40. Bryhn, A. C., Ragnarsson-Stabo, H. and Olsson, J., 2013. Modelling the biomass of functional groups of fish in an archipelago bay of the Baltic Sea. Ecological Modelling, 10: 86–97.
41. Bryhn, A. C., Bergenius, M. A. J., Dimberg, P. H. and Adill, A., 2013. Biomass and number of fish impinged at a nuclear power plant by the Baltic Sea. Environmental Monitoring and Assessment,185: 10073-10084.
42. Börjesson, P., Jonsson,P., Pacariz, S., Björk, G., Taylor, M.I. & Svedäng, H. 2013. Spawning of Kattegat cod (Gadus morhua) – mapping spatial distribution by egg surveys. Fisheries Research 147:63-71.
43. Casini, M. (2013). Spatio-temporal ecosystem shits in the Baltic Sea: top-down control and reversibility potential. In "Advances in Environmental Research, Vol. 28". J. A. Daniels Ed., Nova Science Publishers, New York, pp. 149-167.
44. Colloca, F., Cardinale, M., Giannoulaki, M., Scarcella, G., Jenko, K., Fiorentino, F., Bellido J.M., Maynou, F. 2013. Rebuilding Mediterranean fisheries: toward a new paradigm for ecological sustainability in single species population models. Fish and Fisheries, 14: 89-109.
45. Florin A-B, Bergström U, Ustups D, Lundström K, Jonsson P. 2013. Effects of a large northern European no-take area on flatfish populations. Journal of Fish Biology 83: 939-962

46. Florin, A., Mo, K., Svensson, F., Schagerström, E., Kautsky, L., Bergström, L. (2013) First records of Conrad's false mussel, Mytilopsis leucophaeata (Conrad, 1831) in the southern Bothnian Sea, Sweden, near a nuclear power plant. Bioinvasions Records, 2: 303-309.
47. Fowler, C.W., Belgrano, A. and Casini, M. 2013. Holistic fisheries management: combining macroecology, ecology, and evolutionary biology. Marine Fisheries Review, Vol. 75, No. 1-2.
48. Grohsler, T., Oeberst, R., Schaber, M., Larson, N., and Kornilovs, G. 2013. Discrimination of western Baltic spring-spawning and central Baltic herring (Clupea harengus L.) based on growth vs. natural tag information. – ICES Journal of Marine Science, 70: 1108–1117
49. Hornborg S., Belgrano A., Bartolino V., Valentinsson D., Ziegler F. 2013. Mean trophic level and primary production required in Swedish fisheries over a century: possibilities and limitations of the indicators. Biol. Lett. 9: 20121050.
50. Huss, M., de Roos, A., Van Leeuwen, A., Casini, M. and Gårdmark, A. (2013). Cohort dynamics give rise to alternative stable community states. The American Naturalist, 182: 374-392.
51. Kinitz, T., Quack, M., Paulus, M., Veith, M., Bergek, S., Strand, J., Tuvikene, A., Soirinsuo, A., Hochkirch, A. 2013. Strong isolation-by-distance in the absence of genetic population structure in the eelpout (Zoarces viviparus, Linnaeus 1758). Ecological Indicators 27:116–12.
52. Kraak, S., Bailey, N., Cardinale, M., Darby, C., De Oliveira, J., Eero, M., Graham, N., Holmes, S., Jakobsen, T., Kempf, A., Kirkegaard, E., Powell, J., Scott, R., Simmonds, J., Ulrich, C., Vanhee, W., Vinther, M., 2013. Lessons for fisheries management from the EU cod recovery plan. Marine Policy, 37: 200-213.
53. Königson, S., Fjälling, A., Berglind, M. and Lunneryd, S-G. 2013. Male gray seals specialize in raiding salmon traps. Fisheries Research 148: 117–123
54. Königson, S., and Lunneryd, S-G. 2013. Development of Alternative Fishing Gear in the Swedish Small-scale Coastal Fisheries. Progress in Marine Conservation in Europe 2012 Proceedings of the Symposium Stralsund, Germany 18 - 22 June 2012 HTTP://WWW.BFN.DE/HABITATMARE/DE/DOWNLOADS/BFN-SCRIPTEN-339_PMCE2012_PROCEEDINGS.PDF
55. Lindegren, M., Staffan Waldo, S., Nilsson, P.A., Svedäng, H. & Persson, A. 2013. Towards sustainable fisheries of the Öresund Cod (Gadus morhua) through sub-stock specific assessment and management recommendations. ICES Journal of Marine Science 70:1140–1150.
56. Neuenfeldt, S., Righton, D., Neat, F., Wright, P., Svedäng, H., Michaelsen, K., Subbey, S., Steingrund, P., Thorsteinssson, V., Pampoulie, C., Andersen,K.H. & Metcalfe, J. 2013. Analysing migrations of Atlantic cod Gadus morhua in the north-east Atlantic Ocean: then, now and the future. Journal of Fish Biology 82: 741–763.
57. Nissling, A. Florin, A.-B. Thorssen, A. Bergström, U. 2013. Egg production of turbot, *Scophthalmus maxima*, in the Baltic Sea . Journal of Sea Research. 84: 77-86.
58. Olsson J, Bergström L, Gårdmark A (2013) Top-Down Regulation, Climate and Multi-Decadal Changes in Coastal Zoobenthos Communities in Two Baltic Sea Areas. PLoS ONE 8(5): e64767. doi:10.1371/journal.pone.0064767
59. Östman Ö, Boström M, Bergström U, Andersson J, Lunneryd S-G. 2013. Estimating competition between wildlife and humans– a case of cormorants and coastal

fisheries in the Baltic Sea. PloS One, 8(12): e83763. doi:10.1371/journal.pone.0083763
60. Snickars M, Gullström M, Sundblad G, Bergström U, Downie A-L, Lindegarth M, Mattila J 2013. Species-environment relationships and potential for distribution modelling in coastal waters. Journal of Sea Research 85: 116–125
61. Sundelöf, A., Wennhage, H. & Svedäng, H. 2013. A red herring from the Öresund (ICES 40G2): the apparent recovery of the Large Fish Indicator (LFI) in the North Sea hides a non-trawled area. ICES Journal of Marine Science 70: 1081–1084.
62. Svedäng, H. 2013. Comments to Froese et al. (2008): Size matters: Ne quid nimis. Fisheries Research 149:74–75.
63. Ulrich, C., Boje, J., Cardinale, M., Gatti, P., LeBras, Q., Andersen, M., Hemmer-Hansen, J., Hintzen, N.T., Jacobsen, J. B., Jonsson, P., Miller, D. C. M., Nielsen, E.E., Rijnsdorp, A.D., Sköld, M., Svedäng, H., Wennhage, H. 2013. Variability and connectivity of plaice populations from the Eastern North Sea to the Western Baltic Sea, and implications for assessment and management. Journal of Sea Research 84: 40-48

2014

64. Bartolino, V., Margonski, P., Lindegren, M., Linderholm, H., Cardinale, M., Rayner, D., Wennhage, H. and Casini, M. 2014. Forecasting fish stock dynamics under climate change: Baltic herring (Clupea harengus) as a case study. Fisheries Oceanography, 23: 258-269.

65. Bergström, L., Malm, T., Åstrand Capetillo, N., Ohlsson, H., Wahlberg, M., Rosenberg, R., Kautsky, L., Wilhelmsson, D. (2014) Effects of off shore wind farms on marine wildlife – a generalized risk assessment. Environ. Res. Lett. 9 034012

66. Bryhn, A. C., Königson, S., Lunneryd, S.-G. and Bergenius, M. A. J., 2014. Green lamps as visual stimuli affect the catch efficiency of floating cod (Gadus morhua) pots in the Baltic Sea. Fisheries Research, 157: 187–192.

67. Bryhn, A. C., Andersson, J., Petersson, E. 2014. Mortality of European glass eel (Anguilla anguilla juveniles) at a nuclear power plant. International Review of Hydrobiology 99: 312–316.

68. Bryhn, A. C., Königson, S., Lunneryd, S.-G., Bergenius, M. A. J. 2014. Green lamps as visual stimuli affect the catch efficiency of floating cod (Gadus morhua) pots in the Baltic Sea. Fisheries Research 157: 187-192.

69. Cardinale, M., Chacate, O., Casini, M., Chaúca, I. and Vølstad, J.H. 2014. CPUE trends of Hilsa kelee and Thryssa vitrirostris exploited by the artisanal finfish fisheries in Mozambique derived from an on-shore sampling of catches by trip. Scientia Marina, 78: 55-64.

70. Casini, M., Rouyer, T., Bartolino V., Larson N. and Grygiel, W. 2014. Density dependence in space and time: opposite synchronous variations in population distribution and body condition in the Baltic Sea sprat (Sprattus sprattus) over three decades. PLoS ONE, 9(4): e92278.

71. Diaz-Gil, C., Lövgren, O., Werner, M., Kaljuste, O., Margonski, P. and Casini, M. 2014. Spatio-temporal composition and dynamics of zooplankton in the Kalmar Sound (western Baltic Sea) in 2009–2010. Boreal Environmental Research, 19: 323-335.

72. Emanuelsson, A., Ziegler, F., Pihl, L., Sköld, M., Sonesson, U. 2014. Accounting for overfishing in life cycle assessment: new impact categories for biotic resource use. The International Journal of Life Cycle Assessment Int. J. Life Cycle Assess. 19: 1156-1168.

73. Gonzalez-Mirelis, G., Sköld, M., Lindegarth, M. 2014. Using vessel monitoring system data to improve systematic conservation planning of a marine protected area in Sweden. AMBIO, 43: 162-174.

74. Henati-Sundberg, J., and Hjelm, J., 2014. Can fisheries management be quantified? Marine Policy. Volume: 48:18-20.

75. Henati-Sundberg, J., Hjelm, J., Österblom, H. 2014. Does fisheries management incentivize non-compliance? Estimated misreporting in the Swedish Baltic Sea pelagic fishery based on commercial fishing effort. Ices Journal of Marine Science. 71(7):1846-1853.

76. Hentati-Sundberg, J., Hjelm, J., and Österblom, H. 2014. Does fisheries management incentivize non-compliance? Estimated misreporting in the Swedish Baltic Sea pelagic fishery based on commercial fishing effort. – ICES Journal of Marine Science, 71: 1846-1853.

77. Lindegarth M, Bergström U, Mattila J, Olenin S, Ollikainen M, Downie A-L, Sundblad G, Bučas M, Gullström M, Snickars M, von Numers M, Svensson JR, Kosenius A-K 2014. PREHAB: testing the potential for predictive modeling and mapping and extending its use as a tool for evaluating management scenarios and economic valuation in the Baltic Sea. Ambio 43:82–93

78. Lindegren, M., Andersen, K.-H., Casini, M., Neuenfeldt, S. 2014. A metacommunity perspective on source-sink dynamics and management: the Baltic Sea as a case study. Ecological Applications, 24: 1820-1832.

79. Linderholm, H.W., Cardinale, M., Bartolino, V., Chen, D., Ou, T. & Svedäng, H. 2014. Influences of large- and regional-scale climate on fish recruitment in the Skagerrak-Kattegat over the last century. Journal of Marine Systems 134: 1–11

80. Lundin, M., Calamnius, L., Lunneryd, S. G., and Magnhagen, C. 2014. The efficiency of selection grids in perch pontoon traps. Fish. Res., 162: 58-63.

81. Mustamäki N, Bergström U, Ådjers K, Sevastik A, Mattila J. 2014. Pikeperch (Sander lucioperca L.) in decline - high mortality of three populations in the northern Baltic Sea. Ambio, 43: 325-336.

82. Munk, P., Cardinale, M., Casini, M. and Rudolphi, A.-C. 2014. The community structure of over-wintering larval and small juvenile fish in a large estuary. Estuarine, Coastal and Shelf Science, 139: 27-39.

83. Möllmann C, Lindegren M, Blenckner T, Bergström L, Casini M, Diekmann R, Flinkman J, Müller-Karulis, B, Neuenfeldt S, Schmidt JO, Tomczak M, Voss R, Gårdmark A. 2014. Implementing ecosystem-based fisheries management – from

single-species to integrated ecosystem assessment and advice for Baltic Sea fish stocks. ICES Journal of Marine Science. 71: 1187-1197.
84. Pacariz, S., Björk, G. & Svedäng, H. 2014. Interannual variability in transportation of fish eggs in the Kattegat and Öresund. ICES Journal of Marine Science. 71: 1706–1716.
85. Pacariz, S., Björk, G., Jonsson, P., Börjesson, P. & Svedäng, H. 2014. A model study of the large scale transport of fish eggs in the Kattegat in relation to egg density. Accepterad för publicering i ICES Journal of Marine Science. 71: 345-355.
86. Seitz RD, Wennhage H, Bergström U, Lipcius RN, Ysebaert T. 2014. Ecological value of coastal habitats for commercially and ecologically important species. ICES Journal of Marine Science 71: 648-665
87. Sundblad G, Bergström U. 2014. Increased shoreline development threatens fish reproduction. Ambio 43: 1020-1028
88. Sundblad G, Bergström U, Sandström A, Eklöv P. 2014. Nursery habitat availability limits adult stock sizes of predatory coastal fish. ICES Journal of Marine Science 71: 672-680.
89. Svedäng, H. & Hornborg, S. (2014). Selective fishing induces density-dependent growth. Nature communications doi:10.1038/ncomms5152
90. Walther, Y., and Möllmann, C. 2014. Bringing integrated ecosystem assessments to real life: a scientific framework for ICES. – ICES Journal of Marine Science, 71: 1183-1186.
91. Östman, Ö., Karlsson, O., Pönni, J., Kaljuste, O., Aho, T & Gårdmark, A. 2014. Ecosystem changes and eco-evolutionary dynamics in body size of herring (Clupea harengus) in the Bothnian Sea. Evolutionary Ecology Research, 16: 417-433.

2015

92. Aldvén, D., Degerman, E. & J. Höjesjö, 2015. Environmental cues and downstream migration of anadromous brown trout (*Salmo trutta*) and Atlantic salmon (*Salmo salar*) smolts. Boreal Environmental Research 20:35-44.
93. Bastardie F., Nielsen J.R., Eigaard O., Fock O.H., Jonsson P., Bartolino V. 2015. Competition for marine space from a Baltic cross-sector and transnational perspective: a fisheriesbio-economic DISPLACE evaluation. ICES J. Mar. Sci. 72: 824-840.
94. Bergström U, Olsson J, Casini M, Eriksson BK, Fredriksson R, Wennhage H, Appelberg M. 2015. Stickleback increase in the Baltic Sea - a thorny issue for coastal predatory fish. Estuarine and Coastal Shelf Science 163: 134-142
95. Blenckner, T., Llope, M., Möllmann, C., Voss, R., Quaas, M.F., Casini, M., Lindegren, M., Folke, C. and Stenseth, N.C. (2015). Climate and fishing steer ecosystem regeneration to uncertain economic futures. Proceedings of the Royal Society B, 282: 20142809.
96. Blomquist J., Bartolino V., Waldo S. 2015. Price premiums for providing eco-labelled seafood: evidence from MSC certified cod in Sweden. J. Agr. Econ. 66: 690-704.

97. Byström P, Bergström U, Hjältén A, Ståhl S, Jonsson D, Olsson J. 2015. Declining coastal piscivore populations in the Baltic Sea - where and when do sticklebacks matter? Ambio 44(3): 462-471.
98. Cardinale, M., Bartolino, V., Svedäng, H., Sundelöf, A. Poulsen, R. T. and Casini, M. 2015. A centurial development of the North Sea fish megafauna as reflected by the historical Swedish longlining fisheries. Fish and Fisheries, 16: 522-533.
99. Conversi, A., Blenckner, T., Dakos, V., Edwards, M., Folke, C., Gårdmark, A., Greene, C., Ling, S., Mumby, P., Casini, M. and Möllmann, C. 2015. The relevance of alternative stable states for exploited marine systems. Philosophical Transactions B, 370: 20130279.
100. Eero, M., Hjelm, J., Behrens, J., Buckmann, K., Casini, M. et al. (2015). Eastern Baltic cod in distress: an ecological puzzle hampering scientific guidance for fisheries management. ICES Journal of Marine Science, 72: 2180-2186.
101. Elfman, M., Limburg, K.E., Svedäng, H., Wickström, H. *et al*. A decade's worth of otolith pixe analyses. *International Journal of PIXE* 24: 85–100.
102. Feekings, JP, Christensen, A, Jonsson, P, Frandsen, R, Ulmestrand, M, Munch-Petersen, S & Andersen, BS 2015, 'The use of at-sea-sampling data to dissociate environmental variability in Norway lobster (Nephrops norvegicus) catches to improve resource exploitation efficiency within the Skagerrak/Kattegat trawl fishery' Fisheries Oceanography, vol 24, no. 4, pp. 383-392.,
103. Fisher, J.A.D., Casini, M., Frank, K.T., Möllmann C., Leggett, W.C. and Daskalov, G. 2015. Within-system spatial variation in drivers of exploited marine ecosystem regime shifts. Philosophical Transactions B, invited contribution, 370: 20130271.
104. Gårdmark, A., Casini, M., Huss, M., Van Leeuwen, A., Hjelm, J., Persson, L. & de Roos, A. M. 2015. Regime shifts in exploited marine food-webs: detecting mechanisms underlying alternative stable states using size-structured community dynamics theory. Philosophical Transactions Royal Society, Series B, 370 (5), 20130262. doi: 10.1098/rstb.2013.0262
105. Jokinen H, Wennhage H, Ollus V, Aro E, Norkko A. 2015. Juvenile flatfish in the northern Baltic Sea – Long term decline and potential links to habitat characteristics. Journal of Sea Research 107:67-75
106. Jokinen H, Wennhage H, Lappalainen A, Ådjers K, Rask M, Norkko A. 2015. Decline of flounder (Platichthys flesus (L.)) at the margin of the species' distribution range. Journal of Sea Research 105:1-9
107. Königson S, Fredriksson R, Strömberg P, Lunneryd S-G, Bergström U. 2015. Environmental and fisheries related effects on cod catches in a pot fishery in the Baltic Sea. ICES Journal of Marine Science, 72: 1545-1554.
108. Lill, J-O, Yvette Heimbrand, Joakim Slotte, Mikael Himberg, Ann-Britt Florin, Henry Hägerstrand. 2015. PIXE analyses of polished otoliths for identification of anadromous whitefish in the Baltic Sea. Nuclear Inst. and Methods in Physics Research, B , pp. 66-69, NIMB61255
109. Longo C., Hornborg S., Bartolino V., Tomczak M.T., Ciannelli L., Libralato S., Belgrano A. The role of trophic models and indicators in todays marine fisheries management. Mar. Ecol. Progr. Ser., 538: 257-272.
110. Lunneryd, S., Boström, M., and Aspholm, P. 2015. Sealworm (Pseudoterranova decipiens) infection in grey seals (Halichoerus grypus), cod (Gadus morhua) and shorthorn sculpin (Myoxocephalus scorpius) in the Baltic Sea. Parasitology Research, 11. 8p. 114: 257-264.

111. Ojaveer, H. Galil, B.S., Lehtiniemi, M.Christoffersen, M.,Clink, S. Florin, A.-B., Gruszka, P., Puntila, R. Behrens, J. 2015. Twenty five years of invasion: management of the round goby Neogobius melanostomus in the Baltic Sea. Management of Biological Invasions. 6: 329-339.
112. Olsson; J., Tomczak, M., Ojaveer, H., Gårdmark, A., Põllumäe, A., Müller-Karulis, B., Ustups, D., Dienesen,G., Peltonen, H., Putnis, I., Szymanek, L., Simm, M., Heikinheimo, O., Gasyukov, P., Axe. P., Bergström, L. 2015. Temporal development of coastal ecosystems in the Baltic Sea over the past two decades. ICES Journal of Marine Science. 72: 2539-2548.
113. Ozerov M.Yu., Himberg M., Aykanat T., Sendek D.S., Hägerstrand H., Verliin A., Krause T., Olsson J., Primmer C.R., and Vasemägi A. 2015. Divergent selection on gill-raker number within and between whitefish (*Coregonus lavaretus*) ecotypes in the Baltic Sea basin. Journal of Evolutionary Biology. 28: 1170–1183
114. Svedäng, H. 2015. On size selectivity and Lopt as a harvest strategy: Reply to Froese et al. (2014). *Fisheries Research* 164: 331–332.
115. Svedäng, H. & Hornborg, S. 2015. In waiting for a flourishing Baltic cod (*Gadus morhua*) fishery that never comes: old truths and new perspectives. ICES Journal of Marine Science **72**: 2197-2208.
116. van de Woolfshaar KE, Tulp I, Wennhage H .2015. Modelling population effects of juvenile offshore fish displacement towards adult habitat. Marine Ecology Progress Series 540:193-201
117. Wysujack, K., Westerberg, H., Aarestrup, K., Trautner, J., Kurwie, T., Nagel, F., & Hanel, R. 2015. The migration behaviour of European silver eels (Anguilla anguilla) released in open ocean conditions. Marine and Freshwater Research, 66(2), 145-157.

Reports

2012

1. Adill, A., Landfors, F., Mo, K. och Sevastik, A. (2012). Biologisk recipientkontroll vid Forsmarks kärnkraftverk. Årsrapport för 2011. SLU, Aqua reports 2012:7. 43s.

2. Andersson, J., Franzen, F. och Lingman, A. (2012). Biologisk recipientkontroll vid Oskarshamns kärnkraftverk. Årsrapport för 2011. SLU, Aqua reports 2012:6. 47s.

3. Backer H, Frias-Vega M (eds.) Planning the Botnian Sea. ISBN 978-952-67207-4-8 http://planbothnia.org/the-pilot-plan/

4. Bergström, L., Kautsky, L., Malm, T., Ohlsson, T., Wahlberg, M., Rosenberg, R,. Åstrand Capetillo, N. (2012) Effekter av vindkraft på marint liv i svenska havsområden. En syntesrapport. Naturvårdsverkets rapport 6488 från Vindval

5. Bergström, L., Sundqvist, F., Bergström, U. 2012. Effekter av en havsbaserad vindkraftpark på fördelningen av bottennära fisk. En studie vid Lillgrunds vindkraftpark i Öregrund. Vindval. Naturvårdsverket Rapport 6485. ISBN 978-91-620-6485-3, 37 s.

6. Bryhn, A. C., 2012. Fiskförluster i svenska kärnkraftverk. En sammanställning av kunskapsläget. Aqua Reports 2012:10. Sveriges Lantbruksuniversitet, Öregrund.

7. Fredriksson, R., Bergström, L., 2012. Utvärdering av metoder för miljöövervakning av kustfisk i relation till biogeografisk uppföljning samt utveckling av metoder för övervakning av typiska fiskarter. Rapport till Artdatabanken 2012-10-31

8. Havs- och vattenmyndigheten. 2012. (Red. Söderberg, K.). Faktablad från integrerad kustfiskövervakning i Bottniska viken, 2012. Holmön 1989-2011. 20 s. http://www.slu.se/sv/fakulteter/nl-fakulteten/om-fakulteten/institutioner/akvatiska-resurser/miljoanalys/datainsamling/provfiske-vid-kusten/provfiske-faktablad/

9. Havs- och vattenmyndigheten. 2012. (Red. Söderberg, K.).. Faktablad från integrerad kustfiskövervakning i Egentliga Östersjön, 2012. Kvädöfjärden 1988-2011. 22 s. http://www.slu.se/sv/fakulteter/nl-fakulteten/om-fakulteten/institutioner/akvatiska-resurser/miljoanalys/datainsamling/provfiske-vid-kusten/provfiske-faktablad/

10. Havs- och vattenmyndigheten. 2012. (Red. Söderberg, K.). Faktablad från integrerad kustfiskövervakning i Västerhavet, 2012. Fjällbacka 1989-2011. 17 s. http://www.slu.se/sv/fakulteter/nl-fakulteten/om-fakulteten/institutioner/akvatiska-resurser/miljoanalys/datainsamling/provfiske-vid-kusten/provfiske-faktablad/

11. Havs- och vattenmyndigheten. 2012. (Red. Söderberg, K.). Resultatblad från integrerad kustfiskövervakning i egentliga Östersjön, Torhamn 2002-2011. 14 s. http://www.slu.se/sv/fakulteter/nl-fakulteten/om-fakulteten/institutioner/akvatiska-resurser/miljoanalys/datainsamling/provfiske-vid-kusten/provfiske-faktablad

12. Havs- och vattenmyndigheten. 2012. God Havsmiljö 2020, Marin strategi för Nordsjön och Östersjön. Del 1. Inledande bedömning av miljötillstånd och socioekonomisk analys.

    https://www.havochvatten.se/om-oss/publikationer/publikationer/12-20-2012-god-havsmiljo-2020--marin-strategi-for-nordsjon-och-ostersjon--del-1-inledande-bedomning-av-miljotillstand-och-socioekonomisk-analys..html

13. Havs- och vattenmyndigheten. 2012. God Havsmiljö 2020, Marin strategi för Nordsjön och Östersjön Del 2. God miljöstatus och miljökvalitetsnormer. https://www.havochvatten.se/download/18.45b0847b13a1135746a10918/1350382826623/god-havsmiljo-2020-del2-reviderad-okt2012.pdf

14. HELCOM. 2012. Checklist of Baltic Sea Macro-species. Baltic Sea Environment Proceedings No. 130. Finansierat av HELCOM Plus HaV (Hotade arter). http://www.helcom.fi/publications/bsep/en_GB/bseplist/

15. HELCOM. 2012. Indicator based assessment of coastal fish community status in the Baltic Sea 2005-2009. Balt. Sea Environ. Proc. No. 131B . Authors: Bergström, L., Bergenius, M., Appelberg, M., Gårdmark, A., Olsson, J. m fl. http://www.helcom.fi/stc/files/Publications/Proceedings/bsep131.pdf

16. HELCOM, 2012. Development of a set of core indicators: Interim report of the HELCOM CORESET project. PART A. Description of the selection process.

Korpinen, S and Li Zweifeldt (eds). BSEP 129A
http://www.helcom.fi/stc/files/Publications/Proceedings/bsep129A.pdf

17. HELCOM, 2012. Development of a set of core indicators: Interim report of the HELCOM CORESET project. PART B: Descriptions of the indicators. Korpinen, S and Li Zweifeldt (eds).BSEP 129 B.
http://www.helcom.fi/stc/files/Publications/Proceedings/BSEP_129B_CORESET.pdf

18. ICES. 2012. Report of the ICES/HELCOM Working Group on Integrated Assessments of the Baltic Sea (WGIAB), 26–30 March 2012, Stockholm, Sweden. ICES CM 2012/SSGRSP:02. 178 pp.
http://www.ices.dk/reports/SSGRSP/2012/WGIAB12.pdf

19. ICES 2012. Report of the Workshop on the Evaluation of Plaice Stocks (WKPESTO). ICES WKPESTO REPORT 2012. ICES Advisory Committee. ICES CM 2012/ACOM: 32. Contributing author. 10 p.

20. ICES 2012. Report of the Stock Identification Methods Working Group (SIMWG) 2012.

21. ICES 2012. SCICOM steering group on sustainable use of ecosystems. ICES CM 2012/SSGSUE:04.

22. ICES 2012. Report of the Stock Identification Methods Working Group (SIMWG) 14 - 16 May 2012 Manchester, UK. 25 p. excl. annex

23. ICES. 2012. Report of the Baltic Fisheries Assessment Working Group 2012 (WGBFAS), 12 - 19 April 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:10. 859 pp.
http://www.ices.dk/workinggroups/ViewWorkingGroup.aspx?ID=42

24. ICES 2012. Report of the Workshop on Integrated/Multispecies Advice for Baltic Fisheries (WKMULTBAL), 6–8 March 2012, Charlottenlund, Denmark. ICES CM 2012/ACOM:43. 112 pp.
http://www.ices.dk/reports/ACOM/2012/WKMULTBAL/wkmultbal_2012.pdf

25. ICES. 2012. Report of the Baltic International Fish Survey Working Group (WGBIFS), 26–30 March 2012, Helsinki, Finland. ICES CM 2012/SSGESST:02. 531 pp.

26. ICES. 2012. Report of the Benchmark Workshop on Pelagic Stocks (WKPELA 2012), 13–17 February 2012, Copenhagen, Denmark. ICES CM 2012/ACOM:47. 572 pp.
http://www.ices.dk/reports/ACOM/2012/WKPELA2012/wkpela_2012.pdf

27. ICES. 2012. Report of the Study Group on VMS data, its storage, access and tools for analysis (SGVMS), 5-7 September 2012, Aberdeen, UK. ICES CM 2012/SSGSUE:08. 39 pp.

28. ICES 2012. Report of the study group on spatial analyses for the Baltic Sea (SGSPATIAL), 6-8 November 2012, Lysekil, Sweden. In press

29. ICES 2012. Report of the Workshop on the Value of Coastal Habitats for Exploited Species, (WKVHES), 25-29 June 2012, Copenhagen, Denmark. ICES CM 2012/SSGSUE:05. http://www.ices.dk/reports/SSGSUE/2012/WKVHES12.pdf

30. ICES, 2012. Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK) http://groupnet.ices.dk/WGNSSK2012/default.aspx>

31. ICES, 2012. NAFO/ICES *Pandalus* Assessment Group Meeting. ICES CM 2012/ACOM:14

32. ICES. 2012. Report of the Second ICES/HELCOM Workshop on Flatfish in the Baltic Sea, 19 - 23 March 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:33. 135 pp. http://www.ices.dk/workinggroups/ViewWorkingGroup.aspx?ID=610

33. ICES. 2012. Report of the Working Group on Multispecies Assessment Methods (WGSAM) , 22-26 October 2012, Venice, Italy. ICES CM 2012/SSGSUE:10. 145 pp.

34. ICES. 2012. Report of the Joint EIFAAC/ICES Working Group on Eels (WGEEL), 3–9 September 2012. Copenhagen, Denmark. ICES CM 2012/ACOM:18. 149 pp. http://ices.dk/workinggroups/ViewWorkingGroup.aspx?ID=75

35. ICES 2012. Report of the International Bottom Trawl Survey Working Group (IBTSWG). 27-30 March 2012, Lorient, France. ICES CM 2012/SSGESST:03. 152 pp.

36. ICES 2012. Report of the Working Group on Assessment of New MoU Species (WGNEW). 5-9 March 2012, Copenhagen, Denmark. ICES CM 2012/ACOM:20 260 pp

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38. ICES 2012. Report of the Working Group on Improving use of Survey Data for Assessment and Advice (WGISDAA). 10-13 January 2012, Copenhagen, Denmark. ICES CM 2012/SSGESST:18. 38 pp.

39. ICES. 2012. Report of the Study Group on Practical Implementation on Discard Sampling Plans, 18–22 June 2012, ICES HQ, Copenhagen, Denmark. ICES CM 2012/ACOM:51. 87 pp.

40. ICES. 2012. Report of the Workshop 3 on Implementing the ICES Fmsy Framework , 9-13 January 2012, ICES, Headquarters. ICES CM 2012/ACOM:39. 33 pp.

41. ICES. 2012. Report of the Workshop2 on Sexual Maturity Staging of sole, plaice, dab and flounder, 9-13 January 2012, Oostende, Belgium. ICES CM 2012/ACOM:50. 64 pp.

42. ICES. 2012. Report of the Working Group on Recreational Fisheries Surveys (WGRFS), 7 – 11 May 2012, Esporales, Spain . ICES CM 2012 / ACOM:23. 55 pp.

43. ICES. 2012. Report of the Baltic Salmon and Trout Assessment Working Group (WGBAST), 15–23 March 2012, Uppsala, Sweden. ICES CM 2012/ACOM:08. 353 pp.

44. ICES 2012. WGBAST report, 15–23 March 2012, Uppsala, Sweden. ICES CM 2012/ACOM:08. 353 pp

45. ICES. 2012. Report of the Herring Assessment Working Group for the Area South of 62 N (HAWG), 13 - 22 March 2012, Copenhagen, Denmark. ICES CM 2012/ACOM:06. 835 pp.

46. ICES. 2012. Report of the ICES-FAO Working Group on Fishing Technology and Fish Behaviour (WGFTFB), 23-27 April 2012, Lorient, France. ICES CM 2012/SSGESST:07. 206 pp.

47. ICES. 2012. Report of the Working Group on Fisheries Acoustics, Science and Tech-nology (WGFAST), 23-27 April 2012, Brest, France. ICES CM 2012/SSGESST:09. 38 pp.

48. ICES. 2012. Report of the Working Group on Elasmobranch Fishes (WGEF), 19–26 June 2012, Lisbon, Portugal. ICES CM 2012/ACOM:19. 547 pp.

49. ICES. 2012. Report of the Workshop on Eel and Salmon DCF Data (WKESDCF), 3 – 6 July 2012, ICES HQ, Copenhagen, Denmark. ICES CM / ACOM:62. 67 pp.

50. Liljenström S, Lindegarth M (eds) 2012. PREHAB – Spatial prediction of Baltic benthic habitats – Final Report. 28 pp. http://www.prehab.gu.se/digitalAssets/1373/1373772_preh

51. Lingman, A. och Fagerholm, B. (2012). Biologisk recipientkontroll vid Södra Cell Värö. Årsrapport för 2011. SLU, Aqua reports 2012:3. 22s.

52. Lövgren, J., and Cardinale, M., 2012. Assessment of the Greater weever (*Trachinus draco*) in the Kattegat using a length based pseudo-cohort analysis Institute of Marine Research, SLU AQUA for the Swedish Agency of Water and the Swedish Department of Agriculture.

53. Rudolphi, A-C., Casini, M. (2012). Expeditionsrapport BITS, februari 2012. Aqua reports 2012:14. Sveriges lantbruksuniversitet, Lysekil 14 s. http://www.slu.se/Documents/externwebben/akvatiskaresurser/Sidan%20Publikationer/Aqua%20reports%202012/Aqua%20reports%202012_14.pdf

54. Rudolphi, A-C., Casini, M. (2012). Expeditionsrapport BITS, november 2011. Aqua reports 2012:13. Sveriges lantbruksuniversitet, Lysekil 12 s. http://www.slu.se/Documents/externwebben/akvatiskaresurser/Sidan%20Publikationer/Aqua%20reports%202012/Aqua%20reports%202012_13.pdf

55. STECF 2012. Scientific, Technical and Economic Committee for Fisheries (STECF) – Assessment of Mediterranean Sea stocks – part 1 (STECF 12-19). (eds. Cardinale M., Osio C. & Charef A.). 2012. Publications Office of the European Union, Luxembourg, EUR 25602 EN, JRC 76735, 502 pp.

56. STECF 2012. Scientific, Technical and Economic Committee for Fisheries (STECF) - Assessment of Mediterranean Sea stocks (STECF 12-03). (eds Cardinale M., Rätz

H.-J. & Charef A.). 2012. Publications Office of the European Union, Luxembourg, EUR 25309 EN, JRC 70907, 404 pp.

57. STECF 2012. Scientific, Technical and Economic Committee for Fisheries (STECF) – assessment of Merluccius merluccius, Mullus barbatus, Mullus surmuletus, Boops boops, Spicara smaris/Spicara flexuosa and Nephrops norvegicus in Aegean and Ionian waters (STECF 12-21). (eds. Cardinale M. & Osio G.-C.). 2012. Publications Office of the European Union, Luxembourg, EUR 25635 EN, JRC 77177, 341 pp.

58. STECF 2012. Scientific, Technical and Economic Committee for Fisheries (STECF) – Multispecies management plans for the Baltic (STECF-12-06) (eds. Simmonds J and & Jardim E) 2012. Publications Office of the European Union, Luxembourg, EUR 25312 EN, JRC 70982, 71 pp. http://stecf.jrc.ec.europa.eu/documents/43805/291494/12-05_STECF+12-06+-+Multispecies+management+plans+Baltic_JRC70982.pdf

59. STECF 2012. Scientific, Technical and Economic Committee for Fisheries (STECF) – Opinion by written procedure - Evaluations of Slovenian and Spanish Management Plans (STECF-OWP-12-02) (eds. Cardinale M. & Doerner H.). 2012. Publications Office of the European Union, Luxembourg, EUR 25260 EN, JRC 69426, 14 pp.

60. Sköld, M, M. Vinther et al. 2012. Evaluation of closed areas in Kattegat to promote the rebuilding of the cod stock. Report to Swedish Ministry for Rural Affairs and the Danish Ministry of Food, Agriculture and Fisheries June 2012. http://www.slu.se/sv/fakulteter/nl-fakulteten/om-fakulteten/institutioner/akvatiska-resurser/nyheter-fran-akvatiska-resurser/2012/6/skyddat-omrade-bra-for-fisken-i-kattegatt/

61. SLU Aqua 2102. (Bergström, L., Nilsson, H., Werner, M., Wennhage, H., Blomqvist, M., Florin, A.-B., Jonsson, P., Lövgren, J., Olsson, J., Sköld, M). 2012. Underlag för inledande bedömning enligt havsmiljöförordningen - Ryggradslösa djur, Fisk, Främmande arter, Abrasion från trålning, Selektivt uttag av arter Uppdrag till HaV 2012-01-31.

62. SLU Aqua 2012. (Wennhage,H., Bergström,L., Fredriksson,R., Sundelöf A) 2012. Utvärdering av potentiella indikatorer för god miljöstatus hos fisk i Västerhavet i enlighet med havsmiljöförordningen och möjligheter till samordning med förslag framtagna av OSPAR och HELCOM på basen av befintlig miljöövervakning. Uppdrag till HaV 2012-09-15.

63. SLU Aqua 2012. Kustfiskövervakning i Öresund, 2012. Barsebäck, Lundåkrabukten/Lommabukten 1999-2012. http://www.slu.se/sv/fakulteter/nl-fakulteten/om-fakulteten/institutioner/akvatiska-resurser/miljoanalys/datainsamling/provfiske-vid-kusten/provfiske-faktablad

64. SLU Aqua 2012. Provfiske med nät och ryssjor i Hanöbukten hösten 2012. http://www.slu.se/sv/fakulteter/nl-fakulteten/om-fakulteten/institutioner/akvatiska-resurser/miljoanalys/datainsamling/provfiske-vid-kusten/provfiske-faktablad

65. SLU Aqua 2012. Kustfiskövervakning i Bottniska viken, 2011. Långvindsfjärden 2002-2011. http://www.slu.se/sv/fakulteter/nl-fakulteten/om-fakulteten/institutioner/akvatiska-resurser/miljoanalys/datainsamling/provfiske-vid-kusten/provfiske-faktablad

66. Strömberg, A., Lunneryd, S.G. & Fjälling A. 2012. Mellanskarven – ett problem för svenskt fiske och fiskodling. Aqua Reports 2012:1. 30 s.

67. Sundquist, F., Gustavsson, F. och Fagerholm, B. (2012). Biologisk recipientkontroll vid Ringhals kärnkraftverk. Årsrapport för 2011. SLU, Aqua reports 2012:5. 39s.

68. Ulrich, C. et al. 2012. Improving the assessment and management of the plaice stock complex between the North Sea and the Baltic Sea. ICES CM 2012/N:02

69. Vinther, M., Jonsson, P., Eero, M., Sköld, M., Cardinale, M., Lövgren, J., and Stoor-Paulsen, M., 2011. Fishing mortality of cod in the Kattegat 2007-2010, estimated from spatial and temporal overlap of stock distribution and effort data. Working Document at the ICES-STECF Workshop on Management plans 2 (ICES – WKMPROUNDMP 2011, STECF – EWG 11-07).

70. Vinther, M., Neuenfeldt, S., Eero, M., Casini, M., Sparholt, H. and Rindorf, A. (2012). Identification of potential target levels for Central Baltic Sea fishing mortalities taking multispecies interactions into account. ICES CM 2012/ K:22.

71. Øresland, V. (2012). Cod catches onboard Swedish tour boats in the Sound during 2011. Aqua reports 2012:2. Swedish University of Agricultural Sciences, Lysekil, 19 pp.

2013

72. Adill, A., Mo, K., Sevastik, S., Olsson, J., Bergström, L. (2013). Biologisk recipientkontroll vid Forsmarks kärnkraftverk - Sammanfattande resultat av undersökningar fram till år 2012.Aqua reports 2013:19. Sveriges lantbruksuniversitet, Öregrund. 69 s.
73. Andersson, J. Fredriksson, R., Bergström, L., Lawett, E. & Bergström, U. (2013). Inventering och modellering av fisk- och kräftdjurssamhället i Stigfjorden sommaren 2012. Aqua reports 2013:12. Sveriges lantbruksuniversitet, Öregrund. 40s.
74. Andersson, J., Fagerholm, B., Hällbom, M. Sundqvist, F. (2013). Biologisk recipientkontroll vid Ringhals kärnkraftverk. Årsrapport för 2012. Aqua reports 2013:3. Sveriges lantbruksuniversitet, Öregrund. 43s.
75. Andersson, J., Franzén, F., Lingman, A., och Tärnlund, S. (2013). Biologisk recipientkontroll vid Oskarshamns kärnkraftverk. Årsrapport för 2012. Aqua reports 2013:4. Sveriges lantbruksuniversitet, Öregrund. 25s.
76. Appelberg M, Bergenius M, Bergström U, Casini M, Gårdmark A, Hjelm J, Huss M, Kaljuste O, Olsson J, Sahlin U, Wennhage H, Werner M (2013) PLAN FISH: Planktivore management – linking food web dynamics to fisheries in the Baltic Sea. Slutrapport för Skarpsillsprojektet 2008-2013. 76 s + en fristående bilaga.
77. Bergenius M. (2013). A fish scale issue. Public Service Review: Europe issue 25. Pan European Networks Government 2013.

78. Bergström, L., Karlsson, M., Pihl, L. (2013) Comparison of gill nets and fyke nets for status assessment of coastal fish communities. WATERS report 2013:7.
79. Bergström L, Lagenfelt I, Sundqvist F, Andersson I, Andersson M H, Sigray P. (2013) Fiskundersökningar vid Lillgrund vindkraftpark – Slutredovisning av kontrollprogram för fisk och fiske 2002–2010. På uppdrag av Vattenfall Vindkraft AB. Havs och Vattenmyndigheten ISBN 978-91-87025-42-6, 124 sidor.
80. Bergström U 2013. Fiskefria områden kan gynna både fiske och miljö. I: Havsbruk som håller i längden. FORMAS fokuserar 21, pp. 355-372. ISBN 978-91-540-6074-0.
81. Bergström U, Sundblad G, Hansen J 2013. Kustfiskens uppväxtområden – viktiga men dåligt skyddade. Havsutsikt, 2013:2.
82. Bergström U 2013. Future fisheries. Pan European Networks Government 2013 (7), p. 205.
83. Bryhn, A.C, Bergenius, M.A.J., Gårdmark, A. 2013. Hur mycket strömming finns det? Havsutsikt, 2013:2.
84. Carstensen, J., U. Grandin, T. Balsby, A. Grimvall, K. Holmgren, M. Kahlert, B. Karlsson, M. Karlsson, D. Krause-Jensen, R. Lagergren, M. Lindegarth, L. Pihl & S. Wikström. 2013. Statistical workshop on gradient studies, Tjärnö, 30 January -1 February 2013. Deliverable 2.4-2, WATERS Report no. 2013:4, 49 p.
85. Casini, M. and Cardinale, M. (2013). Världens fiskbestånd – hållbart läge eller nära kollaps? (World fish stocks - sustainable use or close to collapse?). In ”Formas Fokuserar”, in Swedish.
86. Casini, M. (2013). SLUs forskning möjliggör en ekosystem-baserad förvaltning av Östersjöns fiskbestånd. Rädda Östersjön. Media Planet, Sept 2013
87. Florin AB. 2013. Främmande arter i Svenska hav. Yrkesfiskaren nr 11 2013
88. Florin AB och Svensson M. 2013. Hotade fiskarter i Svenska hav. Havsutsikt Nr 2, 2013
89. Frandsen, R.P., Lövgren J., Valentinsson, D., Krag, L.A., Madsen, N., Stor-Paulsen, M. 2013 : Fishing gears used in the Kattegat.:Underlag för utvärdering av det stängda området i Kattegatt DTU-AQUA & SLU Aqua 13 s
90. Fredriksson R, Bergström U & Olsson J. 2013. Riktlinjer för uppföljning av fiskevårdsåtgärder i kustmynnande våtmarker med fokus pågädda. Aqua reports 2013:7. Sveriges lantbruksuniversitet, Öregrund. 52s.
91. Grandin, U (ed). (2013). Balsby, T., Bergström, L., Carstensen, J., Ecke, F., Grandin, U., Grimvall, A., Hallstan, S., Holmgren, K., Kahlert, M. Statistical workshop on gradient studies, Uppsala, 23-25 October 2013, WATERS Report no. 2013:8. Havsmiljöinstitutet, Sweden.
92. HELCOM Baltic Sea environment Fact sheets 2013. Temporal development of Baltic coastal fish. http://www.helcom.fi/baltic-sea-trends/environment-fact-sheets/biodiversity/temporal-development-of-baltic-coastal-fish-communities-and-key-species/
93. HELCOM CORE Indicator of biodiversity. 2013. Abundance of fish key functional groups. http://helcom.fi/Core%20Indicators/HELCOM-CoreIndicator-Abundance_of_fish_key_functional_groups.pdf (J. Olsson)
94. HELCOM CORE Indicator of biodiversity. 2013. Abundance of key fish species. http://helcom.fi/Core%20Indicators/HELCOM-CoreIndicator-Abundance_of_key_fish_species.pdf (J. Olsson)

95. HELCOM. 2013. HELCOM Red List of Baltic Sea species in danger of becoming extinct. Balt. Sea Environ. Proc. No. 140. http://helcom.fi/Lists/Publications/BSEP140.pdf (AB Florin m fl)
96. Hjelm et al. 2013. Collaboration between the scientific community and the fishing sector to minimize discards in the Baltic cod fisheries. Assignment from the European commission.
97. Hjelm, J., Lövgren, J., Sköld, M., Storr-Paulsen, M., Vinther, M. 2013. Evaluation of the effect of effort redistribution and gear changes in relation to the closed areas in Kattegat. (http://www.slu.se/Documents/externwebben/akvatiska-resurser/publikationer/PM-Rapporter/Kattegat%20cod%20_2013%20evaluation.pdf)
98. Hjelm J. 2013. Katten på råttan – trofiska kaskaderi Östersjön. Havsutsikt. 2013:2.
99. Hjelm J. 2013. Kan Östersjön vara en förebild för ekosystembaserad fiskeriförvaltning? Havet 2013.
100. Hjelm J., Bergström U., Olsson J., Sahlin U. 2013. Kustpredatorer. Havet 2013.
101. Larson, N. (2013). Baltic International Acoustic Survey Report October 2012. Aqua Reports 2013:13 Sveriges Lantbruksuniversitet, Lysekil 26 s.
102. ICES IBP Her30 2013. Report of the Inter-Benchmark Protocol for Herring in Subdivision 30 (IBP Her30), 11–15 March 2013, By correspondence. ICES CM 2013/ACOM:60. 94 pp.
103. ICES HAWG 2013. Report of the Herring Assessment Working Group for the Area South of 62 N (HAWG), 12-21 March 2013, ICES Headquarters, Copenhagen. ICES CM 2013/ACOM:06.
104. ICES. 2013. Report of the second Workshop on Practical Implementation of Statistical Sound Catch Sampling Programmes, 6 - 9 November 2012, ICES Copenhagen. ICES CM 2012 / ACOM:52 71 pp.
105. ICES PGCCDBS (2013). Report of the Planning Group on Commercial Catch, Discards and Biological Sampling. 18-22 February 2013. ICES CM 2013/ACOM:49
106. ICES SCICOM steering group on sustainable use of ecosystems. ICES CM 2012/SSGSUE:03.
107. ICES SGSPATIAL 2013. Report of the study group on spatial analyses for the Baltic Sea (SGSPATIAL), 6-8 November 2012. SSGRSP:07 Ref. SCICOM and ACOM. 67 pp
108. ICES SIMWG. 2013. Report of the Stock Identification Methods Working Group (SIMWG), 12- 14 August 2013, Hamburg, Germany. ICES CM 2013/SSGSUE:03. 24 pp.
109. ICES WGBALT, 2013. Working Group Baltic Benchmark. ICES CM 2013/ACOM.
110. ICES WGBFAS, 2013. Report of the Baltic Fisheries Assessment Working Group (WGBFAS), April 2013, ICES Headquarters. ICES CM 2013/ACOM.
111. ICES WGBIFS 2013. Report of the Baltic International Fish Survey Working Group (WGBIFS), 21-25 March 2013, Tartu, Estonia. ICES CM 2013/SSGESST:08. 505 pp
112. ICES WGEEL 2013. Report of the Joint EIFAAC/ICES Working Group on Eels (WGEEL). ICES CM 2013/ACOM:18
113. ICES WGIAB (2013). Report of the ICES working group on integrated asssessment of the Baltic Sea (WGIAB) 2012. Bergström, L., and Tomczac, M. (Eds).

114. ICES WGRFS (2013). Report of the ICES Working Group on Recreational Fisheries Surveys. Strehlow, H.V. (Ed). (Öresland)
115. ICES WGSDIAA, 2013. Working Group on Improving use of Survey Data for Assessment and Advice. ICES CM 2013/ACOM.
116. ICES WKBEMIA 2013. Report of the Workshop on Benchmarking Integrated Ecosystem Assessments (WKBEMIA). 27–29 November 2012
117. ICES WKECOVER 2013. Report of the Working Group on the ICES ACOM/SCICOM Workshop on Ecosystem Overviews. 7-11 January 2013.
118. ICES WGNEW 2013. Report of the Working Group on Assessment on New MoU Species. 18-22 March 2013.ICES CM 2013/ACOM:21
119. ICES IBTSWG 2013. The report of International Bottom Trawl Survey Working Group. 8-12 April 2013. ICES CM 2013/SSGESST:10.
120. ICES WKDATR 2013. Report of the Workshop on DATRAS data Rewiew prioritaries and checking procedures. 29-31 January 2013. ICES CM 2013/SSGESST:05
121. ICES WGNSSK 2013. Report of Working Group on the assessment on Demersal stocks on North Sea and Skagerrak. 24-30 April 2013. ICES CM 2013/ACOM:13
122. ICES WKIND 2013.Report of the Workshop on DCF Indicators. 21-25 October 2013. ICES CM 2013/ ACOM:38
123. ICES SGPIDS 2013. Report of the Study Group on Practical Implementation on Discard Sampling Plans. 24-28 June 2013. ICES CM 2013/ACOM:56
124. NAFO/ICES NIPAG 2013. Pandalus Assessment Group Meeting 2013.12-19 September 2013. ICES CM 2013/ACOM:14
125. ICES WKPELA 2013. Report of the Benchmark Workshop on Pelagic stocks. 4-8 February 2013. ICES CM/ACOM:46.
126. ICES WKNEPH 2013. Report of the benchmark Workshop on *Nephrops* stocks. 25 Feb-1 March 2013. ICES CM /ACOM:45.
127. ICES WGITMO 2013. Report of the ICES Workinggroup on Introduction and Transfers on Marine Organisms. 20-22 March 2013. ICES CM 2013/ACOM :30
128. ICES WKSPRAT 2013. Report of the Benchmark Workshop of Sprat Stock. 11-15 February 2013. ICES CM 2013/ACOM:48
129. ICES WGINOSE 2013. Report of the Working Group on Integrated Assessments of the North Sea. 11-15 February. ICES CM 2013/SSGRSP:04
130. ICES WGBIODIV 2013. Report of the Working Group on Biodiversity Science. 18-22 February 2013. ICES CM 2013/ SSGEF:02
131. ICES WGMIXFISH 2013. Report of the Working Group on Mixed Fisheries Advice for the North Sea. 20-24 May 2013. ICES CM 2013/ACOM:22
132. ICES WGSAM 2013. Report of the Working Group on Multispecies Assessment Methods.
133. ICES WGECO 2013. Report of the Working Group on the Ecosystem effects of Fishing Activities. 1-8 May 2013. ICES CM 2013/ACOM:25
134. ICES WGBAST 2013. Report of the Baltic Salmon and Trout Assessment Working Group. 3-12 April 2013. ICES CM 2013/ACOM:08
135. ICES WGFAST 2013. Report of the Working Group on Fisheries Acoustics Science and Technology. 16-19 April 2013. ICES CM 2013/SSGESST:09
136. ICES WGVHES 2013. Report of the Working Group on the value of Coastal Habitats for Exploited Species. 17-21 June 2013. ICES CM 2013/SSGSUE:04

137. ICES WGPDMO 2013. Report of the Working group on Pathology and Diseases of Marine Organisms. 5-9 March 2013. ICES CM 2013/SSGHIE:03
138. ICES WGAVSG 2013. Report of the ICES – FAO Working Group on Fish Technology and Fish Behaviour. 6-10 May 2013. ICES CM 2013/SSGESST:11
139. ICES WGIPEM 2013. Report of the Working Group on Integrative Physical-Biological and ecosystem Modelling. 25 Feb-1 march 2013. ICES CM 2013/SSGSUE:01
140. ICES SGCal 2013. Report of the Study Group on Calibration on Acoustic Instruments in Fisheries Science. 20 April 2013. ICES CM 2013/SSGESST:03
141. ICES WKMSGAD 2013. Report of the Workshop on Sexual Maturity Staging of cod, whiting, haddock, saithe and hake.
142. ICES WKGMSE 2013. Report of the Workshop on Guidelines on Management Strategy Evaluations. 21-23 January 2013. ICES CM 2013/ACOM :39
143. ICES WKMSYREF 2013. Report of the Workshop to consider reference points for all stocks. 23-25 January 2013. ICES CM 2013/ACOM:37
144. Larson, N. (2013) Baltic International Acoustic Survey report, October 2012. Aqua reports 2013:13 Swedish University of Agricultural Sciences, Lysekil, 23 pp.
145. Lingman, A. (Red.) 2013. Faktablad från regional kustfiskövervakning i Bottniska viken, 2013. Gaviksfjärden 2004-2012.
146. Lingman, A. (Red.) 2013. Faktablad från regional kustfiskövervakning i Bottniska viken, 2013. Kinnbäcksfjärden 2004-2012.
147. Lingman, A. (Red.) 2013. Faktablad från regional kustfiskövervakning i Bottniska viken, 2013. Norrbyn 2002-2012.
148. Lingman, A., Fagerholm, B. och Tärnlund, S. (2013). Biologisk recipientkontroll vid Södra Cell Värö. Årsrapport för 2012. Aqua reports 2013:2. Sveriges lantbruksuniversitet, Öregrund. 25 s.
149. Lunneryd, S-G. och Königson, S. 2013 Sälsäkra fiskeredskap stärker småskaligt fiske. Rädda Östersjön. Media Planet, mars 2013.
150. Lövgren, J., Jonsson, P., Utkastförbud i Skagerack –underlag till HAV 2013 . SLU 9 s
151. Olsson, J. 2013. SLU övervakar våra akvatiska ekosystem. Rädda Östersjön. Media Planet, mars 2013.
152. Pihl, L., Bergström, L., Blomqvist, M., Karlsson, B., Rosenberg, R., Walve, J. 2013. Resultat från mätkampanj 2012: Stöd för utvärdering av kvalitetsfaktorer och indikatorer i näringsgradienter i Skagerrak och Östersjön. Rapport till Naturvårdsverket/Havs-och vattenmyndigheten, Dnr 764 – 12. http://www.waters.gu.se/digitalAssets/1452/1452031_rapport-ma--tkamp-2012.pdf
153. Red List Fish and Lamprey Species Expert Group. 2013. HELCOM Red List Species Information Sheets (SIS) Fish. Background document for the 2013 HELCOM Ministerial Meeting. 306 pages. http://helcom.fi/Documents/Ministerial2013/Associated%20documents/Background/HELCOM%20RedList%20All%20SIS_Fish.pdf (Ann-Britt Florin m fl)
154. Rindorf, A. Schmidt,J, Bogstad, B , Reeves, S., Walther , Y. Framework for Multispecies Assessment and Management A ICES/NCM Background Document. TemaNord 2013:550. ISBN 978-92-893-2584-4
155. Rudolphi, A.-C., Casini, M. (2013). Expeditionsrapport BITS, februari-mars med U/F Dana. Aqua reports 2013:11. Sveriges lantbruksuniversitet, Lysekil 16 s.

156. Rudolphi, A.-C., Casini, M. (2013). Expeditionsrapport BITS, november 2012. Aqua reports 2013:9 Sveriges lantbruksuniversitet, Lysekil 15 s.
157. Svedäng, H. 2013. Nästa steg att skydda fisken. Havsutsikt. 2013:2
158. Söderberg, K. (Red.) 2013. Faktablad från integrerad kustfiskövervakning i Bottniska viken, 2013. Holmön 1989-2012.
159. Söderberg, K. (Red.) 2013. Faktablad från integrerad kustfiskövervakning i Egentliga Östersjön, 2013. Kvädöfjärden 1988-2012.
160. Söderberg, K. (Red.) 2013. Faktablad från integrerad kustfiskövervakning i Egentliga Östersjön, 2013. Torhamn 2002-2012.
161. Söderberg, K. (Red.) 2013. Faktablad från integrerad kustfiskövervakning i Västerhavet, 2013. Fjällbacka 1989-2012.
162. Sveriges lantbruksuniversitet 2013. Faktablad från regional kustfiskövervakning i Egentliga Östersjön, 2013. Asköfjärden 2005-2012.
163. Sveriges lantbruksuniversitet. 2013. Faktablad från regional kustfiskövervakning i Bottniska viken, 2013. Långvindsfjärden 2002-2012.
164. Sveriges lantbruksuniversitet. 2013. Faktablad från regional kustfiskövervakning i Egentliga Östersjön, 2013. Lagnö 2002-2013.
165. Waldo, S., Paulrud, A., Ringdahl, K., Lövgren, J., Bergenius, M. (2013). Cod or clupeids? Economic consequences for fisheries operating in different ecosystem states. Aqua reports 2013:21. Swedish University of Agricultural Sciences, Öregrund. 35 s.
166. Vitale, F.,Rudolphi, A.-C.,Bland,B. (2013). Expeditionsrapport IBTS, Januari 2013 med U/F DANA. Aqua Reports 2013:10. Sveriges Lantbruksuniversitet, Lysekil 20 s.
167. Vitale, F.,Rudolphi, A.-C.,Bland,B. (2013). Expeditionsrapport IBTS, Augusti 2013. Aqua Reports 2013:16 Sveriges Lantbruksuniversitet, Lysekil 20 s.
168. WATERS, 2013. Mid-term report of WATERS: Waterbody Assessment Tools for Ecological Reference conditions and status in Sweden. Deliverable 1.1-2, WATERS Report no. 2013:3, 96 p. Havsmiljöinstitutet, Sweden

2014

169. Aronsson, M. Florin, A.-B. Lindelöw, Å. (2014). System och kriterier för riskbedömning av främmande arter avseende hot mot den biologiska mångfalden - pilotprojekt inom ”Miljöövervakning - främmande arter”. Rapport till Naturvårdsverket. NV-09491-13.

170. Adill, A., Heimbrand, Y., Kaljuste, O. (2014). Effekthöjningsprogrammet vid Forsmarks kärnkraftverk - Sammanfattande rapport från de tre första årens undersökningar. Aqua Reports 2014:13. Sveriges lantbruksuniversitet, Öregrund. 56 s.

171. Adill, A., Heimbrand, Y., Sevastik, A. (2014). Biologisk recipientkontroll vid Forsmarks kärnkraftverk - Årsrapport för 2013. Aqua reports 2014:5. Sveriges lantbruksuniversitet, Öregrund. 42 s.

172. Andersson, J. 2014. Kustfiskövervakning i Öresund, 2014. Barsebäck, Lundåkrabukten/Lommabukten 1999 2014

173. Andersson, J., Franzén F., Lingman A. och S. Tärnlund. (2014). Biologisk recipientkontroll vid Oskarshamns kärnkraftverk. Årsrapport för 2013. Aqua reports 2014:4. Sveriges lantbruksuniversitet, Uppsala. 80 s.

174. Cook, R., Fernandes, P., Florin, A., Lorance, P. & Nedreaas, K. (2014). Pollachius pollachius. The IUCN Red List of Threatened Species. Version 2014.3. <www.iucnredlist.org>. Downloaded on 22 December 2014.

175. Cook, R., Fernandes, P., Florin, A., Lorance, P. & Nedreaas, K. (2014). Trisopterus esmarkii. The IUCN Red List of Threatened Species. Version 2014.3. <www.iucnredlist.org>. Downloaded on 22 December 2014.x

176. Ericson, Y. 2014. Faktablad från regional kustfiskövervakning i Egentliga Östersjön. Asköfjärden 2005-2014

177. Fagerholm B., Ljungberg P., Wernbo A. (2014). Biologisk recipientkontroll vid Ringhals kärnkraftverk. Årsrapport för 2013. Aqua reports 2014:2. Sveriges lantbruksuniversitet, Uppsala. 52 s.

178. Fernandes, P., Cook, R., Florin, A., Lorance, P., Nielsen, J. & Nedreaas, K. (2014). Ciliata mustela. The IUCN Red List of Threatened Species. Version 2014.3. <www.iucnredlist.org>. Downloaded on 22 December 2014.

179. Florin, A., Lorance, P., Keskin, Ç. & Herrera, J. (2014). Liparis liparis. The IUCN Red List of Threatened Species. Version 2014.3. <www.iucnredlist.org>. Downloaded on 22 December 2014.

180. Florin, A., Lorance, P., Keskin, Ç. & Herrera, J. (2014). Liparis montagui. The IUCN Red List of Threatened Species. Version 2014.3. <www.iucnredlist.org>. Downloaded on 22 December 2014.

181. Förlin L, Larsson Å, Hanson N, Parkkonen J, Nyberg E, Faxneld S, Bignert A, Hennig Ek H, Bryhn A, Gårdmark A & Olsson J. Fokus Kvädöfjärden: Varför mår kustfisken dåligt? HAVET 2013/2104, s 26-30

182. Heimbrand, Y., Olsson, J., Odelström, A (2014) Otolitkemisk analys av gädda från tre havsvikar i Värmdö kommun. Rapport till Naturvatten i Roslagen AB

183. Hjelm J, Bergström U, Olsson J, Sahlin U (2014). Kustens rovfiskar behöver integrerad förvaltning. Havet 2014: 68-70

184. ICES (2014). Flounder in the northern Baltic Sea. Digest of the ICES May 2014 Advice. ICES popular advice. (A-B Florin)

185. ICES (2014). First Interim Report of the Working Group on Integrated Assessments of the North Sea (WGINOSE), 10-14 March 2014, ICES Headquarters, Copenhagen. ICES CM 2014/SSGRSP:05. 41 pp.

186. ICES (2014). Evaluation of Plaice Stock Identity in ICES sub-area IIIa and Adjacent Areas. SIMWG Report 15 December 2014.

187. ICES. 2014. Report of the third Workshop on Practical Implementation of Statistical Sound Catch Sampling Programmes, 19-22 November 2013, ICES HQ, Copenhagen, Denmark. ICES CM2013/ACOM:54. 109 pp.

188. ICES (2014). First Interim Report of the Stock Identification Methods Working Group (SIMWG), by correspondence. ICES CM 2014/SSGSUE:02. 31 pp. (A.-B. Florin & H. Svedäng from SLU co-authors)

189. ICES (2014). ICES WKSIBCA, 2014. Report of the Workshop on Scoping for Integrated Baltic Cod Assessment (WKSIBCA), October 2014, Gdynia Poland. ICES CM 2014/ACOM.

190. ICES (2014). Report of the Baltic Fisheries Assessment Working Group (WGBFAS), 3-10 April 2014, ICES HQ, Copenhagen, Denmark. ICES CM 2014/ACOM:10. 919 pp.

191. ICES (2014). Report of the Baltic International Fish Survey Working Group (WGBIFS), 24–28 March 2014, Gdynia, Poland. ICES CM 2014/SSGESST:13. 527 pp.

192. ICES (2014). Report of the Benchmark Workshop on Baltic Flatfish Stocks (WKBALFLAT), 27–31 January 2014, Copenhagen, Denmark. ICES CM 2014/ACOM:39. 320 pp. (M. Bergenius, M.Cardinale & A.-B. Florin co-authors from SLU)

193. ICES (2014). Second interim report of the ICES/HELCOM Working Group on Integrated Assessments of the Baltic Sea (WGIAB), 10-14 February 2014, Kiel, Germany. (Tomczak, M., Bergström, L., Möllmann, C. Eds)

194. ICES (2014). Report of the ICES workshop on identification of clupeoid larvae (WKIDCLUP) Van Damme,C and Kloppman,M . ICES CM 2014/SSGESST : 04

195. ICES (2014). Report of the Workshop on Regional Seas Commissions and Integrated Ecosystem Assessment Scoping (WKRISCO) 17-20 November 2014, ICES Headquarters, Denmark

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200. ICES (2014). Report of the Workshop on Scoping for Integrated Baltic Cod Assessment (WKSIBCA), 1–3 October 2014, Gdynia, Poland. ICES CM 2014/ACOM:62. 51 pp.

201. ICES (2014). Report of the Workshop to draft recommendations for the assessment of Descriptor D3 (WKD3R), 13-17 January 2014, Copenhagen, Denmark. ICES CM 2014/ACOM:50. 153 pp.

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203. ICES (2014) Report of the Workshop on Regional Seas Commissions and Integrated Ecosystem Assessment Scoping 17-20 November 2014 ICES Headquarters, Denmark. ICES CM 2014\SSGBENCH:01

204. ICES (2014). Second Interim Report of the Working Group on Marine Benthal and Renewable Energy Developments (WGMBRED) 25-28 March 2014 Tallinn, Estonia (Dannheim, J., and Gill, A., Eds)

205. ICES (2014). Second Interim Report of the Working Group on Spatial Fisheries Data (WGSFD), 10– 13 June 2014, ICES Headquarters, Copenhagen, Denmark. ICES CM 2014/SSGSUE:05. 102 pp. (Patrik Jonsson)

206. ICES (2014). SIMWG report 2014. SCICOM steering group on sustainable use of ecosystems. ICES CM 2014/SSGSUE:0?. Report of the Stock Identification Methods Working Group (SIMWG) 1 August 2014. 32 p. excl. Annex

207. ICES (2014). NAFO/ICES Pandalus Assesssment Group Meeting (WGNIPAG), 10-17 September 2014, Greenland institute of Natural Resources, Nuuk, Greenland. ICES CM 2014/ACOM:14.

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210. ICES (2014). The report of the International Bottom trawl Survey Working group (IBTSWG), 31 March-4 April 2014, Hamburg, Germany. ICES CM 2014/ SSGESST

211. ICES (2014). Report of the Herring Assessment Working Group for the area south of 62 (HAWG) 11-20 March 2014. ICES Headquarters, Copenhagen, Denmark. ICES CM 2014/ACOM:06.

212. ICES (2014). The report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), 30 April-7 May 2014, ICES Headquarters, Copenhagen, Denmark. ICES CM 2014/ACOM:13.

213. ICES (2014). Report of the Working group on Fisheries Acoustics, Science and technology (WGFAST), 6-9 May 2014, New Bedford, Massachusetts, USA. ICES CM 2014/SSGESST:07.

214. ICES (2014). Report of the Working Group on Mixed Fisheries Advice for the North Sea (WGMIXFISH), 26-30 May 2014, ICES Headquarters, Copenhagen, Denmark. ICES CM 2014/ACOM:22.

215. ICES (2014). Report of the Working Group on Nephrops Surveys (WGNEPS)

216. ICES (2014). Report of the Working Group on Multispecies Assessment Methods (WGSAM), October 2014, 20-24 October, London, England. ICES CM 2014/SSGSUE:XX

217. ICES (2014). Report of the Workshop on Statistical Analysis of Biological Calibration Studies (WKSABCAL), 13-18 October 2014, Lisbon, Portugal. ICES CM 2014/ACOM:35.

218. ICES (2014). Report of the ICES Working Group on Introductions and Transfers of Marine Organisms (WGITMO), 19-21 March 2014, Palanga, Lithuania. ICES CM 2014/ACOM:32.

219. ICES (2014).The report of the Working group on Commercial Catches (WGCATCH). 10-14 November, ICES Headquarters, Copenhagen, Denmark. ICES CM 2014/ACOM:

220. ICES (2014). Second Interim Report of the Working Group on Spatial Fisheries Data (WGFSD). 10-13 June 2014, ICES Headquarters, Copenhagen, Denmark. ICES CM 2014/SSGSUE:05.

221. ICES (2014). The report of the ICES/FAO Working group on Fishing Technology and Fish Behaviour (WGFTFB). 5-9 May 2014, New Bedford, USA.

222. Hällbom, M. (2014). Faktablad från regional kustfiskövervakning i Bottniska viken, 2014. Råneå 2002-2013

223. Hällbom, M. (2014). Faktablad från regional kustfiskövervakning i Bottniska viken, 2014. Kinnbäcksfjärden 2004-2013

224. Hällbom, M. (2014). Faktablad från regional kustfiskövervakning i Bottniska viken, 2014. Gaviksfjärden 2004-2013.

225. Hällbom, M. (2014). Faktablad från regional kustfiskövervakning i Bottniska viken, 2014. Norrbyn 2002-2013.

226. Lingman, A. (2014). Faktablad från regional kustfiskövervakning. Lagnö 2002-2014.

227. Ljungberg, P., Fagerholm, B. (2014). Biologisk recipientkontroll vid. Södra Cell Värö. Årsrapport för 2013. Sveriges lantbruksuniversitet. 32 s. Aqua reports 2014:3

228. Karlsson, M. (2014). Biologisk systemdokumentation: -Förklaring av biologiskt underlag till lektidsdatabasen. Publicerad i anslutning till befintlig applikation på Havs- och vattenmyndigheten.

229. Karlsson, M. (2014). Biologisk systemdokumentation: -Förklaring av temperaturunderlag till lektidsdatabasen. Publicerad i anslutning till befintlig applikation på Havs- och vattenmyndigheten.

230. Karlsson, M. (Red.) 2014. Faktablad från integrerad kustfiskövervakning i Bottniska viken, 2014. Holmön 1989-2013.

231. Karlsson, M. (Red.) 2014. Faktablad från integrerad kustfiskövervakning i Egentliga Östersjön, 2014. Kvädöfjärden 1988-2013.

232. Karlsson, M. (Red.) 2014. Faktablad från integrerad kustfiskövervakning i Egentliga Östersjön, 2014. Torhamn 2002-2013.

233. Karlsson, M. (Red.) 2014. Faktablad från integrerad kustfiskövervakning i Västerhavet, 2014. Fjällbacka 1989-2013.

234. Karlsson, M., Stabo Ragnarsson, H., Petersson, E., Carlstrand, H., Thörnqvist, S. (2014) Nationell plan för kunskapsförsörjning om fritidsfiske inom fisk-, havs- och vattenförvaltningen. Aqua reports 2014:12. (Tillsammans med SJÖAR OCH VATTENDRAG)

235. Larson, N. (2014). Baltic International Acoustic Survey report, October 2013. Aqua reports 2014:11.

236. Linders, T., Nilsson, P., Sköld, M., Edlund, G. (2014). Trålskyddsuppföljning I Koster-Väderöfjorden – Sedimentationsundersökning i Spiran. Länsstyrelsen i Västra Götaland. Rapport 2014:16. (http://www.lansstyrelsen.se/vastragotaland/SiteCollectionDocuments/Sv/publikationer/2014/2014-16.pdf)

237. Ljungberg, P., Fagerholm, B. (2014). Biologisk recipientkontroll vid Södra Cell Värö. Årsrapport för 2013. Aqua reports 2014:3. Sveriges lantbruksuniversitet, Uppsala. 32 s.

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240. Lundström, K. (2014). Pilotprojekt för undersökning av effekter av säl och skarv på fiskbestånd i Stockholms skärgård. Uppföljningsrapport- stöd till fiskerinäringen 2007-2013. Projekt inom fiskeområde. Rapport till Länsstyrelsen i Stockholms län. Jordbruksverket. 3 s.

241. Lundström, K. (2014). Pilotprojekt för undersökning av effekter av säl och skarv på fiskbestånd kring Gotland. Slutrapport till Region Gotland. Sveriges lantbruksuniversitet. 3 s.

242. Lundström, K. (2014). Gråsälens betydelse som fiskkonsument i Östersjön - Rapportering av verksamheten 2014 i Projekt 36: Effekter av säl på fiskbestånden. Rapport till Havs- och vattenmyndigheten. Sveriges lantbruksuniversitet. 3 s.

243. Lövgren . J (2014). Fångster av torsk i burfisket efter kräfta. Rapport HAV

244. Lövgren J. (2014) Självprovtagning 36 och 47 mm maska i räktrål: Delrapport Våren 2014 .WWF SLU lysekil, 10s 4s.

245. Lövgren,J Palmen, A.M, Johansson J.E. (2014). Hur påverkar en ökning av maskstorleken i räktrålar från 35 till 47 mm fångsten av räka? rapport .WWF, SLU lysekil, 10s

246. Moksnes, P.-O., Belgrano, A., Bergström, U., Casini, M., Gårdmark, A, Hjelm, J., Karlsson, A., Nilsson, J., Olsson, J., och Svedäng, H. (2014). Överfiske – en miljöfarlig aktivitet: Orsaker tillfiskbeståndens utarmning och dess konsekvenser i svenska hav.

247. Nedreaas, K., Florin, A., Cook, R., Fernandes, P. & Lorance, P. (2014). Merlangius merlangus. The IUCN Red List of Threatened Species. Version 2014.3. <www.iucnredlist.org>. Downloaded on 22 December 2014.

248. Nedreaas, K., Nielsen, J., Cook, R., Fernandes, P., Florin, A. & Lorance, P. (2014). Molva macrophthalma. The IUCN Red List of Threatened Species. Version 2014.3. <www.iucnredlist.org>. Downloaded on 22 December 2014.

249. Sköld M., M. Krysell, Å. Dagnevik, P. Ståhle, S. Sjöling, J. Lodenius, M. Bännstrand, N. Dahlström, D. Eckerdal. (2014). Nytt forskningsfartyg till SLU och SMHI. Regeringsuppdrag SLU dnr: ua.2014.2.6-884. (http://www.slu.se/Documents/externwebben/overgripande-slu-dokument/aktuellt-dok/Pressdokument/Nytt%20forskningsfartyg%20till%20SLU%20och%20SMHI_rapport_140814.pdf)

250. Sveriges lantbruksuniversitet 2014. Kustfiskövervakning i Öresund, 2013. Barsebäck, Lundåkrabukten/Lommabukten 1999-2013.

251. SLU & HaV (2014) Fiskbestånd i hav och sötvatten – Resursöversikt 2013. http://www.slu.se/sv/institutioner/akvatiska-resurser/sok-publikation/fiskbestand-och-miljo-i-hav-och-sotvatten/. (NÅGRA AV ARTERNA TILLSAMMANS MED SJÖAR OCH VATTENDRAG)

252. Faktablad resursöversikt abborre

253. Faktablad resursöversikt gös

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259. Faktablad resursöversikt ål

260. Faktablad resursöversikt lax

261. Faktablad resursöversikt öring

262. Sundblad G, Hansen J, Bergström U (2014). Värdefulla vikar behöver bättre skydd. Svealandskusten 2014: 26-28. Svealands kustvattenvårdsförbund.

263. Sundelöf, A., Svedäng, H., Wenche Emblem, A., Boije, J. & Svalheim, Ø. (2014). Changes in Marine resources in Skagerrak and Kattegat 1946 – 2012 - Catch and revenue in the post war fishery and transformation of the fleet. DIGIFISH Slutrapport. Rapport till NMR 2014.

264. Svedäng, H. & Hornborg, S. 2014. Cost of selectivity: inducing of density-dependent growth in Eastern Baltic cod (Gadus morhua). ICES CM 2014 O:05. 2 p.

265. Øresland, V. 2014. Förslag till hummerfredningsområden på naturliga hummerbottnar. Rapport till Länsstyrelsen i Västra Götalands Län, 34 s.

2015

266. Adill, A., Heimbrand, Y. (2015). Biologisk recipientkontroll vid Forsmarks kärnkraftverk - Årsrapport för 2014. Aqua reports 2015:7. Sveriges lantbruksuniversitet, Öregrund. 52 s.

267. Adill, A., Heimbrand, Y., Mo, K., Bergström, L. (2015). Undersökning av hårdbottenfauna vid Forsmarks kärnkraftverk - Metodikutveckling av artificiella substrat för övervakning av bottenfaunasamhällen på områden som saknar sediment. Aqua reports 2015:10. Sveriges lantbruksuniversitet, Öregrund. 35 s.

268. Andersson, J., Bryhn, A., Fagerholm, B., Jansson, M., Lingman, A. & Wernbo, A. (2015). Biologisk recipientkontroll vid Ringhals kärnkraftverk. Sammanfattande resultat av undersökningar fram till år 2013. Aqua reports 2015:6. Sveriges lantbruksuniversitet, Öregrund. 67 s.

269. ArtDatabanken 2015. Rödlistade arter i Sverige 2015. ArtDatabanken SLU, Uppsala

270. Ask, L., Gustavsson, T., Westerberg, H. (2015). Varför har fiskeriförvaltningen inte varit lyckosam? Institutionen för akvatiska resurser, Sveriges lantbruksuniversitet, Drottningholm. 39 s.

271. Bergström, L., Olsson, J. (2015) Coastal fish community indicators in Sweden - variation along environmental gradients. Deliverable 3.4-4, WATERS Report no. 2015:1. Havsmiljöinstitutet

272. Bergström U, Christiansen H, Florin A-B, Lunneryd S-G, André C 2015. Genetisk undersökning av torsk från Ålands hav. Projektrapport till BalticSea2020

273. Bryhn, A., Lindegarth, M., Bergström, L., Bergström, U., 2015. Ekosystemtjänster från svenska hav – status och påverkansfaktorer. Havs- och vattenmyndighetens rapport 2015:12. Havs- och vattenmyndigheten, Göteborg. https://www.havochvatten.se/download/18.3ca5456314ffdc22b9a70a15/1444140450533/rapport-2015-12-ekosystemtj%C3%A4nster-i-svenska-hav.pdf

274. Casini, M. et al. (2015). Dead zones relate to the body condition of the Baltic Sea cod. ICES CM 2015/R:21

275. Casini, M. et al. (2015). Proportion of large fish in the community (LFI - demersal and pelagic). HELCOM.

276. Casini, M. et al. (2015). Maximum Length of fish in the pelagic community (LFI offshore). HELCOM.

277. Degerman, E., Spjut, D. & B. Sers, 2015. Fisheries, status and management of Atlantic salmon stocks in Sweden: national report for 2014. Working Group on North Atlantic Salmon. Working paper 2015/3, 19 s.

278. Dekker W. and Wickstrom H. 2015 Utvärdering av målen för programmet krafttag ål rapport 2015:103, 49 pp. (in Swedish). Report published by Energiforsk AB, at

http://www.elforsk.se/Programomraden/Vattenkraft/Rapporter/?download=report&rid=2015_103_.

279. Dekker W. & Wickström H. 2015 Utvärdering av den svenska Ålförvaltningsplanen. Swedish University of Agricultural Sciences, Aqua reports 2015:15. Drottningholm.

280. Dekker, W. 2015. Assessment of the eel stock in Sweden, spring 2015. Second post-evaluation of the Swedish Eel Management Plan. Swedish University of Agricultural Sciences, Aqua reports 2015:11. Drottningholm. 93 pp.

281. Ericson, Y och Olsson, J. 2015. Faktablad – Resultat från övervakningen av kustfisk 2015:1. Kvädöfjärden (Egentliga Östersjön)1989-2014.

282. Ericson, Y., Larsson, Å., Faxneld, S., Bignert, A., Andersson, J., Danielsson, S., Hanson, N., Karlsson, M., Nyberg, E., Olsson, J., Parkkonen, J, Förlin, L. 2015. Faktablad från integrerad kustfiskövervakning 2015:2. Holmön (Bottniska viken) 1989-2014.

283. Ericson, Y., Larsson, Å., Faxneld, S., Bignert, A., Andersson, J., Danielsson, S., Hanson, N., Karlsson, M., Nyberg, E., Olsson, J., Parkkonen, J, Förlin, L. 2015. Faktablad från integrerad kustfiskövervakning 2015:3. Kvädöfjärden (Egentliga Östersjön)1988-2014.

284. Ericson, Y., Larsson, Å., Faxneld, S., Bignert, A., Andersson, J., Danielsson, S., Hanson, N., Karlsson, M., Nyberg, E., Olsson, J., Parkkonen, J, Förlin, L. 2015. Faktablad från Integrerad kustfiskövervakning 2015:4. Torhamn (södra Egentliga Östersjön) 2002-2014.

285. Ericson, Y., Larsson, Å., Faxneld, S., Bignert, A., Andersson, J., Danielsson, S., Hanson, N., Karlsson, M., Nyberg, E., Olsson, J., Parkkonen, J, Förlin, L. 2015. Faktablad från integrerad kustfiskövervakning 2015:1. Fjällbacka (Västerhavet) 1989-2014.

286. Hansson, D. & Svedäng, H. 2015. Från Newton till SMHI – Oceanografin tar form. *Havet 1888,* pp. 22-24.

287. HELCOM 2015 Abundance of coastal fish key species**.** HELCOM core indicator report. http://helcom.fi/baltic-sea-trends/indicators/abundance-of-key-coastal-fish-species

288. HELCOM 2015 Abundance of coastal fish key functional groups**.** HELCOM core indicator report. http://helcom.fi/baltic-sea-trends/indicators/abundance-of-coastal-fish-key-functional-groups/

289. HELCOM 2015. Guidelines for COASTAL FISH monitoring sampling methods of HELCOM.

http://helcom.fi/Documents/Action%20areas/Monitoring%20and%20assessment/Manuals%20and%20Guidelines/Guidelines%20for%20Coastal%20fish%20Monitoring%20of%20HELCOM.pdf

290. HELCOM 2015. Commercial catch statistics as data source of coastal fish in the Baltic Sea.

http://helcom.fi/Documents/HELCOM%20at%20work/Projects/4-4%20Commercial%20catch%20statistics%20as%20data%20source%20of%20coastal%20fish%20in%20the%20Baltic%20Sea.pdf

291. HELCOM 2015. Recreational fisheries in the Baltic Sea and availability of data.

http://helcom.fi/Documents/HELCOM%20at%20work/Projects/FISH-PRO%20II/Recreational%20fisheries%20in%20the%20Baltic%20Sea%20and%20availability%20of%20data.pdf

292. ICES (2015). Report of the ICES/HELCOM Working Group on Integrated Assessments of the Baltic Sea (WGIAB), 9-13 March 2015, Cadiz, Spain (Bergström, L., Möllmann, C., Uusitalo, L. Eds)

293. ICES (2015). Third Interim Report of the Working Group on Marine Benthal and Renewable Energy Developments (WGMBRED) 21-25 April, 2015 Oban, Scotland, United Kingdom (Dannheim, J., and Gill, A., Eds)

294. ICES (2015). Report of the Baltic Fisheries Assessment Working Group (WGBFAS), 14-21 April 2015, ICES HQ, Copenhagen, Denmark. ICES CM 2015/ACOM:10. 806 pp.

295. ICES (2015). Report of the Benchmark Workshop on Baltic Cod Stocks (WKBALTCOD), 2–6 March 2015, Rostock, Germany. ICES CM 2015/ACOM:35. 172 pp.

296. ICES (2015). Second Interim Report of the Working Group on Comparative Analyses between European Atlantic and Mediterranean marine ecosystems to move towards an Ecosystem-based Approach to Fisheries (WGCOMEDA), 5-8 May 2015, Palma de Mallorca, Spain. ICES CM 2015/SSGIEA:09. 20 pp.

297. ICES. 2015. Report of the Working Group on Recreational Fisheries Surveys (WGRFS), 1–5 June 2015, Sukarrieta, Spain. ICES CM 2015\SSGIEOM:10. 111 pp.

298. ICES. 2015. Report of the Working Group on Introductions and Transfers of Marine Organisms (WGITMO), 18–20 March 2015, Bergen, Norway. ICES CM 2015/SSGEPI:10. 195 pp.

299. ICES. 2015. WGLUMP. Report of the lumpfish working group. 12-13 May 2015. Reykjavik, Iceland.

300. ICES. 2015. Report of the Baltic Salmon and Trout Assessment Working Group (WGBAST), 23-31 March 2015, Rostock, Germany. ICES CM 2015\ACOM:08. 362 pp

301. ICES 2015. Report of the Herring Assessment Working Group for the Area South of 62ºN (HAWG), 10-19 March 2015, ICES HQ, Copenhagen, Denmark. ICES CM 2015/ACOM:06. 850 pp.

302. ICES 2015. Report of the Working Group on the Ecosystem Effects of Fishing Activities (WGECO), 8-5 April 2015, ICES HQ, Copenhagen, Denmark. ICES CM 2015/ACOM:24

303. ICES 2015. The report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), 28 April-7 May 2015, ICES Headquarters, Copenhagen, Denmark. ICES CM 2015/ACOM:13.

304. ICES WGNSSK Report 2015: Whiting in Subarea IV and Divisions VIId and IIIa.

305. ICES 2015. Report of the Working Group on Multispecies Assessment Methods (WGSAM), October 2014, 19-23 October. ICES CM 2015/SSGSUE

306. ICES 2015. The report of the Working group on Commercial Catches (WGCATCH). 9-13 November, Lisabon, Portugal. ICES CM 2015/ACOM

307. ICES 2015. Report of the Working group on Fisheries Acoustics, Science and technology (WGFAST), 29 May 2015, Nantes, France, ICES CM 2015/SSGIEOM:21.

308. ICES 2015. Report of the Planning Group on data needs for assessments and advice (PGDATA), 30 June-3 July, Lysekil, Sweden. ICES CM 2015/SSGIEOM:06.

309. ICES 2015. First Interim Report of the Working Group on Biological Parameters (WGBIOP). 7-11 September, Malaga, Spain. ICES CM 2015/SSGIEOM:08.

310. ICES 2015. NAFO/ICES Pandalus Assesssment Group Meeting (WGNIPAG), 9-16 September 2015, St John´s New Foundland, Canada. ICES CM 2014/ACOM:14.

311. ICES 2015. The report of the International Bottom trawl Survey Working group (IBTSWG), 23 -27 March 2015, Bergen, Norway. ICES CM 2015/ SSGIEOM:24

312. ICES 2015. First Interim Report of the Baltic International Fish Survey Working group (WGBIFS), 23-27 March 2015, Öregrund, Sweden. ICES CM 2015/SSGIEOM:07.

313. ICES 2015. Report of the Workshop on developing the RDB dataformat for design based sampling and estimation (WKRDB), 26-30 October 2015, Set, France. ICES CM 2015/ACOM

314. ICES 2015. Report of the Steering Committee for the Regional Database FishFrame (SC-RDB), 2-4 December 2015, Copenhagen, Denmark. ICES CM 2015/ACOM

315. ICES 2015, Report of the Working Group on the Value on Coastal Habitats for Exploited Species (WGVHES), 29 June-3 July 2015. Palermo, Italy. ICES CM 2015/SSGEPI:19.

316. ICES. 2015. First Interim Report of the Baltic International Fish Survey Working Group (WGBIFS), 23-27 March 2015, Öregrund, Sweden. ICES CM 2015/SSGIEOM:07. 724 pp.

317. ICES. 2015. Second Interim Report of the Working Group on Fisheries Acoustics, Science and Technology (WGFAST), 29 May 2015, Nantes, France. ICES CM 2015/SSGIEOM:21. 16 pp.

318. ICES. 2015. Workshop on the review of the ICES acoustic-trawl survey database design (WKIACTDB), 1.-2. October 2015, Copenhagen, Denmark. ICES CM 2015/SSGESST.

319. ICES (2015) Working group on the value of coastal habitats for exploited species (WGVHES). ICES CM2015/SSGEPI:19

320. ICES (2015) Working group on the ecosystem effects of fishing activities (WGECO). ICES CM 2015/ACOM:24

321. Franzen, F. & Andersson, J. (2015). Biologisk recipientkontroll vid Oskarshamns kärnkraftverk. Årsrapport för 2014. Aqua reports 2015:4. Sveriges lantbruksuniversitet, Öregrund. 79 s.

322. Jansson, M., Fagerholm, B. & Wernbo, A. (2015). Biologisk recipientkontroll vid Ringhals kärnkraftverk. Årsrapport för 2014. Aqua reports 2015:5. Sveriges lantbruksuniversitet, Öregrund. 50 s

323. Kaljuste O et al 2015. Biomasseskattningar av fisk i Eckarfjärden. Intern rapport SLU

324. Karlsson, M., Ragnarsson-Stabo, H., Petersson, E., Carlstrand, H., Thörnqvist, S. A national data collection framework for recreational fishing - In fisheries, sea and water management. Aqua reports 2015:16

325. Karlsson M. (Avsnitt SLU Aqua). Svenskt fritidsfiske och fisketurism 2020 - Så utvecklar vi svenskt fritidsfiske och fisketurism . Årsrapport 2014. Rapport 2015:2 Jordbruksverket. 104 s.

326. Larson, N., 2015. Baltic International Acoustic survey report October 2014. Aqua reports 2015:12. Sveriges lantbruksuniversitet, Lysekil.

327. Lingman, A. (2015). Biologisk recipientkontroll vid Södra Cell Värö. Årsrapport för 2014. Aqua reports 2015:3. Sveriges lantbruksuniversitet, Öregrund. 35 s.

328. Lind, E., Dannewitz, J., Palm, S., Romakkaniemi, A., Prestegaard, T. och Östergren, J. (2015). Genetisk struktur hos lax i Torneälven och Kalixälven – med speciellt fokus på uppvandringstid hos vuxen lax från olika delar av Torneälven. Rapport. Sveriges lantbruksuniversitet, Institutionen för akvatiska resurser. Drottningholm.

329. Lundqvist, H., Leonardsson, K., Williams, J., Östergren, J., Hellström, G,. och Forssén, Å. (2015). Summering av problematiken kring flergångslekare av Lax, havsvandrande öring och Steelhead i vildlaxförande stora flödesreglerade vattendrag. Rapport. Sveriges lantbruksuniversitet, Umeå.

330. Lunneryd SG, Ljungberg P, Ovegård M, Bernt K, Boström M. 2015. Sälmask och spiralmask i torsk och rötsimpa i svenska kustvatten. Aqua reports 2015:1. Sveriges lantbruksuniversitet, Lysekil. 23 s

331. Lövgren, J., Valentinsson, D. (2015). TAC-förordning Västerhavet 2016-torsk i Kattegatt. Rådgivningsnotat. SLU, Lysekil. 6 s

332. Nieto, A., Ralph, G.M., Comeros-Raynal, M.T., Kemp, J., Garcia Criado, M., Allen, D.J., Dulvy, N.K., Walls, R.H.L., Russell, B., Pollard, D., Garcia, S., Craig, M., Collette, B.B., Pollom, R., Biscoito, M., Labbish Chao, N., Abella, A., Afonso, P., Alvarez, H., Carpenter, K.E., Clo, S., Cook, R., Costa, M.J., Delgado, J., Dureuil, M., Ellis, J.R., Farrell, E.D., Fernandes, P., Florin, A-B., Fordham, S., Fowler, S., Gil de Sola, L., Gil Herrera, J., Goodpaster, A., Harvey, M., Heessen, H., Herler, J., Jung, A., Karmovskaya, E., Keskin, C., Knudsen, S.W., Kobyliansky, S., Kovačić, M., Lawson, J.M., Lorance, P., McCully Phillips, S., Munroe, T., Nedreaas, K., Nielsen, J., Papaconstantinou, C., Polidoro, B., Pollock, C.M., Rijnsdorp, A.D., Sayer, C., Scott, J., Serena, F., Smith-Vaniz, W.F., Soldo, A., Stump, E. and Williams, J.T. 2015. European Red List of marine fishes. Luxembourg: Publications Office of the European Union.

333. Nilsson, H.N., Valentinsson, D. (2015). Gear effects on mortality of discarded Norway lobster (Nephrops norvegicus) in Swedish fisheries. Rådgivningsnotat. SLU, Lysekil. 14 s

334. Olsson J, Lingman A, Bergström U 2015. Using catch statistics from the small scale coastal Baltic fishery for status assessment of coastal fish. Aqua reports 2015:13

335. Palm, S., Romakkaniemi, A., Dannewitz, J., Jokikokko, E., Pulkkinen, H., Pakarinen, T. och Östergren, J. (2015). Torneälvens bestånd av lax, havsöring och vandringssik – gemensamt svensk-finskt biologiskt underlag för bedömning av lämpliga fiskeregler under 2015. Rapport, Sveriges lantbruksuniversitet, institutionen för akvatiska resurser & Finska naturresursinstitutet (LUKE). 31 sidor.

336. Peckan-Hekim, Z, Gårdmark, A & Olsson J. 2015. Effects of contaminants and environmental change on physiology of perch in Kvädöfjärden. Internal report SLU

337. Pihl, Leif, Lena Bergström, Mats Blomqvist, Rutger Rosenberg, Jakob Walve, Sofia Wikström. Insamlade biologiska data i WATERS kustgradientstudie - Species by site dataset of biological response variables in selected coastal areas. Deliverable 3.5.1. WATERS Report no. 2015:2. Havsmiljöinstitutet, Sweden.

338. Ringdahl, K., Valentinsson, D. (2015). Rådgivning angående fördelning av fiskemöjligheter. Rådgivningsnotat. SLU, Lysekil. 9 s.

339. Rudolphi, A-C., Casini, M. (2014). Expeditionsrapport BITS, november med U/F Dana. Aqua reports 2014:8. Sveriges lantbruksuniversitet, Lysekil 18 p.

340. Rudolphi, A-C., Casini, M. (2015). Expeditionsrapport BITS, februari med U/F Dana. Aqua reports 2015:2. Sveriges lantbruksuniversitet, Lysekil 17 p.

341. Sköld, M., Mikael Krysell, Åke Dagnevik, Lars Thorell. 2015. Nytt forskningsfartyg till SLU och SMHI. Utredning om management av ett nytt svenskt forskningsfartyg Regeringsuppdrag SLU dnr: ua.2014.2.6-884.

342. Spjut, D. & E. Degerman, 2015. Effekter av fångstbegränsningar på spöfiskad lax. SLU Aqua report 2015:19, 29 s.

343. Svedäng, H. 2015. Fiskekrisen på 2010-talet. Idéer från 1800-talet kvar i nutida förvaltning. *Havet 1888*, pp. 26-28.

344. Svedäng, H. & Sundelöf, A. 2015. Bohuslänskt storsjöfiske söker nya fiskevatten *Havet 1888*, pp. 30-31.

345. Svedäng, H. & Sundelöf, A. 2015. Fiske och bestånd i ständig förändring. *Havet 1888*, pp. 32-34.

346. Tärnlund, S. (2015). Faktablad - Resultat från övervakningen av kustfisk 2015:2. Muskö (Egentliga Östersjön) 1992-2014. Sveriges lantbruksuniversitet, Öregrund. 20 s.

347. Ulmestrand, M., Valentinsson, D. (2015). Mått för havskräftstjärtar och ryggsköldslängd. Rådgivningsnotat. SLU, Lysekil. 4 s.

348. Valentinsson, D. Hjelm, J, Ringdahl, K. (2015). Implications of reducing Norway lobster (Nephrops norvegicus) minimum size (MLS/MCRS) in the Skagerrak and Kattegat area (IIIa). Rådgivningsnotat. SLU, Lysekil. 7 s.

349. Valentinsson, D. Hjelm, J, Ringdahl, K. (2015). Kommentarer till policydokument om fiskemöjligheter 2016 -COM(2015) 239 final. Rådgivningsnotat. SLU, Lysekil. 5 s.

350. Valentinsson, D., Ulmestrand, M. (2015). Rådgivning för havskräfta i Skagerrak och Kattegatt med anledning av landningsskyldighet, sänkt referensstorlek för bevarande och undantag för hög överlevnad. Rådgivningsnotat. SLU, Lysekil. 8 s.

351. Valentinsson, D., Nilsson, H. N. (2015). Effects of gear and season on discard survivability in three Swedish fisheries for Norway lobster (Nephrops norvegicus). Rådgivningsnotat. SLU, Lysekil. 21 s.

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354. Vitale, F., Rudolphi, A-C., Bland B., 2015. Expeditionsrapport IBTS Januari 2015 med U/F Dana. Aqua reports 2015:8. Sveriges lantbruksuniversitet, Lysekil.

355. Øresland, V. 2015. Fiskhälsa. Rappport till Havs och Vattenmyndigheten, 27 sidor

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357. Östergren, J., Dannewitz, J., Palm, S., Degerman, E., Kagervall, A. och Näslund, I. (2015). Biologiskt underlag till arbetet med Havs- och vattenmyndighetens regeringsuppdrag om förvaltning av lax och öring. Rapport från SLU-Aqua. 34 sidor.

358. Östergren, J. Lind, E., Palm, S., Tärnlund, S., Prestegaard, T. och Dannewitz, J. (2015). Stamsammansättning av lax i det svenska kustfisket 2013 & 2014 – genetisk provtagning och analys. Rapport. Sveriges lantbruksuniversitet, Institutionen för akvatiska resurser, Drottningholm. 20 s.

PhD theses

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2. Sjöberg N. B. 2015 Eel migration-results from tagging studies with relevance to management. Doktorsavhandling. Stockholms universitet, Naturvetenskapliga fakulteten, Institutionen för ekologi, miljö och botanik. ORCID-id: 0000-0002-9803-7260.

Msc thesis

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2. Axén Stålberg, L., 2015. Morfologisk variation hos skrubbskädda (Platichthys flesus). Kandidatuppsats, SLU, Inst f akvatiska resurser.

3. Blass M. 2015. Morphological variation in herring (Clupea harengus membras), spring and autumn spawners in the Bothnian Sea. Master thesis SLU Aqua, 30p, EX0732.

4. Dalman, E., 2015. Kan skillnaden i kondition hos torsk fångade med bur och garn förklaras av deras födoval? SLU, Inst f akvatiska resurser.

5. Lundgren, C., 2015. Abborre (Perca fluviatilis) växer snabbare och blir större i en varmare del av Östersjön. Masteruppsats (45 hp), SLU, Inst f akvatiska resurser.

6. Johansson, A., 2015. Kan arbetet i 8-fjordar klassas som ekosystembaserad fiskförvaltning? Kandidatuppsats, SLU, Inst f akvatiska resurser.

7. Sjölander F 2015. Social Acceptability of Marine Protected Areas – A Case Study of the Gålö No-Fishing Zone in Sweden. Master's thesis, Dept. of Aquatic Resources, SLU.

8. Willebrand, S. 2015. Habitat preference of *Neogobius Melanostomus* in the Baltic Sea. Habitat modelling of an invasive species. Department of Aquatic Resources, Uppsala Biology and Environmental Science - Bachelor's Programme Independent project

9. Öhnstedt, E., 2015. Modellering av tånglakens habitat i Östersjön. Kandidatuppsats, SLU, Inst f akvatiska resurser.

Appendix 2. Description of major activities within the programme and SLU-financed Foma projects

Major activities within the programme

DCF (Data Collection Framework)

The objective of Sweden's fisheries management and the EU common Fisheries policy is that fishing must be conducted in a sustainable manner, and should be based on scientific evaluations of the exploited stock size and development. To be able to reach the goal of sustainable fishing, there is a need for fundamental datacollection on fish and fisheries. A large part of the datacollection is carried out within the framework of EU directives, Data Collection Framework (DCF). The legislation is under revision and is planned to get in force in 2017. The current program "Swedish National Program for collection of Fisheries data 2014-2016 together with Annual Reports and legislation can be found at http://www.havochvatten.se/en/start/environmental-research/-data-collection-framework.html

The Swedish Agency for Marine and Water Management (SwAM) is the responsible Authority for the DCF in Sweden. However, the main part of the DCF work is conducted by SLU and the Department of aquatic resources, mainly within the programme ***Coastal and Sea areas***. SLU collect biological data that are later processed, analysed, and reported. This work serves as the basis for fisheries management and quota setting for commercially exploited stocks in Swedish waters.

The activity is by far the largest in the ***Coastal and Sea areas*** programme and involves all three institutes at the Department of aquatic resources. In 2015 for example, the extent of the DCF programme was 66.5 million SEK whereas the total extent of external funding of the ***Coastal and Sea areas*** program was 100 million SEK. Over the four years of the Foma programme, the DCF has constituted between 42 and 68% of the total extent of external funding of the programme.

The main activities of the DCF program are connected to open sea fish monitoring and can be summarized as follows:

Fishery independent data
Sweden is undertaking six off shore trawl surveys annually in the Baltic Sea, Kattegat and Skagerrak. The Danish R/V DANA is chartered for five of the surveys (complemented with R/V Hålabben in the Sound). For the UWTV survey (see below) a smaller vessel Asterix is used.

The main aim of the surveys is to estimate recruitment indices and abundance of the most important commercial species. The biological sampling includes collection of otoliths for age analysis in order to assess abundance by age class, in particular for the recruiting year classes in the North Sea, Skagerrak and Kattegat. Biological parameters such as length, weight, sex and maturity are also collected. The information collected is

fundamental information for the fish stock assessment but also for MSFD evaluations (Mainly Desciptors 3 and 4). The surveys are also used for collecting marine litter.

IBTS (International Bottom Trawl survey) is conducted twice annually in quarters 1 and 3 in Kattegat and Skagerrak. Each survey lasts for approximately 12 days (~50 hauls/survey). A bottom trawl is used for sampling demersal species while, only in quarter 1 a small trawl is also used at night for sampling fish larvae. The survey is conducted in accordance with the international standards. (http://datras.ices.dk/Documents/Manuals/Manuals.aspx)

BITS (Baltic International Trawl Survey) is conducted twice annually in quarters 1 and 4 in the Baltic Sea. As for the IBTS survey, a bottom trawl is used for sampling demersal species. The survey is conducted in accordance with the international standards.

BIAS (Baltic International Acoustic Survey) is conducted once a year in the Baltic Sea and the main objective of the survey is to assess clupeid resources in the Baltic Sea using hydroacoustics methods and hauls for verifying species composition.

UWTV (Underwater TV survey) has been developed as a means of estimating stock size of Nephrops from burrow densities.

In addition to this, personnel within the Foma-programme are also participating in the international herring survey Ash in Smutthavet (Northern Norway).

All Swedish survey data is stored in "Fish sample database" (SLU) and sent to ICES DATRAS database for international data storage. The surveys provide data to the relevant ICES Assessment Working Groups.

Fishery dependent monitoring
Except from the surveys described above the Department of aquatic resources also collects data on the whole catch onboard commercial fishing vessels and the landed part of the catch in harbors. Sweden is obliged to sample data from the most important fisheries based on landings, value and effort. While onboard a fishing vessel, staff the Department of aquatic resources samples the whole catch, including the part to be landed but also the part that will be discarded. Data on species- and length composition are recorded.

The data is fundamental information in the international stock assessment work, which is the basis for the biological advice about the stock size.

Within DCF, data are also collected on recreational fisheries on some species (cod and salmon), where recreational fishing might have an impact on the stock size of the targeted species.

Data quality and databases
Data quality, and the reporting of data quality has been a major theme in the revision of the DCF, and has been discussed at length by STECF, RCMs and ICES expert groups dealing with quality assurance of data collected under the DCF. The data collected is stored in databases at SLU, mainly within Fiskdata2, but also in KUL.

Contact: Maria Hansson and Joakim Hjelm, Department of aquatic resources, Institute of marine research.

Coastal fish monitoring

Coastal fish monitoring has a long tradition in Sweden in some areas dating back to the 1970's. Monitoring is undertaken using passive gears (multimesh gillnets and fyke nets), usually in late summer targeting coastal fish species preferring higher water temperatures. In some areas monitoring is undertaken during the colder part of the year hence targeting fish species with lower temperature preferences. The current program includes 17 reference areas along the Swedish coast with time-series starting in the late 1980's to early 2000's. Besides registering the catch, species and length composition, age-samples from targeted species (perch, flounder) are also obtained for age determination at SLU. The Swedish coastal fish monitoring program is part of the Baltic-wide network of coastal fish monitoring and assessment as coordinated from HELCOM (http://www.helcom.fi/helcom-at-work/projects/fish-pro), and serves as the basis for status assessments in relation to the MSFD in the Baltic Sea. In addition, the results from the programme are presented in area-wise fact sheets (http://www.slu.se/faktablad-kustfisk) as a basis for local coastal management and serve as the basis for fisheries management advice for commercially important coastal fish species such as perch, pike, pikeperch, whitefish and eel. In four of the areas in the programme, there is also monitoring of individual health status and contaminants of the fish. The program is financed by SWaM, SLU and local county boards.
Website: http://www.slu.se/en/departments/aquatic-resources/analysis/data-collection/test-fishing-in-coastal-waters-with-nets-and-fyke-nets/

In the archipelago of the Swedish west coast the off-shore trawl survey (IBTS) is complemented with a small scale trawl survey. The survey is aiming at following local coastal stocks of for example cod and other gadoids in an area where the influence of recruits from off-shore North Sea fish stocks is large. The coastal trawl survey has also been used to evaluate changes to the trawl border. Data on fish assemblage structure from the survey is additionally used to develop biodiversity indicators for the MSFD. Recently an egg survey was initiated in the fjord areas to further resolve the existence of local cod stocks by identifying the genetic structure of early stage eggs.

Contact: Jens Olsson, Department of aquatic resources, Institute of coastal research, and Håkan Wennhage, Department of aquatic resources, Institute of marine research.

Surveillance programs

Environmental impact of the nuclear power industry in Sweden has been intensively monitored, starting in the early 1960´s at some sites on the coast of the Baltic Proper. The principal undertaker of these surveillance programs has been the Institute of coastal research over the whole time-period. Impact on fish and fish communities has all the time been a major focus of these investigations. Data from reference areas is often used for comparison with data from areas affected by heated cooling water. One of these reference areas, Kvädöfjärden in southern Östergötland county, was integrated in the national program for coastal fish monitoring in the late 1980´s. In the Baltic Sea, the monitoring programs at the nuclear power plants of Forsmark and Oskarshamn provides long time series data on individual fish species and fish communities in impacted as well as non impacted areas. Response in fish to variations in water

temperature is an outcome that may be of use not only in understanding local effect in recipients but also to climate effects in general. The surveillance program at the Ringhals nuclear power plant and at the pulp mill industry of Södra Skogsägarna, Värö bruk (both at the Swedish west coast), also provides long time series on fish community information in central Kattegat, including reference areas. A specific and nationally important part of these investigations is that both programs provide information on eel recruitment to Swedish waters. The recruitment time series from the cooling water intake to Ringhals as well as at the mouth of River Viskan are the two most important sources of information on the youngest stages of recruiting eel in Sweden. Industrial monitoring in Sweden is fully financed by the industry and regional county boards are responsible for state supervision.
Website: http://www.slu.se/en/departments/aquatic-resources/analysis/data-collection/biological-recipient-monitoring-at-the-coast-fish-soft-bottom-macro-fauna-algae-and-birds/
Contact: Jan Andersson, Department of aquatic resources, Institute of coastal research.

Advice for management and monitoring of Marine Protected Areas, MPAs

Proposals for MPAs under national as well as under EU legislation are developed by the County Administrative Boards and SwAM in Sweden. The Department of aquatic resources has the principal advisory role in these processes regarding conservation targets for fish populations and their habitats and the integrity of food webs, as well as concerning ecosystem effects of fisheries and the need for regulating fisheries in planned and existing MPAs.

The department is also responsible for monitoring and evaluating the effects of a number of recently established no-take areas in Swedish waters, as part of government commission to SwAM to evaluate their use as a tool for fisheries and environmental management. In close connection to this work, we are also involved in a number of projects aiming to improve our understanding of the ecosystem effects of rebuilding fish stocks, as well as regarding the need for protecting essential fish habitats.

The international procedures of MPA management usually also involves further peer-review processes by ICES and STECF. Through participation in a number of expert groups, the Department of aquatic resources is involved in providing advice to EU, OSPAR and HELCOM regarding MPA related questions put forward by these clients.

In addition to reviewing the scientific quality of proposals, the department evaluates biological and fishery consequences of harvest strategies put forward by EU, the Swedish Government or SwAM. The work includes detailed analysis and modelling of fishing gear selectivity for different species, effort reallocation and fishing impact, and seafloor impact of bottom trawling. Examples of such processes are the series of advice and evaluations of MPA measures for the Kattegat cod stock done in collaboration with DTU-Aqua at the Technical University of Denmark.
Contact: Ulf Bergström, Department of aquatic resources, Institute of coastal research, and Mattias Sköld, Department of aquatic resources, Institute of marine research.

MSFD work

The department of Aquatic resources is the principal provider of monitoring data, indicator development and advice on fish and shellfish to support the Swedish national implementation of the MSFD, on commission by SWaM since the implementation of the program in 2012. The work supports assessment in relation to descriptors 1 (biodiversity; coastal fish, open sea fish, marine mammals), 2 (non-indigenous species), 3 (commercially exploited fish and shellfish), 4 (food webs) and 6 (sea-floor integrity). For coastal fish (mainly assessed within descriptor 1), ***Coastal and Sea areas*** chair the HELCOM group for coastal fish monitoring and assessments, HELCOM FISH PRO II, in which status assessments for coastal fish within the Baltic Sea are harmonized and coordinated. The programme also has a lead for developing of biodiversity indicators for the pelagic fish community in the Baltic Sea within HELCOM. Also, personnel are involved in developing standards and indicators for the evaluation of commercial species (fishing mortality, stock size and size/age of fish) in the North and Baltic Sea through the ICES network. Further pressure maps of trawling intensity are developed in collaboration with neighbouring countries and together with indicators of how this affects the seafloor and its biota. Finally, ***Coastal and Sea areas*** are also involved in work aiming at developing holistic status assessments across indicators and descriptors within HELCOM and OSPAR within the implementation of the MSFD.
Contact: Jens Olsson, Department of aquatic resources, Institute of coastal research, and Håkan Wennhage, Department of aquatic resources, Institute of marine research.

Top predators; seals and cormorants

Seals and cormorants are controversial predators in Swedish waters. They feed at the top of the aquatic food webs, sometimes on commercially important fish species. Increasing populations of both seals and cormorants during the last decades, and their interaction and conflict with fisherman has lead to a need of action. This activity is focused on understanding the ecological role of seals and cormorants and their potential impact on fish stocks, as well as to develop fishing gears that decrease the conflict between top predators and fishermen. For these analyses on stomach contents are examined using both traditional methods as well as new DNA based techniques. Together with information on population abundances, the total outtake by top predators on fish stocks can be estimated. The development of seal safe fishing gears is undertaken in close cooperation with fishermen by conducting experiments and using under-water video techniques. The work is focused on developing new fishing gear that limit the seals' ability to take the catch from traps and pots, carrying out scientific research into the conflict between seals and fishermen, studying ways of keeping the seals away from fishing gear, and giving advice and information to the public and the authorities on these questions. The activity is partly financed by the Program Seals and Fisheries, which aim to develop methods that can reduce the conflict between seals and fisheries.
Contact: Sven-Gunnar Lunneryd and Sara Königsson, Department of aquatic resources, Institute of coastal research.

Gear development - science-fishery partnership to mitigate by-catch and unwanted catches

For 2014-2017, the Swedish Agency for Marine and Water Management (SWAM) has commissioned SLU-Aqua to establish a secretariat to help fishermen formulate ideas and create project proposals on technical alterations to their fishing gears to potentially

solve issues in relation to the introduction of the discard ban (landing obligation), which is part of the revised EU common fisheries policy. A total of 38 million SEK government funding is available for the four years.

Fishermen and other industry representatives are invited to contact the secretariat at SLU via telephone, e-mail, website or in connection to physical meetings arranged yearly around the coastline. All ideas formulated by the fishermen are transformed into scientific project proposals by the scientists engaged in the secretariat at SLU-Aqua. The scientist carries out no initial filtering of project ideas. Finished project proposals are the presented to a steering group (at SWAM) that decides on which projects to approve. The approved projects are then put out for tender by the secretariat. All approved projects contain four phases:

1. Implementation of the gear alteration (Designing/constructing/buying and mounting) in which the fisherman is responsible.
2. Initial testing. Testing of the new design is carried out by the fisherman himself (under gear dispensation by SLU) during 1-3 months with guaranteed income (i.e. if the gear fishes bad he still gets a normal income). This is an iterative phase with close contacts between the fisherman and SLU, where changes are encouraged/ needed and the fisherman himself strictly documents changes made and catches.
3. Scientific testing. When the fisherman thinks things are optimized/ work as good as possible, SLU-personnel come aboard to make a more formal scientific evaluation (gear trial /selectivity). Here, the vessel also has guaranteed income.
4. Project evaluation. Scientists at SLU write a project report and report back to the industry and agency.

Of 22 project proposals in 2015, 7 were funded. An additional 9 projects were funded in 2014. Projects have covered many of the Swedish fisheries from large-scale pelagic trawlers, demersal trawl fisheries for cod, shrimp and Norway lobster, but also small-scale coastal fisheries using pots and traps for salmon, cod and shrimp.
The intention of the scheme is to provide a toolbox (i.e. a list of gears with different scientifically documented capabilities) for the fishermen to use under the reformed CFP/ landing obligation.
Website: http://www.slu.se/sv/institutioner/akvatiska-resurser/selektivt-fiske/
Contact: Daniel Vallentinsson, Department of aquatic resources, Institute of marine research.

Integrated Ecosystem Assessments and ecosystem based fisheries management

Researchers from the Department of Aquatic resources have provided a significant input to the national and international development of ecosystem-based management. One of the first integrated ecosystem assessment working groups within ICES (WGIAB; Working group for integrated assessments in the Baltic Sea) has been co-chaired by researchers from the department of Aquatic resources during main part of its 11 years (2006-2016; Anna Gårdmark and Lena Bergström). The working group has provided integrated trend analyses of Baltic Sea offshore and coastal ecosystems, input on environmental indicators to the fish stock assessment working groups, and developed models and framework for integrated ecosystem based management advice.

Researchers from department of Aquatic resources have also participated in ICES WGINOSE (Working Group on Integrated Assessments of the North Sea). Core participation in the working groups is financed by SWaM and additional participants from department of Aquatic resources often take part through various externally funded research projects. During recent years, the department of Aquatic resources also has a project financed by SWaM with the aim to implement an Ecosystem approach to fisheries management in a pilot coastal area on the Swedish west coast.
Contact: Lena Bergström, Department of aquatic resources, Institute of coastal research, and Håkan Wennhage, Department of aquatic resources, Institute of marine research.

Advice

The Department of aquatic resources is involved in several different processes where the core is science-based advice.

ICES
ICES is a unique organization founded in 1902 whose main objective is to increase scientific knowledge of the marine environment and its resources, and to use this knowledge to provide objective, non-political advice to the relevant national and international authorities including the European member states, the European Commission, and international organizations. ICES organization consists of more than 4,000 scientists from over 50 countries (20 member states). ICES structure with various committees and groups of experts on quality assurance in several stages is a unique organization that is unparalleled in any other environment management.

The Department of aquatic resources participate in the 60 working groups per year and devotes about a man-year per year to participate in various meetings. Personnel from the Aquatic resources are chairman in a number of ICES meetings. SLU also participates actively in the two governing committees of ICES (ACOM and SCICOM) and in SCICOM SLU is currently chairman. In addition, the department devotes almost 30 man-years in various projects internally with links to all of these meetings and collaborations. This work also forms the basis for the large international collaboration of the department, as data quality can ensure future collaboration. Department staff also contributes to meetings, which serves as the basis for next year's fishing quotas. Finally, staff from the department participates in approximately 30 different processes that produce other types of advice and management support.

Participation in the ICES work continuously reported to the Ministry and the Agency for Marine and Water Management. SLU also participates in a number of annual seminars, both nationally and internationally, where the ICES work discussed and disseminated. SLU's participation, through scientifically based processes of ICES, also contributes directly to international and national management of marine resources continuously developed eg through input to fishing quotas, the EU Marine Directive, or the development of technical measures. SLU has repeatedly helped to develop the international management of fisheries resources through science-based source.

Swedish agency for marine and water management (SWaM)
The department of Aquatic resources has a contract to assist SWaM in number of different matters concerning national and international fisheries management and CFP-related questions. The different matters include formal fisheries management questions

including fishing quotas and technical regulations but also ad hoc advice in urgent matters and assisting both SWaM and the Swedish ministry in EU processes. The department also assists in large range of expert meetings both nationally and internationally including regional fisheries management organizations (RFMO:s). Within the Institute of Marine Research there is an Advisory Group that deals with the questions from SWaM and other governmental and non-governmental bodies. This applies both environmental- and traditional fisheries management inquiries. The group's main task is to ensure that the division's advice is of as high quality as possible.

STECF
The implementation of the CFP requires the assistance of highly qualified scientific personnel, particularly in the fields of marine biology, marine ecology, fisheries science, fishing gear technology and fishery economics. For that purpose the Scientific, Technical and Economic Committee for Fisheries (STECF) was established by the EU commission. The members of STECF are nominated by the Commission depending of the competence required. Acting in co-operation with officials of the Commission the STECF committee may form internal working groups, whose meetings can also be attended by invited experts. The department of Aquatic resources presently have a post in the STECF committee and attend many (6-10) of these working groups annually.
Contact: Joakim Hjelm, Department of aquatic resources, Institute of marine research.

SLU-financed Foma projects

Fish as an indicator for environmental status (2015-2016)
The objective of the project is to produce a popular scientific report on how fish can be used to inform on the environmental status of lakes, running waters, coast and seas. The report is focused on effects of fishing, eutrophication, acidification, hazardous substances, habitat destruction and non-indigenous species, and also covers good examples of when fish monitoring and assessments has been used to detect and follow up these environmental problems. The report will be published in 2016.
Contact: Erik Degerman, Department of aquatic resources, Institute of freshwater research.

Integrated surveys (2015-2017)
The main goal of this project is to make the current monitoring at the department of Aquatic resources more efficient with the aim to enable collection of additional biological data, besides fish data, in on-going monitoring programs within ***Coastal and Sea areas***. Currently the project is developing and implementing electronic registration and automatic import of the data into the data bases. This is a first step to make the monitoring more cost-efficient and hence to allow for inclusion of additional parameters during monitoring in the future.
Contact: Mikael Ovegård, Department of aquatic resources, Institute of marine research.

Evaluation and implementation of methods for assessing status of data poor stocks (2015-2016)

The goal of this project is to evaluate and implement current methods available for assessing the status of Swedish fish and shellfish stocks that are recognised as "data limited", i.e. a modelling-based analytical stock assessment is yet not possible. With the increased demand from international management directives that yields of all commercial species, including national data-limited stocks, should be sustainably harvested by 2020, the aim of this project is highly valued. In 2015, alternative stock assessment methods have been reviewed and applied on a number of data limited stocks in Swedish waters. In 2016, the work will include analyses of additional stocks, summarize which methods are most suitable for which stocks. The results will be disseminated to SwAM and other stakeholders and will give input to the designation of management targets for nationally managed stocks in Sweden. The results from the project will also be presented in a scientific manuscript at the end of 2016.
Contact: Ann-Britt Florin, Department of aquatic resources, Institute of coastal research.

Accreditation fish monitoring (2015-2016)

In several of the monitoring programs carried out within ***Coastal and Sea areas*** there is sometimes a request from clients that the performers (SLU) of the monitoring is accredited (i.e. to increase the standard and quality control of the work). This project hence aims at getting coastal fish and lake fish monitoring accredited by the Swedish accreditation organ Swedaq. During 2015 the work has been initiated, and during 2016 the monitoring programs will be evaluated by Swedaq.
Contact: Magnus Dahlberg, Department of aquatic resources, Institute of freshwater research.

Quality assurance coastal fish data bases (2014-2015)

This project aims at making the work within ***Coastal and Sea areas*** in being data host for coastal fish quality assured in line with the standards of SLU. The work was started in 2014 and finalized in 2015.
Contact: Jens Olsson, Department of aquatic resources, Institute of coastal research.

Strategy for databases (2015-2016)

The aim of this project is to deliver a detailed plan for how to reach a cost-effective and accessible national fish database structure for nationally compiled fish data. Currently there are numerous small and diverse databases (besides the major databases) at the Department of aquatic resources and hence the ***Coastal and Sea areas*** program, for which there is a need of a common structure and future strategy. In 2015 an inventory of existing databases was carried out, and in 2016 a strategy will be developed.
Contact: Joep de Leeuw, Department of aquatic resources, Institute of freshwater research.