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5th International Conference on
Progress in Marine Conservation 2018
25 years after Rio – reflections on past development and looking ahead

03.–07. September 2018
Stralsund, Germany

Hosted by the
Federal Agency for Nature Conservation (BfN)
In cooperation with the
German Oceanographic Museum / OZEANEUM

Further information on the conference: www.bfn.de
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The challenge of marine nature conservation - BfN’s achievements and future perspectives

Beate Jessel
President of the German Federal Agency for Nature Conservation, Germany

Looking back on the last 25 years in marine conservation there have been many achievements, but also tremendous and increasing problems which have to be addressed. The presentation reflects on some achievements and successful work areas of BfN in the past quarter of a century with relevance for European and international partners and addresses current challenges in marine nature conservation.

Key steps were made in the protection of marine biodiversity and the implementation of marine protected areas, on a global level (e.g. 279 EBSAs, MPAs in almost 7% of the marine areas worldwide) as well as on a regional level (e.g. MPAs in the OSPAR marine area about 6.3%, HELCOM about 11%) and in the German EEZ (32% of the German EEZ).

Obliged to monitor various marine biodiversity parameters by numerous European Directives as well as International Conventions and Declarations, Germany runs broad monitoring programmes, among others the sediment and biotope mapping of the complete German EEZ of North and Baltic Seas. Starting with the mapping of the Natura 2000 sites over 15 years ago, meanwhile large areas of the North and Baltic Seas are recorded. Good marine monitoring is essential to enable early identification of both positive and negative trends in the natural environment and pressures to which it is exposed. Especially for harbour porpoises and sea birds, it provides a means of verifying the success and effectiveness of conservation and management measures and allows for sound Environmental Impact Assessments (EIA’s) in application procedures.

As human activities in the seas are increasing BfN is highly engaged in issues of impact assessments e.g. regarding underwater noise from offshore windfarms where key steps have been taken within the last decade (for instance noise limit of 160 db). Nevertheless the ongoing construction of windfarms and an increasing size of the windmills currently pose new challenges. Concerning species and habitats protection BfN provides successful scientific support for a variety of projects, currently for the protection and reintroduction of the European Oyster.

Marine nature conservation must strike a delicate balance between the aim of protecting and conserving marine biodiversity and the desire for sustainable, ecosystem-friendly use of the seas for the benefit of man. Therefore, a lot of ongoing challenges remain for the next years. BfN will focus on:

• Safeguarding threatened species and habitats / conserving marine biodiversity
• Establishing marine protected areas networks and effective administration and management of protected areas
• Achieving sustainable fisheries
• Avoiding or reducing negative impacts of human activities on the marine natural environment
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- Achieving good environmental status of the marine environment (according to MSFD, OSPAR, HELCOM)
- Exemplary species and habitat conservation measures
- Comprehensive monitoring of species and biotopes; marine habitat mapping

To reach these targets international engagement and cooperation is essential. Thus BfN will continue its dedicated work at many different levels for the conservation of marine biodiversity, together with its national and international partners.
Development of Marine Nature Conservation in the EU since 1992

Micheal O’Briain, Fotios Papoulias, Vedran Nikolic
Nature Protection Unit, DG Environment, European Commission, Belgium

Marine nature conservation in the EU since 1992 has been largely driven by implementation of the Habitats and Birds Directives as well as the Marine Strategy Framework Directive (MSFD), which form the environment pillar of the wider EU integrated maritime policy. All marine bird species are protected under the Birds Directive. The Habitats Directive protects a more limited number of key marine species and habitat types. Through creation of the Natura 2000 network the Directives have been the main catalyst for establishment of marine protected areas across the EU.

Whereas all Member States agreed from the outset that the Nature Directives apply to territorial waters there was a need for legal clarification confirming their application also to their exclusive economic zones (EEZ). Poor scientific knowledge, partly due to the high cost of marine surveys, also impeded early progress. There has been major improvement in understanding of the conservation status of marine habitats and species, as well as on pressures and threats, primarily as a result of surveillance and reporting under the Nature Directives and MSFD, but also from other scientific assessments such as the recent European red list for habitats, although knowledge gaps remain, particularly for the offshore environment.

A marine working group established under the Habitats Directive developed guidelines to support establishment of Natura 2000. Published in 2007, this involved clarifying legal aspects and marine habitat type definitions, developing methodologies for locating and selecting Nature 2000 sites and identifying management measures relevant to the protection and sustainable use of the sites. The Commission, assisted by the European Environment Agency, also organised a series of biogeographical seminars on a regional sea basis to evaluate the sufficiency of sites proposed by the Member States. The EU LIFE programme has also played a strategic role, including through supporting marine inventories for site identification and selection, both in relation to the Birds and Habitats Directive. This collective effort has resulted in major progress, particularly over the past 5 years, during which there has been a doubling of the marine area of the Natura 2000, which now covers 532,417 km² accounting for more than 9% of EU seas, and makes the main EU contribution to meeting international targets on MPAs.

Whereas there are still gaps in certain marine sub-regions, esp. offshore, including in relation to SPAs, the focus is increasingly shifting to designation of Special areas of Conservation and effective management and protection of all Natura 2000 sites. This requires clear definition of conservation objectives and, further to analysis of pressures and threats, development of the necessary conservation measures. Many key pressures are linked to other policy sectors and the Commission has developed guidance on the management of Natura 2000 sites as well as sectoral specific guidance (e.g. on wind energy, aquaculture, ports and estuaries etc.) which is also directly relevant to the marine environment. Guidance has also been developed to strengthen Natura 2000 integration with the
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Common Fisheries Policy (CFP), which represents one of the most important challenges for conservation in the marine environment. The MSFD provides a wider framework in which to address marine pressures and threats through programmes of measures. Marine biogeographical seminars and the marine expert group provide forums to discuss management issues, including assessing the interaction of fisheries and nature. However, there is a need to accelerate progress on fisheries management measures in marine Natura 2000 and in relation to the wider species protection provisions of the Directives. The EU Action Plan for Nature People and the Economy sets out current priorities for implementation of the Nature Directive in the marine environment, including better use of available EU funds, and, together with the work of international conventions, will inform the post 2020 EU biodiversity policy framework.
How effective are MPAs for nature conservation? – my experience and the likely outlook

Jon Day
ARC Centre of Excellence for Coral Reef Studies, James Cook University, Australia

The question posed in the title of this presentation might seem simple, but my experience would suggest otherwise. Answering this deceptively simple question turns out to be relatively complex, depending very much on definitions and upon differing perspectives or objectives.

The first dilemma is that an MPA means so many things to different people. For the purposes of my talk, I will use the IUCN definition which includes a range of types of MPA with differing objective(s) (‘A clearly defined geographical space, recognised, dedicated, and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values’).

The second dilemma is what is nature conservation? Most people would consider nature conservation to be more than just conserving a single species – yet what comprises ‘effective nature conservation’ should be discussed. Is it about maintaining biological diversity only within an MPA? Or is it more about the conservation of broad ecological systems and processes which might include the wider context?

Furthermore, we are usually trying to achieve nature conservation in an ever-changing environment. Most MPAs are not static areas occurring in isolation. Rather they are very dynamic, undergoing a huge number of changes (ecological, social, economic, political and managerial). What might be considered effective today, might be entirely ineffective in a few years’ time. And it is not that MPAs per se are failing – rather the context in which we are expecting them to thrive, survive and continue is changing. Cumulative pressures, and that includes global pressures, means that most of our MPAs, irrespective of their size, are failing to ensure ecological integrity is maintained.

This presentation will address these dilemmas, along with such complexities as:

• Establishing an MPA by itself will not achieve effective nature conservation – the fundamental need for ongoing political support and community buy-in (i.e. scientific evidence alone is not enough for effective nature conservation; this must be combined with other types of knowledge and the effective involvement of all relevant stakeholders)

• Too many MPAs are established without the means for ongoing effective management to then keep pace with the multitude of changes.

• Jurisdictional differences e.g. one government implementing a set of objectives and management arrangements in one MPA or network but a different set of rules supposedly addressing the same principles applied in an adjoining jurisdiction. Far greater levels of coordination of efforts at national, State/provincial and local levels is required (and international levels too, but that is much harder!)
• The need for a paradigm shift from isolated or even networks of MPAs to much broader marine spatial planning is required. The focus should not be just on an MPA but on the entire marine area in which MPA is embedded. We are setting ourselves up to fail if the often-quoted global target of “10% of the world’s marine area effectively managed” is our sole goal.

• Lastly, the unescapable dilemma of climate change and what it is likely to mean for our MPAs and for nature conservation.
Towards a global network of MPAs: Achievements in the EBSA process and the Global Oceans Biodiversity Initiative (GOBI)

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The biodiversity of the global oceans are unevenly distributed and marine life that use these ecosystems often migrate across vast distances. Ecologically important ocean areas occur within and beyond national jurisdictions requiring international evaluation international governance of these areas. We need a robust network of ecologically important areas and the corridors that connect them. Aichi target 11 calls for 10% of ocean areas to be protected and Aichi target 6 calls for all fish to be managed sustainably by 2020. A network of ecologically important areas can help us meet these goals. In order to identify areas ecologically important areas, the Convention on Biological Diversity has moved forward with the description of 319 Ecologically or Biologically Significant Areas (EBSAs) to date. These areas have been described through a series of regional scientific processes. These EBSAs span a range of sites including single features, collections of features, ephemeral ecosystems as well as dynamic ocean features. Three ongoing programs directed by the Global Oceans Biodiversity Initiative (GOBI) are now helping to further define important bird areas (IBAs), important marine mammal areas (IMMAs) and migratory connectivity in the oceans (MiCO). These ongoing programs will help support the identification of new EBSAs as well as the refinement and connectivity of existing EBSA networks. The development and maintenance of a robust network of international important areas will require broad scale ocean monitoring and data collection. New advances in ocean monitoring, such as Global Fishing Watch and continued development of open access data systems such as the Ocean Biogeographic Information System (OBIS) are essential for monitoring and understanding these ecosystems. Future initiatives to increase our scientific understanding of ocean ecosystems, such as the emerging UN Decade of Ocean Science for Sustainable Development should be directed to increase our knowledge needed to select and manage the growing network of important areas in our oceans.
Marine Protected Areas – Status, Management, Coherence & Surveillance

Tuesday, 4th September 2018, 14:30h

Development of High Seas MPAs in areas beyond national jurisdiction (ABNJ) and possibilities for their management

Carl Gustaf Lundin
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In the past 25 years, progress has been made in high seas protection. This presentation will give an overview of what exists, successes and the possible ways forward. Recent developments towards high seas MPAs and other types of protection that are de facto working in some regions of the world ocean will be highlighted as for example the Sargasso Sea Commission, the Pelagos sanctuary in the Mediterranean sea and MPAs in the Southern Ocean.

A brief overview of sectoral management tools such as the Vulnerable Marine Ecosystems (VMEs) of the FAO, the Areas of Particular Environmental Interest (APEI) of the International Seabed Authority and the Particularly Sensitive Sea Areas (PSSA) of the International Maritime Organisation will be given. The possible role of the World Heritage Convention in protecting marine sites in the high seas will be also discussed, based on the outcomes of the report “World Heritage in the High Seas: An Idea Whose Time Has Come” published in 2016. Ten years of the CBD process of describing Ecologically or Biologically Significant Areas (EBSAs) contributed to increase and gather knowledge about marine biodiversity in most regions of the world ocean.

The future of existing regional and sectoral organisations such as regional fisheries management organisations (RFMOs) in the light of the upcoming discussions that will take place at the UN Intergovernmental Conference (IGC) on Biodiversity Beyond National Jurisdiction (BBNJ) in New York will be discussed. This presentation will also look at the place of high seas MPAs and other Area Based Management Tools (ABMTs) in the future international legally binding instrument that will be developed under this framework, as well as at the challenges of enforcement and financing of high seas protected areas.
Already in 2002 the international community has made a commitment to establish representative networks of marine protected areas (MPAs) throughout the world’s oceans. The Plan of Implementation of the World Summit on Sustainable Development (WSSD 2002) set out the ambition to promote the conservation and management of the oceans through actions at all levels, including through the establishment of marine protected areas consistent with international law and based on scientific information, including representative networks by 2012. This ambition has subsequently been further elaborated in the context of the Convention on Biological Diversity (CBD) and reconfirmed at several high-level fora, including at the United Nations Conference on Sustainable Development (UNCSD 2012). The currently applicable internationally agreed goal in this regard has in 2010 been described in decision X/2 of the tenth Meeting of the Conference of the Parties to the CBD: by 2020, 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are to be conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures.

As this goal is global in nature, the process to establish networks of MPAs is naturally envisaged to also cover the polar region, i.e. the Arctic as well as the Southern Ocean surrounding the Antarctic continent. While the polar regions are still considered to be the marine areas least affected by human impacts, pressures are increasing, especially by form of effects related to climate change and marine pollution. Due to the prevailing extreme conditions in both the Arctic and the Southern Ocean, marine ecosystems and processes are highly sensitive to changes and further impacts from human activities are likely to have significant adverse consequences on their integrity and functionality. Conserving and protecting marine biological diversity in these regions is therefore of high importance.

Efforts towards identifying and establishing MPAs are being made both in the Arctic as well as the Southern Ocean, though corresponding processes are different due to differences in the respective governance arrangements in place for these regions. In the Southern Ocean, a systematic process to establish a network of MPAs is underway since 2011 under the auspices of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). Following the establishment in 2017 of the “Ross Sea Region MPA” - with 1.55 million square kilometers currently the world’s second largest MPA - focus is now on proposals for additional MPAs, including a proposal led by the German Government for an MPA in the Weddell Sea. In the Arctic, a framework has been agreed by the Arctic Council in 2015 for the establishment of a pan-Arctic network of MPAs. This framework aims to inform the development of MPA networks under the national jurisdiction of the Arctic States. While the principal aspects of the framework are relevant for the entire Arctic Ocean, the framework does
not pursue MPA approaches specific to Areas beyond National Jurisdiction (ABNJ). At the same time, the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic is working on the establishment of an ecologically-coherent network of MPAs, including in areas in the North-East Atlantic section of the Arctic and ABNJ of the Central Arctic Ocean. In this context, a proposal for the establishment of an “Arctic Ice High Seas MPA” has been prepared by WWF, and subsequently been supported by Germany and a number of other OSPAR Contracting Parties. However, a decision on this proposal could not been taken due to unresolved modes of cooperation between the OSPAR Commission and the Arctic Council.
In 2003, during the first joint Ministerial Meeting of the Helsinki and OSPAR Commissions, the Contracting Parties agreed on a Joint Work Programme (JWP). Its aim was to complete networks of Baltic Sea Protected Areas and OSPAR marine protected areas by 2010. These marine protected areas were to be well-managed and were intended to form an ecologically coherent network in the North-East Atlantic and the Baltic Sea. The presentation describes progress and shortcomings in achieving these goals.

The OSPAR Convention aims at the protection of the marine environment of the North-East Atlantic. It is the legislative instrument by which 15 states & the EU cooperate within the OSPAR Commission. Considerable efforts have been made to achieve the objectives of the JWP. Today, the OSPAR MPA network comprised 465 MPAs that cover almost 860,000 km² or 6.3% of the OSPAR Maritime Area. Within territorial waters MPAs cover 19.1%, in comparison to only 2.7% of EEZs. 7 MPAs in areas beyond national jurisdiction (ABNJ) have been designated so far, covering 8.9% of OSPAR ABNJ. Despite this good progress with respect to MPA number and area covered the OSPAR MPA network cannot be considered ecologically coherent yet and, in addition, there is no agreed methodology for assessing management effectiveness. Also, CBD Aichi Target 11, i.e. to protect 10% of coastal and marine waters by 2020, has only been reached partially. Thus, there are ongoing discussions within OSPAR about how to tackle these issues. Some potential solutions will be presented in the talk.

HELCOM is the governing body of the Helsinki Convention on the protection of the marine environment of the Baltic Sea. Marine protected areas are an important element for marine conservation work within HELCOM. A first suite of 62 preliminary “Coastal and Marine Baltic Sea Protected Areas” (HELCOM MPAs) dates back to 1994. Today, 176 HELCOM MPAs cover 12% of the Baltic Sea marine area including 4.7% of offshore areas in the EEZ. HELCOM Recommendation 35/1 provides the international legal framework and includes the necessary steps for the establishment of an ecologically coherent and well managed network of MPAs. The Contracting Parties to the Helsinki Convention are responsible for the national implementation of the recommendation. How well managed the MPAs are, cannot be fully judged at present. Tools how to measure management effectiveness for single MPAs as well as for the network are currently under development within HELCOM. However, 69 of the HELCOM MPAs have management plans or similar provisions in force, respectively. HELCOM assessed the ecological coherence and the completeness of the network already twice, comprehensively in 2010 and as an update in 2016. Although good progress has been made since 2003, the latest assessment shows that the network is still neither fully complete nor ecologically coherent. Within the HELCOM framework the working group for the “State of the Environment & Nature Conservation” is, inter alia, responsible for work related to MPAs.

1 former BSPAs
The SAMBAH project, which ran 2010-2015, was a great success when considering the international effort and the incredible amount of new information on harbour porpoise distribution and abundance in the Baltic Sea that resulted from the project. The project estimated the number of harbour porpoises remaining in the Baltic Proper population to 497 animals, (95% CI 80-1091), thus clearly confirming the critically endangered status of the population as listed by IUCN. Arguably, an even more important result from the project was the spatial distribution of animals over the year, since this knowledge is essential for designating relevant areas for protection of the species. The monthly distribution maps show a clear spatial separation between a Belt Sea and a Baltic Proper cluster of animals during the reproductive season in May-August, supporting the results from previous studies indicating that these are indeed separate populations. Also, the distribution of animals during the reproductive season indicates the presence of a breeding area for the Baltic Proper population south of Gotland island, mainly in Swedish waters but extending into the Polish Economic Zone.

In December 2016, after a proposal and public consultation by the County Administrative Boards (CABs) of Gotland and Kalmar, the Swedish government designated a large Natura2000 area for the Baltic Proper harbour porpoise population, based on the SAMBAH results, covering the main part of this potential breeding area. Another area in the Swedish Hanö Bight was proposed by the CAB in Blekinge, but was not designated by the government.

Currently, the management plan for the new Natura 2000 area is being developed, and stakeholder dialogue meetings are being held in cooperation between the responsible CABs and Swedish NGOs. The main threats to the harbour porpoises in the Baltic Sea are considered to be bycatch in gillnet fisheries, underwater noise and environmental contaminants. Gillnet effort in the area is quite low at present, but it is likely that some fisheries measures will be implemented through a delegated act, although the type of measures is still unclear. Measures to minimize disturbance by underwater noise include strict limitations of offshore constructions such as wind farms as well as other noise-generating activities such as sonar used for geophysical investigations. One of the busiest shipping lanes in the Baltic Sea runs through the area, but the Swedish Agency for Marine and Water Management (SwAM) has recently decided to not pursue a change of this route, despite its impact on wintering areas for seabirds on the offshore banks within the area. Lastly, the struggle to minimize effects of environmental contaminants has to be taken at a much larger spatial scale.

We believe that the management of this area is essential to the protection of the Baltic Proper harbour porpoise population, and urge everyone involved to make sure relevant management is implemented as soon as possible.
Marine Natura 2000 Sites in the German EEZ: a long road from designation towards good management

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Federal Agency for Nature Conservation (BfN), Germany

In September 2017 the German government designated 6 nature conservation areas in the German EEZ, comprising of over 10,000 km² total size. These are based on 10 Natura 2000 sites designated in 2004 in the German EEZ. The progression from Natura 2000 sites recognised by the European Commission as being of community importance towards nature conservation areas that are also protected under German federal law has taken 13 years and will be detailed in this talk.

A prerequisite for achieving favourable conservation status within Natura 2000 sites is effective management of the sites and anthropogenic activities taking place within them. BfN has developed a methodological approach to identify necessary measures to achieve conservation targets of marine protected areas. Based on this tool management plans were drafted for all nature conservation areas in the Exclusive Economic Zone (EEZ) of the German North Sea, which are currently under consultation and discussion to be finalised soon. Particularly in the EEZ, measures to be taken have to consider limited sovereign rights of the coastal state, i.e. the exclusive competence of the European Commission to regulate fisheries. As a result the management plans include the regulation of anthropogenic activities such as shipping, energy generation and mining as well as measures to strengthen species and habitats by e.g. reestablishing historically abundant species or restoring geogenic reefs. Good management of these nature conservation areas can only be achieved once management plans are in place and enforced by the competent authorities.
Conservation, fisheries and fisheries management

Wednesday, 5th September 2018, 9:00h

Good fisheries management in MPAs – experiences and advices

Callum Roberts
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From a conservation perspective, the best form of management for fisheries in marine protected areas is to have none at all. Full protection leads to rapid increases in the biomass of exploited species, creates more natural, extended population age structures, and fosters the recovery of large, old highly fecund animals leading to dramatic increases in reproduction. Habitats recover their diversity and structural complexity when protected from destructive fishing methods like bottom trawling and dredging, and from the restoration of cascading ecological effects resulting from larger populations of predators. In the Mediterranean, fully protected areas increased fish biomass on average by seven-fold compared to partially protected areas that only doubled biomass. However, it is also true that marine protected areas are most successful when they have high levels of support from stakeholders. This support is often obtained only by allowing some fishing within protected areas. Cases from around the world show that MPAs can be used to promote lower impact fishing methods, like hook and line, traps and static nets, and to relieve conflicts among competing and conflicting uses. For example, in the Mediterranean there are many good examples where core no-take areas of high conservation value are surrounded by zones limited to artisanal fishing methods. Industrial fishing is only allowed outside MPAs. Throughout Europe, however, it is common practice to allow industrial fishing – even the most damaging bottom trawling and dredging methods – inside MPAs. Generally, such practices are admitted on the mistaken belief that because the habitat has been subject to this kind of fishing in the past, it is able to cope in the future. While this is true in a narrow sense, it ignores the fact that European seas supported much greater populations of fish and far more diverse and complex bottom habitats before commercial fishing began. Conservation goals set to ‘maintain’ habitats in their present condition are therefore highly unambitious. Worse still, they have the perverse effect of mandating that habitats and species do not recover. We need to raise our ambitions for protected areas and give them the highest level of protection from fishing that can be achieved. Where that is not enough to produce any meaningful conservation benefit, we should be honest about it and not pretend that an area is an MPA when it is not.
The main **objective of the Common Fisheries Policy** (CFP, Regulation 1380/2013) is sustainable exploitation of marine resources in the long term, while conserving the marine environment and contributing to food security.

The ‘**tool box**’ of the Common Fisheries Policy allows for a wide range of measures for the conservation and sustainable exploitation of marine biological resources, e.g. multiannual plans, measures to achieve objectives of landing obligation, measures necessary for complying with environmental legislation, technical measures to increase selectivity or minimise negative impact of fishing activities on marine environment, fish stock recovery areas to contribute to the conservation of living aquatic resources and marine ecosystems.

Fisheries policy is an exclusive competence of the European Union, however the reform of the CFP in 2013 introduced a new form of governance through **regionalisation** to shape a number of measures adopted through delegated acts, in particular conservation measures needed to comply with obligations under EU environmental legislation (Nature Directives and Marine Strategy Framework Directive - MSFD) and discard plans. Where regionalisation applies, EU Member States with a direct management interest may submit joint recommendations, after consulting relevant Advisory Councils, for the adoption of delegated acts by the Commission. The joint recommendations under Article 11 CFP (to comply with environmental legislation) received so far cover the Baltic and North Sea basins. To date, there are 4 delegated acts in force.

Under the CFP, Member States are required to collect and make available the biological, environmental, technical and socioeconomic data for science-based fisheries management. The **Data Collection Framework** also requires Member States to collect data to assess the impacts of EU fisheries on marine ecosystems in EU and non-EU waters.

To help support the implementation of the CFP, the **European Maritime and Fisheries Fund** (EMFF) offers financial support to Member States to finance the protection and restoration of marine and coastal biodiversity and ecosystems.

There are number of **benefits of management measures for fishing** in Natura 2000/other MPAs and for MSFD purposes, e.g. meet the objectives of CFP and environmental legislation, ensure an appropriate balance between sustainable exploitation of resources and the need to conserve important habitats, bring together fisheries and environmental stakeholders, enhance cooperation between national administrations and stakeholders, promote regional cooperation between Member States having direct management interest in certain fisheries or areas, reinforce a role of the Advisory Councils, the consultation of which is compulsory, ensure a level playing field by preventing the...
existence of different management measures for similar marine feature within one region, shape legislation in an open and transparent way.

Some aspects for improvements need to be highlighted: enhancement of fisheries conservation measures for the protection of the marine environment and need for further work in the Mediterranean and Atlantic seabasins, improved collection of biological data for better scientific assessment for enhanced fisheries management, and a better uptake of available funds by Member States in implementing their EMFF programmes.
Brackish water of a species-poor ecosystem of the Baltic Sea is inhabited by four native species of marine mammals: three representatives of seals and one of cetacean. A grey seal and a harbor porpoise are selected to illustrate the complexity of problems with fisheries interaction. Both species are protected by international and national law although managed under different legislations and using diverse conservation measures in each country. Baltic grey seal population has been recovering since the 1980s after experiencing a severe depletion caused by extensive hunting and environmental contaminants. The growth of the population was observed only in the northern Baltic until the beginning of 2000s. In order to facilitate the recovery of grey seals to the southern Baltic, several projects of species reintroduction have been implemented in Sweden, Lithuania and Poland. The first seal haul-out in Polish waters was identified in 2014 and remains the only such place until today occupied occasionally by up to 300 individuals. The total counted number of Baltic grey seal was about 30,000 in 2015 and so far no growth has been observed. A harbour porpoise Baltic population estimated at about 500 individuals in 2014 remains critically endangered since 2008 according to IUCN categories. Outside the summer breeding season the population is dispersed and uses the coastal areas preferably in the southern Baltic. For both species fishery is considered a serious human induced threat mainly responsible for accidental mortality in fishing nets. Marine mammals, in turn, are seen as competitors for natural fish resources, and grey seals additionally as “pests” that damage fish catch and gears. Interactions between marine mammals and fishery although significantly different in the case of each species lead to a conflict between conservation and economic interest of coastal fishermen. Despite of numerous agreements and commitments, no measures considered urgent and given highest priority to protect depleted harbour porpoises population from by-catch have been implemented in the Baltic. In the case of grey seals, after over 20 years of successful conservation, despite implementing several measures to reduce the seal damage including the resumption of hunting, the conflict could not be solved and it moved also to the southern Baltic along with the spreading seals. During last years in Poland the number of stranded animals and cases of illegal intentional killing as well as cases of inflicting severe injuries on the animals increased significantly from tens to over 200 per year. This situation heavily involved the public, which became an active part of the dispute opposing the killing of seal. It may turn out that whether the Baltic seal-fishery conflict will be resolved for the benefit of each sides will depend not only on the legally established measures, but also the individual consumers choices.
The role of gear technology to support sustainable fishing in the North and Baltic Seas

Christopher Zimmermann
Thünen Institute of Baltic Sea Fisheries, Germany

The use of marine living resources, e.g. for human consumption, usually comes with an unavoidable and mostly negative influence on the environment, such as unwanted bycatch of target or non-target species, or mechanical impact on the sea floor. To ensure a sustainable exploitation, this impact should be minimised as far as possible. Technical solutions, such as gear modifications, usually provide the least disruptive approach for such a minimisation and are therefore usually easier to implement compared to behavioural changes or closures. The gear technology group of the Thünen Institute of Baltic Sea Fisheries currently conducts different workstreams to:

- improve species and size selectivity of trawls, using morphology and behaviour of the species especially those caught together in a mixed fisheries
- reduce the impact of bottom trawls on the seafloor (and at the same time improve energy efficiency and release of plastic debris)
- develop modified gill nets and alternative gear to reduce the bycatch of seabirds and marine mammals in passive fisheries.

The group uses a systematic approach aiming at providing tailored, cost-efficient solutions for specific fisheries. Contrary to our expectations, most of the gear in use can be improved significantly, although some of them should have undergone an evolution over many decades. The prerequisites for this research are ideas, a good cooperation with fishers and some newer technology, such as action cameras which allow to evaluate the impact of incremental modifications quickly. The most important prerequisite for the implementation of environmentally friendly fishing gear however is a consistent setting of right incentives.
The integrated LIFE project INTEMARES aims to achieve a consolidated network of Natura 2000 marine areas, managed in an efficient and integrated manner, with the active participation of the sectors involved and with research as basic tool for decision making. Coordinated by the Ministry for the Ecological Transition through the Biodiversity Foundation, it includes a scientific partner (the Spanish Institute of Oceanography), two conservation organization partners (WWF-Spain and SEO/BirdLife), a fishing organization partner (the Spanish Fishing Confederation CEPESCA) and the proper Natura 2000 management competent authority of the Ministry (General Directorate for the Sustainability of Coast and Seas). It also has the support of the National Federation of Fishermen Guilds.

It also aims to implement the Prioritized Action Framework for Natura 2000 Network in Spain, the targeted plan of this integrated project, which in accordance to Article 8 of the European Union Habitats Directive, sets the objectives, measures and funding sources necessary for the maintenance or restoration of a favorable conservation status of habitats and species present in the Natura 2000 network, both on land and in the ocean. The proper management of the Natura 2000 network is fundamental to address a series of European directives and international conventions. It helps to effectively implement the Habitats and Birds Directives, to address and diversify its funding, and to integrate territorial (national/regional) and sectorial policies. It is clearly linked with the implementation of the Marine Strategy Framework Directive, contributing to achieve the “good environmental status” of marine waters; the Maritime Spatial Planning Directive; the connection with the Water Framework Directive; and the implementation of EU legislation on nature conservation. It also contributes to the Convention on Biological Diversity target: by 2020, 10% of coastal and marine areas will be conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas; and to fulfil Spain’s other environment-related international obligations (Barcelona, OSPAR and Bern Conventions, among others).

Fishing is among the human uses with the greatest impact on the Natura 2000 marine network. To address it properly within the framework of the project three main approaches are considered. First, the active involvement of fishing authorities, the fishing sector and all related stakeholders since initial stages of the project conception. Second, the establishment of adequate measures concerning fisheries in the Management Plans that will be drawn up for the Natura 2000 marine sites in order to make the activity compatible with the conservation objectives set in the management plans, and based on the best available scientific information. And third, the implementation of projects to increase sustainability of fisheries in the framework of the European Maritime and Fisheries Fund (EMFF), which are part of the complementary measures within the integrated project.
Conservation, fisheries and fisheries management

The actions, which will run from 2017 to 2024, have a total budget of 49.8 million euros, of which 27.3 million correspond to the LIFE program, 10.3 million to the European Social Fund and 11 million to the European Maritime and Fisheries Fund. It includes 50 actions to be implemented over the next 8 years on more than 8 million marine hectares including research, biodiversity conservation, mitigation of impacts, governance and participation and environmental education, environmental awareness and communication. Among these actions are several whose objective is to improve national, regional and international coordination for the fulfillment of the objectives of the project. The project has a national geographical scope, thus including direct actions in the Spanish Natura 2000 network of marine sites in all biogeographical regions, includes cross border coordination mechanisms with neighbor countries and has an important demonstration character.
Conservation, fisheries and fisheries management

Wednesday, 5th September 2018, 12:30h

Fisheries management and MPAs in the marine waters of the Balearic islands

Francesc Rosello Ripoll
Service of Fisheries management of the Balearic Government, Spain

The presentation will consist basically on the explanation of a case of Co-management governance, particularly of the boat seine fishery for Goby.

We will try to shortly explain how we got to successfully manage this fishery with full cooperation from the fishermen, the benefits we all obtained from it and the importance and relevance of this way of management.

We’ll explain as well the measures which help us maintain the fishery in very healthy and historic levels, the opinion of the fisherman and the future steps we want to give.

To finish the presentation we’ll make a short overview about the current MPA situation around the Balearic Islands, what’s approved, what’s going to be approved soon, and what’s under consideration.
Further impacts of human activities

Thursday, 6th September 2018, 9:00h

Protecting Canada’s Oceans: Recognizing and mitigating risks posed to Canada’s marine environment

Kate Ladell
Department of Fisheries and Oceans, Canada

Meeting Canada’s international commitment to protect 10% of marine and coastal areas by 2020 is a priority for the Government of Canada. As of June 30, 2018, Canada has conserved 7.9% of marine and coastal areas, up from approximately 1% in 2015. Several tools are used by multiple Federal, Provincial, Territorial and Indigenous groups to protect Canada’s oceans, with the Department of Fisheries & Oceans responsible for the designation of Oceans Act Marine Protected Areas (MPAs). Oceans Act MPAs can be designated for the purposes of:

1. commercial and non-commercial fishery resources & their habitats;
2. marine mammals & their habitats;
3. endangered or threatened marine species & their habitats;
4. unique habitats;
5. areas of high biological productivity or biodiversity; and,
6. any other marine resource or habitat as is necessary to fulfil the mandate of the Minister.

All Oceans Act MPA Regulations include general prohibitions for any activity that disturbs, damages, destroys or removes from the MPA any living marine organism or any part of its habitat or is likely to do so. If human activities are allowed to occur within the boundaries of MPAs, exceptions to the general prohibition must be articulated in the MPA Regulations. Whether an activity is allowed to occur within an Oceans Act MPA depends on legal requirements, treaty rights of Indigenous Peoples, international agreements, and the risk posed by the human activities on the conservation objectives. This presentation will describe how the Department of Fisheries and Oceans has applied a risk-based approach to Oceans Act MPA establishment, the challenges and benefits associated with this approach, and identify tools under development to ensure rigour and consistency when evaluating and mitigating risks caused by human activities.
Further impacts of human activities

Thursday, 6th September 2018, 9:40h

Possible risks of new technologies – application of drones in the Antarctic and its effects on penguins

Osama Mustafa & Marie-Charlott Rümmler
Thüringer Institut für Nachhaltigkeit und Klimaschutz, Germany

The personal, commercial, and scientific use of drones in Antarctica has increased dramatically in recent years. Due to the potential benefits for, and negative impacts to, sensitive Antarctic wildlife, the use of drones is a widely discussed topic. Guidelines are under development but decision makers are still calling for a more profound knowledge on the magnitude of disturbance caused on wildlife by drones.

To fill this gap we assessed the sensitivity of different bird species in the Maritime Antarctic to various flight activities at a colony in the Maritime Antarctic. As an example we present a study on the behavior of Adélie and Gentoo Penguins altered by drone flights.

The behavioral reactions were more pronounced when the drone was flown at lower altitudes. In Adélie penguins, behavioral reactions caused by the drone were evident at the highest tested altitude of 50 m, while in Gentoo penguins reactions were evident from 30 m downwards. For both species, the reactions increased markedly when the drone was flown at low altitudes of 10 – 20 m. Gentoo penguins showed significant reactions when the drone was launched at distances closer than 20 m. There was some evidence of habituation to the drone at some altitudes for horizontal flights, but no evidence of habituation in vertical flights.

Apart from this study we present further approaches to evaluate the impact of drones to wildlife and discuss the advantages and challenges of drone use for scientific purposes in the Antarctic.
Further impacts of human activities

Thursday, 6th September 2018, 10:00h

Impacts of offshore windfarms on seabirds

Stefan Garthe, Verena Peschko, Henriette Schwemmer, Sabine Müller, Nele Markones
Research and Technology Centre (FTZ), Kiel University, Germany

The establishment of windfarms at sea has raised a variety of concerns about possible impacts on wildlife, mostly so for marine mammals and birds. While noise emissions during pile-ramming is considered to be the strongest impact for marine mammals, risk of collisions with rotor blades is a key aspect when looking at migratory landbirds as well as flying seabirds. Resting seabirds on the other hand experience a loss of preferred foraging or resting sites due to disturbance effects.

In this paper, we focus on disturbance effects by operating wind farms on seabirds in the German sector of the North Sea. From a variety of approaches and data sets, we present results for the following two scenarios.

1. For seabirds breeding at the German North Sea coast, we tagged several species with state of the art GPS data loggers to reconstruct individual flight tracks during the breeding season. Species covered are the Northern Gannet (*Morus bassanus*), the Common Guillemot (*Uria aalge*), the Black-legged Kittiwake (*Rissa tridactyla*) and the Lesser Black-backed Gull (*Larus fuscus*), all of them breeding on the island of Helgoland.

   Results show both species-specific and individual responses to the wind farms. All species avoid the wind farms to some extent, with Northern Gannets showing the strongest avoidance patterns.

2. For seabirds occurring in German North Sea waters outside the breeding season, we focus on divers (loons, Gaviidae), especially the Red-throated Diver (*Gavia stellata*). Licensing authorities rank information on wind farm effects on divers very high, especially with regard to displacement. This is based on their major and internationally important spring aggregation in the eastern German Bight, their status as Annex I species of the EU Birds Directive and their strong sensitivity to ship traffic and operating wind farms. In a new analysis for the Federal Maritime and Hydrographic Agency (BSH) and the Federal Agency for Nature Conservation (BfN), all available data from 2000 to 2017 were analysed jointly. Data originate from research projects, the national biodiversity monitoring program, environmental impact assessments and the ecological monitoring of operating wind farms. Seabird counts comprise ship-based counts, visual aerial surveys and digital aerial surveys and were analysed in a combined data base.

The results show massive impacts of offshore wind farms on the distribution of divers in the German North Sea. Divers exhibit displacement responses up to distances of 10km and more from the borders of the wind farms.
In 2016 the Nature And Biodiversity Conservation Union Mecklenburg-Western Pomerania (NABU M-V) started a research project titled „BATMOVE – Effects of offshore windfarms on bat migration over the Sea“. The aim of the project is to improve the knowledge on the spatial and temporal distribution of migrating bats crossing the North Sea and Baltic Sea and on the connectivity of their reproduction and wintering areas. Based on the results of the project methods to better assess and finally prevent collision of migrating bats with offshore wind turbines can be developed.

First results of a field study carried over the last two years will be presented here. Automated bat detector systems were installed at 10 offshore locations on the German North Sea and Baltic Sea. Bat activity was recorded at most locations and predominantly during short periods in spring and autumn. Remarkably high activities were found at two navigational buoys in the Kadet Trench north of Rostock and at the Arkona Basin, both Baltic Sea, and on Heligoland in the North Sea. These preliminary results clearly indicate that bats migrate over the North Sea and the Baltic Sea during migration seasons. However, further research also on the behavior of bats during migration especially at offshore wind turbines is needed to better estimate the impact of the growing offshore wind energy developments in German seas.

The project is supported and technically accompanied by the Federal Agency for Nature Conservation (BfN) with funds of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).
Further impacts of human activities

Thursday, 6th September 2018, 11:30h

Noise mitigation measures for offshore windfarms – requirements and overview of best practice and techniques

Sven Koschinski\textsuperscript{1}, Thomas Merck\textsuperscript{2} & Alexander Liebschner\textsuperscript{2}
\textsuperscript{1} Meereszoologie, Germany;
\textsuperscript{2} Federal Agency for Nature Conservation (BfN), Germany

Impulsive noise from pile driving has the potential to disturb marine animals or even impair their hearing. Radiation of piling noise over considerable distance can also impact marine protected areas and be in conflict with their conservation objectives. Advances in wind turbine technology suggest that supersizing of monopile foundations will lead to further increasing noise emissions in the future.

In order to reduce the impact of underwater noise and to meet legal standards (such as the dual German noise limit of 160 dBSEL/190 dBSPL at 750 m) a number of technologically advanced mitigation methods are available. Depending on the size of piles and hammer, properties of the bottom and sound radiation characteristics a combination of mitigation methods may be needed. Current state of the art mitigation technology might not be sufficient to meet noise standards in the future.

Some technological solutions aim at reducing sound emissions during noise generation. High Frequency – Low Energy Piling (HiLo Piling) reduces blow energy while increasing the number of strikes. In \textit{BLUE Piling} the duration of the impact is increased thereby reducing the sound level.

Other technologies reduce noise radiation by creating a noise shielding barrier using air, steel and/or composite materials. Such noise mitigation systems deployed close to the pile include isolation casings, cofferdams or the novel concept of the Reinhalll Pile. \textit{Hydro Sound Dampers} or \textit{encapsulated bubbles} can be deployed at various distances. In the North Sea, the big bubble curtain (single, double, triple) has been shown to be effective at a distance of 50 to 80 m from the pile depending on water depth and currents as well as space requirements for the construction equipment.

The use of a combination of systems which mitigate noise generation with others which mitigate noise radiation offers the potential for an additive and hence more effective noise reduction. In large monopiles it is already a necessity to combine different noise mitigation systems in order to meet the German noise standard.

Other ways to reduce noise include alternative low-noise foundations. Bucket foundations (also termed steel caissons), gravity based foundations and floating wind turbines are already available on the market. Drilled monopile foundations are a proven technology in bedrock, sandstone or limestone but need to be further developed for sediments such as those encountered in the North Sea. Vibropiling avoids impulsive noise but emits continuous noise instead.
Further impacts of human activities

Thursday, 6th September 2018, 12:10h

Anthropogenic underwater noise: effects on harbour porpoises

Peter Teglberg Madsen
University of Aarhus, Denmark

Many marine environments have faced a rapid increase in human encroachment over the last decades with concomitant increases in noise levels as a consequence. For shallow water species living close to land, such as the harbor porpoise, the spatial and temporal overlaps with such anthropogenic noise sources are substantial. However, since most noise sources have a low frequency emphasis and that porpoises only hear well and echolocate and communicate up at high frequencies, many researchers have previously surmised that porpoises are likely not much affected by the most common noise sources such as shipping or oil exploration. That notion has drastically changed after publication of a number of passive acoustic monitoring (PAM) studies showing that porpoise click detections drop dramatically out to substantial ranges around a diverse suite of human noise sources. The problem, however, with such PAM studies is that we do not know how the porpoise respond and what the fitness consequences are of these noise induced alterations in behavior. We have recently sought to alleviate that data shortage by deploying multi-sensor on porpoises in Danish waters. Using these data, I will highlight why it is important to understand the basic biology of wild animals in terms of their feeding behavior, energetic requirements and social/antipredator behavior to quantify and mitigate impacts from human activities at sea. Specifically, I will show that porpoises are small marine mammals with high food requirements that target small prey, meaning that they must feed much of their time and hence have little room for compensation when facing noise induced behavioral disruptions. Using tag data, I will then proceed to give examples of how porpoise respond to different types of anthropogenic noise sources, and discuss future avenues for critically needed research to inform appropriate mitigation measures.
Further impacts of human activities

Thursday, 6th September 2018, 13:50h

Ecological aspects of deep sea mining

Antje Boetius
Alfred Wegener Institute Helmholtz Center for Polar and Marine Research (AWI), Germany
MARUM University Bremen;
Max Planck Institute for Marine Microbiology

The deep-sea realm, commonly defined as the area deeper than 200m, covers >60 d% of the surface of Earth and is its largest biome. Globally relevant functions of the deep sea in the carbon cycle are the long-term storage of large quantities of carbon in the form of sedimentary organic matter and carbonates, and short-term biological remineralization of matter sinking from the surface, returning nutrients for ocean productivity. Furthermore, the deep-sea biome is fantastically rich in habitats, species and thereby genetic resources. The Census of Marine Life program estimated a diversity of a million animal and a billion microbial taxa, many of which remain to be discovered in the abyss. A third category of riches are reservoirs of ores, including polymetallic sulphides, manganese nodules, cobalt-rich ferromanganese crusts, and metals of the rare earths. This presentation will focus on the ecological framework of mining of such ore resources, which could be in conflict with the preservation of the biological resources and hence needs environmental management.

Especially with regard to ore mining, for it to be commercially viable, it will affect large areas of the deep-sea environment by disturbing the seafloor and the overlying water column, by removing seafloor substrate, and by the dispersion of sediment plumes and mining debris. The presentation will provide results of the revisit to the DISCOL “disturbance and re-colonization” experiment by SONNE expedition SO242 in 2015, 26 years after the initial disturbance by ploughing a manganese nodule area of > 1 km² at 4150 m water depth in the Southeast Pacific. In the framework of the European programs JPI Oceans and MIDAS, this area was studied intensively with deep-sea robots, camera tows and landers, to assess changes in ecosystem functions compared to undisturbed area. Among the key future tasks of marine research is to inform about the ecological principles and technologies of baseline and impact monitoring, as well as to the knowledge on spatial and temporal scales of disturbances, resilience and recovery potentials of deep-sea ecosystems, such as abyssal plains, seamounts and ridge environments.
Conservation of species and habitats

Thursday, 6th September 2018, 14:50h

Global seabird conservation: past successes, future prospects – with new chances for bird protection on the High Seas

Yann Rouxel, Cleo Small & John Croxall
Bird Life International Marine Programme, Glasgow, United Kingdom

Half of all seabird species are declining, many to globally threatened levels. The main threats on land relate to alien invasive predators, direct persecution and various forms of habitat degradation and destruction associated with human activity; at sea to commercial fisheries and pollution; climate change may cause (or exacerbate) problems in both domains. In the last two decades, notable successes have been achieved worldwide in eradicating invasive alien predators (mainly on uninhabited islands) and in finding solutions to seabird bycatch in longline and trawl fisheries. Seabird distribution is also being considered in the Marine Spatial Planning exercises occurring in some countries, and in the delineation of new Marine Protected Areas, including in the High-seas. However, many challenges remain, including removing rodents from inhabited islands, delivering conservation successes on the high seas, and tackling artisanal and gill-net fisheries. Here we review whether we have reasons to be optimistic for the future of the world’s seabirds. We review some current and prospective initiatives, including the development of new research and monitoring techniques, as well as pioneering collaborations involving governments, non-governmental organisations, scientists and civil society.
Marine mammals in the North and Baltic Seas comprise several cetacean and seal species. Some species are regularly found in both seas such as harbour porpoises, grey and harbour seals. Others are mainly found in one area, e.g. ringed seals in the Baltic Sea and white-beaked dolphins in the North Sea, or are migrating individuals such as sperm whales, hooded seals, and spotted dolphins. As top predators, all marine mammals are exposed to the cumulative effects of a wide range of anthropogenic influences and are treated as sentinel species for these marine ecosystems. At the same time, a growing number of agreements (ASCOBANS, ACOBAMS, OSPAR, HELCOM, Natura 2000, and MSFD) have resulted in national and international activities for the protection and preservation of the highly mobile marine mammals.

The first recorded seal die-off in the North Sea and adjacent waters in 1988/89 revealed just how little was known about the health status of marine mammals in this area. National and international research programmes were initiated to collect baseline information on the biology and health of marine mammals. Special focus has been placed on distribution, abundance, and habitat use but also on the understanding of the effects of noise and chemical pollution on behaviour, health, and the auditory, immune, endocrine and reproductive systems, among others. For effective protection, further research on cumulative effects of anthropogenic activities on marine mammals, as well as interactions and implications of population increases and decreases, is needed. Research, protection, and management plans for cetaceans and seals should be achieved on an international level and secured by the European Commission.
Conservation of species and habitats

Thursday, 6th September 2018, 16:40h

Reintroduction of Sturgeons in Europe – a success story?

Jörn Gessner\(^1\), Gerd Michael Arndt, Andrzej Kapusta, Peter Rask-Möller, Ryszard Bartel, Michal Skora, Meelis Tambets, Ruta Medne, Andrej Pilinkowski
\(^1\) Leibniz-Institute for Freshwater Ecology and Inland Fisheries, Berlin, Germany

Following the decline of sturgeon populations in the 19th century the Baltic sturgeon \((A.\ oxyrinchus)\) was extirpated in its range between 1940 and 1996. The first initiatives for its recovery started in 1994 and resulted in a series of projects funded and accompanied by the Federal Agency for Nature Conservation (BfN) to determine the feasibility and to establish the recovery measures. Since 2012 the major share of funding originates from the Federal States of Mecklenburg-Vorpommern and Brandenburg, as well as from the institutions involved.

The recovery measures are structured in four phases extending over a total of 25+ years. From the beginning a strong international collaboration was part of the activity due to the fact that these long distance migrants have a marine range of more than 2500 km from their natal river to which they return for reproduction. Also the fact that 80% of the catchment of Oder River is Polish territory, the venture required a strong bilateral aspect. Under the auspices of the Helsinki Commission two project groups were established to facilitate coordination and leading to the development of a joint Helcom sturgeon Action Plan. Phase 1 comprised the establishment of an ex situ stock, the verification and assessment of potential threats and causes for the decline including habitat quality, the development of the respective countermeasures, an initial establishment of biotechniques required and communication actions. Phase 2 included the experimental reproduction, rearing and release. This also opened the opportunity to investigate the behavior of the fish released in the altered environment and to determine adverse impacts upon the fish released. Phase 3 involves the main activities for the establishment of a self-sustaining population, including the utilization of a decentralized rearing and release strategy as well as a strong emphasis on the collaboration with fisheries. The 4th Phase is a follow up which needs to address the assessment of the broodstock in the wild, the effectiveness of the reproduction and the recruitment to verify deficits in the process. During this time the option to continue releases as long as the natural recruitment is too weak to maintain a stable population or to increase population size. The measures taken and the structure of the project are a blueprint for the activities to re-establish the European sturgeon \((A.\ sturio)\) in the Elbe River catchment too, providing the opportunity to adapt the methods and technologies to the even rarer species. The presentation provides selected results of the past activities and an outlook on the future perspective.
Conservation of species and habitats

Thursday, 6th September 2018, 17:20h

Progress in the implementation of international decisions for the protection of Elasmobranchs

Ralf P. Sonntag
Senior Advisor International Fund for Animal Welfare (IFAW)

Over centuries sharks had a negative image in the public. Despite high catch rates, sharks were hardly managed and were considered a pest. Unlike for dolphins, turtles or whales there was no public pressure for the conservation of sharks. Populations decreased all over the world. The greatest threat is overfishing and the lack of management. The primary driver for the overfishing is the demand for shark fins for a soup dish in some areas in Asia.

Only recently since a few years public awareness of the decline of shark populations and other elasmobranchs has grown. An increasing number of countries has acknowledged this and is supporting conservation actions on a regional and a global level.

The talk will focus primarily upon the new listings and their implementation in CITES and CMS, it will inform about the growing progress in these conventions and some other fora and the efforts to enforce them, CITES is a good instrument to help a more sustainable utilisation for sharks and CMS is very important to facilitate international cooperation in the management of migrating elasmobranchs.

There has been a growing number of workshops, organized by NGO’s in close cooperation with countries all over the world to train fishermen and management authorities to implement these decisions for the conservation of elasmobranchs.
Conservation of species and habitats

Friday, 7th September 2018, 9:00h

Coral Reef Conservation in recent decades, and the future of reefs

Charles Sheppard
University of Warwick, UK

Research on the exceptionally high diversity and productive coral reef system and its conservation has increased in the last 30 years as fast as in many other fast-growing scientific subjects. But, in contrast to those other subjects, for example medical research, the condition of reefs worldwide continues to decline. This is because the main impediment for reef conservation today is no longer one of scientific knowledge, but is political. It has been shown repeatedly, in many different ways, what the value of reefs are for provision of food, for shoreline protection, and for the economies of many countries: it can no longer be reasonably claimed that we do not know the value of coral reefs to us, and by ‘us’ I mean not only those people living on top of them in the tropics but the value to the whole, integrated, global ecosystem. Economic estimates of coral reefs extend to a third of one million dollars per hectare per year. This excludes social costs, but it does show economists and governments that the living component of our planet should be considered more centrally. The reasons for the decline of reefs in the world are well understood, and it is known that these reasons are not the same as those that prevent reefs recovering after an impact. The latter are more varied according to location. Reasons for decline are now pre-eminently the extended warming episodes that are affecting our oceans, while the reasons for reefs not recovering afterwards are commonly local in origin: raised nutrients, overfishing, shoreline disturbance etc. In some areas such as the Arabian Gulf over 70% of reefs have essentially disappeared and, although scientific indicators confirm very clearly that this is happening, it is commonly discounted as even being a possibility in government circles. Several other areas of the world are declining as quickly. Management remains very inadequate, indeed the term ‘reef management’ is an oxymoron filled with hubris. This is not a scientific failure but rather it is political failure. Prognoses are, sadly, for a further decline as the principal reason now for reefs being killed, i.e. warming episodes, are increasing both in intensity and frequency. For many regions of the tropics we are now at or possibly beyond that cusp of when frequency of recurrence of these reef-killing episodes is exceeding the ability of reefs to recover during cooler periods between them. Implications to biodiversity (because reefs support nearly a quarter of all marine species), to shoreline and property erosion, and to food security are enormous.
The European flat oyster (*Ostrea edulis*) formed reef habitats with associated species-rich biocoenoses in offshore areas of the German Bight. Historically, it covered vast subtidal areas, but vanished completely within the last century as a consequence of overexploitation.

Because of their high ecological value, wide areas with degraded oyster beds are in the focus of European conservation efforts. According to the Habitats Directive for the protected habitat type „reef“, a favourable conservation status is to be preserved or restored. This requirement has led to the current situation, whereby population support measures take not only the concerns of oyster harvesting, but also conservation concerns into account. In the context of cooperation within the Oslo-Paris Commission (OSPAR), the oyster was identified as an especially endangered species and as a creator of habitat, and measures for its protection in their area of distribution were agreed. In view of the ecosystem-related benefits of oyster reefs, especially the high biodiversity of species found in reefs, the Federal Agency for Nature Conservation (BfN) and the Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research (AWI) are engaged in the restoration of native European oyster reefs in the North Sea.

In this context a European-wide network, the Native Oyster Restoration Alliance (NORA) was established to facilitate knowledge and technology transfer. The presentation will provide an overview of the restoration activities taking place in Europe, with a special focus on Germany and Scotland.

The presentation focuses on

- historical distribution of *O. edulis* in the North Sea and reasons for its drastic decline.
- important criteria for successful restoration.
- the recently founded Native Oyster Restoration Alliance (NORA).
- the DEEP project in Scotland: restoring oyster in the Dornoch Firth.
- the RESTORE project in Germany: restoring offshore oyster beds.
Conservation of species and habitats

Friday, 7th September 2018, 10:20h

Protection of “Bubbling Reefs” in the Kattegat

Anna-Grethe Underlien Pedersen
Danish Environmental Protection Agency, Denmark

Unique formations of bubbling reefs occur in the northern Kattegat in Danish coastal waters. Today, almost all known positions of bubbling reefs are located within 8 Natura 2000 sites. In 1988 sports divers discovered a unique underwater landscape with sandstone formations – bubbling reefs - at 10-12m depth around the islands of Hirsholmene in the northern Kattegat. Local fishermen had for decades gained parts of the sandstone in their fishing nets, causing some destruction. Therefore several positions of sandstone formations were known by fishermen. Scientists investigated in the years after sites of bubbling reefs, and demonstrated the connection between gas emissions and sandstone formations. Bubbling reefs are believed to be formed by microbial oxidation of methane in the upper layer of sediment, leading to precipitation of lime that glues together the sediment to sandstone formations. Subsequent erosion of the surrounding seabed has exposed the sandstone structures above the bottom level. Bubbling reefs can cover 100 m² in area and consist of pavements, complex formations of slab-type layers, and up to 4 meters high columns.

The Habitats Directive from 1992 imposes the member states responsibility to designate areas of conservation for specific habitat types and species. “Submarine structures made by leaking gases (1180)” is a habitat type included in the directive. Denmark used the knowledge about the occurrence of bubbling reefs to designate habitat areas (Natura 2000 sites) in the northern part of Kattegat. In 2007, the Nature Agency carried out a survey in the Northern Kattegat and found several new positions with bubbling reefs. Therefore some habitat areas were extended.

In 1995, the Danish Environmental Ministry implemented the first protection of bubbling reef at Hirsholmene by expanding an existing nature reserve to include the bubbling reefs and prohibiting trawling and anchoring near them. After that, protection has taken place in the Natura 2000 framework - both in an international and a national track. The first Danish Natura 2000 plan was adopted in December 2011.

In 2011 Danish officials - the Fisheries Agency together with the Nature Agency – started the preparation of international fisheries regulation proposals for 10 Natura 2000 sites, where 2 sites included bubbling reefs. In the following years a comprehensive work was done in the preparation of the proposals - a work that included dialogue with fisheries and environmental stakeholders and Swedish and German officials. The Danish proposals were submitted for approval, in the form of joint recommendations, to the EU Commission in March 2015. The delegated act (EU regulation) was published in October 2015 - and entered into force January 2016. This EU regulation implements commercial fisheries management that meets the conservation objectives in the Natura 2000 plans. The EU regulation prohibits bottom-contacting and passive fishing gear within a distance of 240 meters from bubbling reefs. In 2017 the second EU regulation entered into force for 7 Natura 2000 sites - 3 with bubbling reefs. Currently Denmark is preparing another draft of fisheries regulation proposals.
Conservation of species and habitats

in 5 Natura 2000 sites in the North Sea - 1 with bubbling reefs.

National legislation regulates all Danish fishing activities – both commercial and recreational. Only Danish fishing activities are allowed within 3 nautical miles of Danish coast but trawling is prohibited in the zone. Bubbling reefs are therefore protected from trawling within the 3 nautical miles zone. A total ban of fishing activities on bubbling reefs – both commercial and recreational – was completed in 2013 and 2018. Since international fisheries regulation does not regulate recreational fishing, Danish national legislation also includes a ban of Danish recreational fishing on bubbling reefs beyond 3 nautical miles from the coast.
Conservation of species and habitats

Friday, 7th September 2018, 11:30h

Progress in biotope mapping of reef structures in the North Sea and Baltic Sea

Alexander Darr¹, Kolja Beisiegel¹, Tim Bildstein², Roland Pesch², Dieter Boedeker³, Kathrin Heinicke³
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³ Federal Agency for Nature Conservation (BfN), Germany

Detailed knowledge on the distribution and characteristics of reef structures is a major prerequisite for their assessment and monitoring as implemented in the Habitats Directive as well as the Marine Strategy Framework Directive of the EU. In Germany, reefs are to be protected under the German Environmental law as they are unique in terms of morphology and ecological functions. In this talk two approaches will be presented on how reefs are currently mapped within the German North and Baltic Sea at different spatial scales. At first, high resolution reef mapping is presented by example of the North Sea as put down in a national mapping guideline for legislative approval procedures recently published by the Federal Agency for Nature Conservation. Corresponding maps are produced for small areas only and do not allow for a representative reef inventory within the German North and Baltic sea. Hence, in a second actual case study the mapping of reef structures are presented by making use of full coverage sedimentological and other abiotic geodata as well as biological ground-truthing within the Natura 2000 site Fehmarn Belt of the Baltic Sea. Corresponding data are currently produced within national habitat mapping projects initiated by the Federal Agency for Nature Conservation since 2011.
Additional presentations

Friday, 7th September 2018, 12:10h

Practical approaches to manage and reduce underwater ship noise

David Hannay
JASCO Applied Sciences, Canada / Germany

Marine mammals use sound for navigating, attracting mates, mother-calf contacts, warning sounds, social interactions, maintaining group integrity, detecting predators, passive prey detection and for echolocation prey detection and tracking (Clark et al., 2009). Their underwater hearing physiologies evolved in environments that did not include anthropogenic noise - the introduction of which increases auditory masking and reduces distances over which important sounds can be detected and recognized. Increased masking of important sounds by commercial shipping noise can adversely affect animals’ abilities to use those sounds as effectively for life function purposes, thus potentially reducing their fitness. This presentation presents on approaches for managing underwater sound and mitigating its effects on marine fauna. In particular, it discusses approaches that have been taken to track noise from vessels, and to provide incentives to shipowners to use quieter vessels.
Implementation of nature conservation and sustainability aspects within the Common Fisheries Policy

Rainer Froese
GEOMAR Helmholtz Centre for Ocean Research / University of Kiel, Germany

The Common Fisheries Policy (CFP) of Europe requires that overfishing ends in 2015, latest 2020; fish stocks are rebuilt above the level that can produce maximum sustainable yields; negative impacts of fishing are to be minimized; low impact fishing methods are to be introduced; minimum conservation sizes are to prevent the capture of juveniles; marine ecosystems are to be rebuilt and maintained at full functionality; marine protected areas are to be established, with the option of complete exclusion of fishing activities; and the Marine Strategy Framework Directive is to be supported. Unfortunately, a reality check shows that ending overfishing in 2015 has been missed completely and 40% of the stock with available data are still subject to overfishing in 2017. None of the other goals of the CFP have been implemented. Projections show that, with fishing slightly below the maximum sustainable level, most European stocks can be rebuilt in 2-4 years, catches will be about 50% higher than today, and profits of fishers will double. Yet, the EU Council of Ministers has insisted on Multiannual Plans (MAPs) for implementing the CFP that pursue none of the conservation goals listed above and instead allow high levels of overfishing under a variety of weekly-defined scenarios. In the Western Baltic, which has a MAP since 2016, cod and herring are subject to ongoing overfishing despite very low stock sizes, recruitment failures, and severely truncated age structure in cod. In summary, it seems that the binding law of the CFP, which has all the ingredients to restore European Seas to good environmental status, is undermined by Multiannual Plans which ignore conservation and restore overfishing.