ABSTRACTS (Version: 2012-06-14)

3rd International Conference on:

Progress in Marine Conservation in Europe 2012

18.-22. June 2012

OZEANEUM, Stralsund, Germany
Today’s global Oceans Stresses, Impacts and Solutions - The State of the Ocean Report

Dan Laffoley, Marine Vice Chair, IUCN’s World Commission on Protected Areas/Senior Advisor, Marine Science and Conservation, IUCN’s Global Marine and Polar Programme

In 2011 the International Programme on the State of the Ocean (IPSO), in partnership with the International Union for Conservation of Nature (IUCN), brought together a select group of world science leaders on ocean stresses and impacts to reflect on these issues, and propose creative solutions.

The workshop provided a rare opportunity to interact with other disciplines to determine the net effect of what is already happening to the ocean and is projected to do so in the future. The outcome of this event was world-wide publicity on the challenges the ocean faces in our modern world – these include the facts that:

- Human actions have resulted in warming and acidification of the oceans and are now causing increased hypoxia.

- The speeds of many negative changes to the ocean are near to or are tracking the worst-case scenarios from IPCC and other predictions. Some are as predicted, but many are faster than anticipated, and many are still accelerating.

- The magnitude of the cumulative impacts on the ocean is greater than previously understood

- Timelines for action are shrinking.

- Resilience of the ocean to climate change impacts is severely compromised by the other stressors from human activities, including fisheries, pollution and habitat destruction.

- Ecosystem collapse is occurring as a result of both current and emerging stressors.

- The extinction threat to marine species is rapidly increasing.

This opening presentation will explore the values of the ocean, the conclusions of this workshop and a subsequent one held a year later in spring 2012. It will look at some of the solutions in place or planned, including some innovative actions, to help engage a broader audience in seeking ocean recovery.

This presentation sites within the overall messages from the workshops are that unless significantly more action is taken now with much greater ambition, the consequences of our activities are at a high risk of causing, through the combined effects of climate change, overexploitation, pollution and habitat loss, the next globally significant extinction event in the ocean. It is notable that the occurrence of multiple high intensity stressors has been a pre-requisite for all the five previous global extinction events of the past 600 million years.
Marine Biodiversity and Networks of Marine Protected Areas
Towards a Global Network of MPAs

Dr. Henning von Nordheim, German Federal Agency for Nature Conservation (BfN), Isle of Vilm, Germany

The oceans and deep seas cover 2/3 of the global surface area. They play an important regulating role in the Earth’s climate and are home to a major part of the oceans’ and world’s biodiversity, containing some of the most productive ecosystems, vast natural resources, unique habitats, and globally rare species, some not even discovered. Various pressures resulting from intensified human uses, climate change and ocean acidification threaten to undermine these ecosystems’ biodiversity, balance and resilience. As the open oceans and deep seas often fall outside of national jurisdictions, international cooperation and coordination is fundamental for their conservation.

At the World summit on Sustainable Development global leaders agreed in 2002 that by 2012 a comprehensive network of MPAs be established a start to improve the status of oceans biodiversity. Through UNGA resolutions, activities of an UN informal working group in BBNJ (Biodiversity beyond National Jurisdiction) and especially decisions of the Conferences of Parties to the Convention of Biological Diversity (CBD) in 2008 and 2010 in the meantime substantial steps were taken.

These activities are complemented by the Global Ocean Biodiversity Initiative, supported by the German Federal Agency for Nature Conservation with core funding.

The Global Ocean Biodiversity Initiative is a multi-partner project aiming to help identify ecologically or biologically significant marine areas (EBSA) in need of protection beyond national jurisdiction based on the Convention on Biological Diversity scientific criteria. The objectives of this project are to establish a scientific collaboration process to assist States and relevant regional and global organisations with the best available scientific data and methods; to provide illustrations and initial guidance on how the EBSA criteria can be interpreted and applied; as well as to develop selected regional analyses.

After CBD COP 10 3 regional workshops were conducted to identify EBSAS in different regions and some additional 3 are planned until end of 2012. Further important initiatives to protect High Seas Areas are conducted by CCMLAR for the Antarctic region.

The Presentation aims at giving an up-date overview of ongoing global developments in identification of EBSAS and establishment of MPAs as well as touching upon the complex issues regarding governance and management of MPAs in marine areas beyond national jurisdiction (ABNJ).
Network of MPAs in the Maritime Area of OSPAR and HELCOM by 2012

Baltic Sea

Dieter Boedeker, Federal Agency for Nature Conservation, Germany

The first concrete step towards a network of coastal and marine protected areas in the Baltic Sea was HELCOM Recommendation 15/5 in 1994 which recommended:

“that the Contracting Parties take all appropriate measures to establish a system of Coastal and Marine Baltic Sea Protected Areas (BSPA)…

that this system of BSPA’s be gradually developed … Special attention shall be paid to including additional coastal terrestrial areas and to including marine areas outside the territorial waters…”

A first suite of 62 preliminary BSPAs was listed in the Recommendation and presented on a map.

The second step towards the network was the Joint Work Programme on Marine Protected Areas for the OSPAR and HELCOM Convention areas, agreed in 2003 during the first joint meeting of the HELCOM and OSPAR Commissions in Bremen, Germany. It included concrete steps in order to establish a network of marine protected areas for the Northeast Atlantic and the Baltic Sea by 2010.

The result of an evaluation project on the status of the BSPA network, carried out by the lead country (Germany) and the HELCOM secretariat from 2006 to 2010, was encouraging: The nine Baltic Sea nations designated officially 159 BSPAs by end of February 2010. This amounts to an area of 48,784 km² and equals 10.3 % of the HELCOM marine area, compared to only 3.9 % eight years ago and 5.5 % four years ago. Despite this very encouraging development during the past years, the evaluation concluded that the current network of BSPAs was neither ecologically coherent nor complete. Main reasons were the strong bias of the network towards near-shore and inshore areas, no adequate distribution of BSPAs across the different sub-regions of the Baltic Sea, and a lack of effective protection regimes inside BSPAs.

Therefore the 2010 HELCOM Ministerial Declaration on the implementation of the HELCOM Baltic Sea Action Plan in Moscow (Russia) included agreements

“to secure the establishment of a network of BSPAs that fulfils the criteria of ecological coherence …;

that where appropriate, the Contracting States identify additional BSPAs at the latest by the end of 2011 taking into account respective proposals for potential BSPAs to be elaborated by HELCOM HABITAT …;

including off-shore areas also in the Exclusive Economic Zone with the aim that BSPAs not only cover a total of at least 10% of the Baltic Sea Area as a whole, but also when scientifically justified, at least 10% of all its sub-basins, …;

to develop and apply by 2015, management plans and/or measures for already existing BSPAs; and
that every new BSPA designation should within five years be followed by the establishment of a management plan and/or measures.”

It can be concluded that significant steps towards a network of marine protected areas in the Baltic Sea were already done by HELCOM and the Baltic Sea states that BSPAs are widely accepted as being an important tool for the protection of marine biodiversity and the entire ecosystem, but more efforts are needed in order to receive an ecologically coherent and well managed network.
MPAs in the Mediterranean Sea - Coherence and Efficiency

Marie Romani, MedPan, France

Over the past 20 years, progress has been made to advance marine conservation in the Mediterranean. MPAs have been developed to better manage either natural resources or activities that jeopardize their sustainability. International, European, Mediterranean and National agreements and laws are now in place to protect our biodiversity and ecosystems and to create MPAs. Businesses from many sectors are demonstrating environmental and social responsibility. There is a greater understanding of the economic benefits from MPAs.

But, the challenges are still huge to reach a coherent and well-managed network of MPAs in the Mediterranean until 2020.

The percentage of the surface area protected in the Mediterranean Sea is currently 3.88%. However, without the Pelagos Sanctuary, this proportion plummets to 0.4%.

From a regional perspective, the current MPA system is not representative of all habitats and ecosystems. The majority of Mediterranean MPAs are presently located on the coast. High sea ecosystems are only represented by the Pelagos Sanctuary in the northwestern Mediterranean. Moreover, among the coastal sites currently protected or managed, 69 MPAs (or 73.4%) are located along the basin’s northern shore, highlighting the lack of MPAs in the southern and eastern waters.

A large number of MPAs in the Mediterranean may also be ecologically isolated as the spacing of the existing MPAs is likely too wide to ensure ecological connectivity among MPAs and viable functional maintenance of marine meta-populations. Consequently, the set of MPAs established in the Mediterranean cannot be defined as an ecological network, but as an initial system upon which a coherent network should be designed.

Many existing MPAs:

- Are currently insufficiently managed and can be referred to as “paper parks”;
- Still lack management plans (only 42% of Mediterranean MPA have a management plan), clear goals and objectives, and mechanisms in place to periodically assess whether objectives are met;
- Do not carry out analysis to understand the socio-economic context of the surrounding communities;
- Do not qualitatively assess or quantitatively monitor natural resources which the site aims to protect or the results of management interventions.
- Have insufficient human resources and training;
- Have low financial resources, equipment and facilities (offices, boats, visitor centres, diving equipment, GIS) and therefore cannot manage properly, even in a basic manner, their marine area;
- Have low or no law enforcement, lack marker buoys at sea, surveillance boats and staff, and offenders are insufficiently prosecuted.
In particular, management of MPAs should be emphasized in countries of the southern and northeastern Mediterranean. These areas revealed major needs and challenges related to management capacity.

Prospects of achieving CBD targets of effective protection of at least 10% of the Mediterranean ecological region, as well as considerable improvements in management effectiveness over the next years will be possible only if there is renewed, stronger and consistent commitment to such a strategy by riparian nations, NGOs, institutional and scientific institutions, MPA managers and the private sector.

An additional and principal prerequisite to achieving these targets is also the need to strengthen the connections between all the stakeholders in order to draw out a common vision and roadmap. This implicates that the needs of concerned parties are taken into account, the obstacles they encounter are identified and solved and that a given stakeholder is heard and understood by others from different disciplines. It also requires that the coordination process is well informed and adaptive.

Since 1990, the MedPAN network has demonstrated its efficiency to facilitate exchanges between Mediterranean MPAs managers to improve their management efficiency.

MedPAN will organize in November 2012 in Turkey, with RAC/SPA and several other partners the Mediterranean MPA Forum.

The MPA Forum is a unique event: sharing-experience and knowledge, prompting a constructive dialogue between all actors of MPAs in the Mediterranean, identifying the needs of actors and their constraints to reinforce MPAs’ ecological representativeness and MPA management efficiency.

Coinciding with the CBD 2012 targets, the Forum will provide a platform to share success stories on MPAs, to highlight the challenges on Mediterranean MPAs and to engage every actor (decision-makers, MPA managers, scientists and private sector) to make commitments for MPAs until 2020.
Progress of the UK's MPAs towards an ecologically coherent network

Jenny Oates and Jon Davies, Joint Nature Conservation Committee, United Kingdom

The Joint Nature Conservation Committee (JNCC) provides scientific advice to the UK Government and Devolved Administrations (Northern Ireland, Scotland and Wales) regarding the identification of a network of Marine Protected Areas (MPAs) in the UK. Towards this aim, JNCC have been working together with the other statutory nature conservation agencies in the UK to identify a suite of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in the marine environment. In the UK the network of marine SACs for habitats and species is almost complete, and work is ongoing to complete the network of marine SPAs. These SACs and SPAs with marine components have been recommended to the OSPAR Commission by the UK as its contribution to the OSPAR network of MPAs in the NE Atlantic. However the list of marine habitats and species of European importance for which SACs and SPAs are selected is limited, which means that there are significant gaps in the existing network of MPAs in terms of representing the range of habitats and species in UK waters.

UK administrations established MPA projects to fill these gaps by representing the full range of marine habitats and species in the UK, and protecting rare and threatened habitats and species (e.g. features from the OSPAR List of Threatened and/or Declining Species and Habitats). JNCC has been working in partnership with Natural England on the identification of MPAs through the Marine Conservation Zone project in English territorial waters and UK offshore waters adjacent to England, Wales and Northern Ireland. JNCC is also involved in the Steering Group and Technical Advisory Group for the Marine Conservation Zone Project Wales covering Welsh territorial waters. JNCC also work in partnership with Marine Scotland and Scottish Natural Heritage on the Scottish MPA project to identify Nature Conservation MPAs in Scottish territorial waters and UK offshore waters adjacent to Scotland. New legislation is currently progressing through the Northern Ireland Assembly that contains provisions for the designation of Marine Conservation Zones in Northern Ireland’s territorial waters.

Together with existing MPAs, the new MPAs which are being identified by these projects in the UK will contribute towards the UK administrations’ policy aim of achieving an ecologically coherent network. It will also enable the UK to meet international commitments regarding the creation of coherent and representative networks of MPAs (including the OSPAR Convention, Convention on Biological Diversity and EC Marine Strategy Framework Directive).

This paper will outline the progress in each of the national projects towards identifying new MPAs, demonstrating how each project is underpinned by common network design principles drawn from OSPAR guidance on developing ecologically coherent MPA networks. For example, the OSPAR guidance recommends that classification of the marine environment to EUNIS level 3 is most appropriate for ensuring that MPA networks protect areas that best represent the range of habitats in an area. Therefore the broad-scale habitats used to identify Marine Conservation Zones and the broad seabed habitats among the Scottish MPA search features have been selected to be equivalent to EUNIS level 3 habitats.

A key current issue is how to determine whether UK’s MPAs are making an adequate contribution towards an ecologically coherent network. Consideration of this issue needs to be underpinned by biogeography but must also respect the devolved responsibilities which correspond to administrative areas of UK waters.
Through work with the OSPAR Convention, JNCC are currently developing methodologies for assessing whether MPA networks are ecologically coherent. JNCC are working with the OSPAR Secretariat and Germany to analyse the overlap of OSPAR MPA boundaries with OSPAR threatened/declining habitats. The results of this exercise will enable the application of the third initial test in the OSPAR area which will contribute towards a rough assessment of whether the OSPAR network of MPAs is ecologically coherent. The third test asks whether most (70%) of the threatened and/or declining species and habitats (with limited home ranges) are represented in the OSPAR Network of MPAs, such that at least 5% [or at least three sites] of all areas in which they occur within each OSPAR Region is [are] protected.

JNCC are also working with France to trial a simplified version of the OSPAR matrix approach in the Channel area. The simplified version of the matrix allows understanding of five of the OSPAR elements of an ecologically coherent network (Features, Representativity, Replication, Resilience, and Connectivity). The trial will include a consideration of how success criteria could be used to evaluate Adequacy/Viability in the future, and the limitations associated with such a step. The work will also aim to make some suggestions on suitable success criteria for wider consideration by OSPAR.

To conclude, this paper will provide a perspective on the best way forwards in terms of assessing the progress of the UK’s MPAs towards an ecologically coherent network and discuss the likely challenges that will be encountered.
Management and Monitoring of Marine Protected Areas
Towards the Management of MPAs in the German EEZ of the North- and Baltic Sea

Detlef Czybulka, University of Rostock, Germany
Jochen Krause, Federal Agency for Nature Conservation, Germany

Germany identified and nominated ten Natura 2000 sites across the German EEZ in the North Sea and the Baltic Sea to the European Commission on 25 May 2004. According to European legislation (Art. 4(4) Habitat Directive) Member States have to designate their Natura 2000 site as a special area of conservation as soon as possible and within six years at the latest and shall establish appropriate management plans (Art. 6(1) Habitats Directive) in due time.

The German Natura 2000 sites in the EEZ were accepted by the European Commission in November 2007 and therefore Germany is looking forward to reach this obligation with the given six year time period. In Germany the Federal Agency for Nature Conservation together with the Federal Environmental Ministry are responsible for this task. They are supported in this process by legal advisers and marine ecologists of the University of Rostock and other marine research institutions as external subcontractors.

To develop effective ordinances and management plans for these sites a number of substantial questions have to be answered, such as:

- Which are the species (animals and plants) and habitats to be protected,
- What are the conservation objectives for the selected species and habitats as well as for the site itself
- What are the specific sensitivities of the species and habitats in the designated areas
- What are the appropriate measures to avoid deterioration of natural habitats and of habitats of species
- What are the contents of an appropriate assessment to estimate the effect on the conservation objectives by human activities, especially for plans or projects
- What are management measures within the national and the European jurisdictional framework and which have to be developed according to the law of the European Union, regional environmental law (Helsinki and OSPAR-Conventions) and to the United Nations Law of the Sea (UNCLOS).

Additionally, the Marine Strategy Framework directive (MSFD) from 2008 introduces as a new component the ecosystem approach as a guideline for measures to reach good environmental status of all of the European Seas. This strongly supports the development of a network of well managed MPAs. The MSFD requirements will be integrated in the here developed management plans.

For offshore MPAs in Europe these questions are of general importance to all Member States and we will introduce in our talk first ideas and guidance we have developed so far.
Wadden Sea World Heritage - Recent Progress in Protecting and Managing the World’s largest Tidal Barrier Island System

Jens Enemark, Common Wadden Sea Secretariat

The Wadden Sea is the world’s largest tidal barrier island system shared by the Netherlands, Germany and Denmark. Since the late 1970s the three governments have cooperated to protect and conserve the Wadden Sea as an entity and for now a generation the Wadden Sea has been under a comprehensive nature protection by national parks in Germany and nature reserves in the Dutch and Danish parts of the Wadden Sea. In 1982 the three governments at a ministerial meeting formalized their cooperation by signing the Joint Declaration on the Protection of the Wadden Sea which was renewed at the last Wadden Sea Ministerial Conference on Sylt in 2010. In 1987 the Common Wadden Sea Secretariat was established to support and facilitate the Cooperation.

At consecutive ministerial meetings since 1978 a comprehensive joint protection, management and monitoring framework has been established of which the Wadden Sea Plan and the Trilateral Monitoring and Assessment Programme constitute the cornerstones. Through the regular Wadden Sea Quality Status Reports there is a comparatively good assessment of the progress and the presentation will, in addition to the outlining the structure of the Cooperation, present main results of the latest Quality Status Report 2009, the progress which has been made in protecting the Wadden Sea, the issues of concern and the main future challenges.

The Dutch-German Wadden Sea was inscribed on the World Heritage List in 2009. It is expected that it will be extended with the Danish part in the near future. The inscription of the Wadden Sea on the prestigious World Heritage List of properties is a recognition of its outstanding universal value and of the progress and achievements which have been made in protecting and managing the area as an ecological entity. The presentation will outline the significance of the recognition and the future challenges and opportunities of being a World Heritage property including outlining the perspectives of protecting and managing the Wadden Sea.
Management of Anthropogenic Impacts on Marine Ecosystems
ICES – a global organization for enhanced ocean sustainability

Anne Christine Brusendorff, International Council of the Exploration of the Sea, Denmark

ICES is an intergovernmental organization whose main objective is to increase the scientific knowledge of the marine environment and its living resources and to use this knowledge to provide advice to competent authorities. ICES Science and Advice considers both how human activities affect marine ecosystems and how ecosystems affect human activities. In this way, ICES ensures that best available science is accessible for decision-makers to make informed choices on the sustainable use of the marine environment and ecosystems.

To achieve this objective ICES prioritizes, organizes, delivers and disseminates research needed to fill gaps in marine knowledge related to issues of ecological, political, societal, and economic importance at the pan-Atlantic and global levels.

The main ICES deliverables are scientific publications, and scientific information and management advice requested by member countries and also international organizations and commissions such as the North East Atlantic Fisheries Commission (NEAFC), the North Atlantic Salmon Conservation Organization (NASCO), the Oslo Paris Commission (OSPAR), the Helsinki Commission - Baltic Marine Environment Protection Commission (HELCOM), and the European Commission (EC). Importantly, these products are unbiased, non-political in nature, and based on the best available science.

ICES – and fisheries

The ICES approach to fisheries advice integrates the precautionary approach, maximum sustainable yield, and the ecosystem approach into a single advisory framework. The aim, in accord with the intent of most international guidelines, is to inform policies for high long-term yields while maintaining productive fish stocks within healthy marine ecosystems.

The precautionary approach framework was implemented by ICES in 1997. Since 2010, the basis for ICES advice has been complemented by the maximum sustainable yield (MSY) concept. The current evolution of ICES advice includes a transition process to attain full implementation of the MSY approach by 2015. In 2011, ICES provided advice on more than 200 fish stocks.

ICES advice beyond fisheries

ICES also provides environmental advice on a wide range of ecosystem issues thereby supporting management by providing the science input needed for the policy process. This input comes in many forms. Specific examples include providing background information to help identify vulnerable marine ecosystems, providing peer review for partner commissions, assessing the compatibility of the application of a NAFO guideline for the identification of corals and sponges in the NEAFC area, developing fishery management plans in protected areas, advancing biologic knowledge and assessment methods for deep-sea fish, and establishing a strategic initiative on biodiversity. Other recent examples include advice on by-catch of marine mammals, integrated monitoring and assessment of chemicals and biological effects, atmospheric monitoring of PFOS (Perfluorooctane sulfonate), effects of mariculture on populations of wild fish, and monitoring methodologies for ocean acidification.

ICES advice is responsive and constantly evolving to accommodate the demands of important legal frameworks such as the global commitments outlined in the Johannesburg Plan of Implementation adopted by the World Summit on Sustainable Development, and
regional commitments such as the European Commission fisheries policy. The current evolution of ICES advice includes a transition process to attain full implementation of the MSY approach by 2015.

**Convention and geographic scope**

The International Council for the Exploration of the Sea (ICES) was established in 1902 by exchange of letters between participating countries. In 1964, through an agreed Convention, ICES received a legal foundation and full international status.

The Convention covers the Atlantic Ocean and its adjacent seas. ICES has focused on the North Atlantic Ocean and the Baltic Sea. The ICES community includes all 20 coastal states bordering these two marine areas.

The ICES cooperative network extends far beyond its member states, and encompasses international organizations, non-member countries, and scientific institutes/scientists worldwide.

**Member Countries and Secretariat**

The 20 member countries of ICES are: Belgium, Canada, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Latvia, Lithuania, the Netherlands, Norway, Poland, Portugal, Russia, Spain, Sweden, United Kingdom, and the United States of America. ICES comprises a network of more than 4000 scientists from almost 300 institutes, with 1600 scientists participating in activities annually.

The ICES Secretariat has been based in Copenhagen, Denmark, since 1902. The Secretariat staff (53 individuals) provides secretarial, administrative, scientific, and data handling support to the ICES community.
Minimizing Underwater Noise from Offshore Wind Farm Construction

Karin Lüdemann, Wissenschaftsbüro Hamburg, Germany

The German government has decided on the construction of offshore wind farms with a capacity of 20,000 to 25,000 MW up to 2030 in the North Sea and Baltic Sea. The foundations most commonly used for wind turbines are monopiles, tripods, and jacket foundations. For the installation of all of these foundations types, large steel piles have to be driven in the ground, mostly by impact pile driving. Pile driving activities are of special concern as they generate very high and relatively broad-band noise levels. Major energy falls in the low frequency range below 1 kHz and overlaps with the frequency spectrum of best hearing of fishes. The emitted sound has the potential to seriously affect marine animals.

Underwater noise may negatively impact marine mammals, fish, and other marine organisms. The possible effects include immediate or delayed death, severe injury, temporary or permanent deafness (temporary/permanent threshold shift, TTS/PTS), masking of biological relevant noise, and disturbance by e.g. behavioural reactions (avoidance) and physiological responses (stress).

During the installation of turbines in the German wind farm “alpha ventus”, sound exposure levels of up to 174 dB were measured in 750 m distance from the pile. For each pile, up to 8,700 impulses were necessary in order to fix the pile in depths of about 40 m in the floor. These values demonstrate that the effective German noise exposure criteria (160 dB SEL / 190 dB peak-peak in 750 m distance) have not been met during recent offshore constructions.

Hence a reduction of noise emissions during offshore construction work is needed in order to ensure that the construction of thousands of wind turbines within the forthcoming years can be done without harmful impacts on marine organisms. Different basic principles exist to meet these demands. Noise reduction can be achieved either by mitigation of pile driving noise, or by the application of alternative foundation concepts. The presentation will give an overview on both, existing noise mitigation techniques for impact pile driving and alternative foundation types and will give a brief overview on the experience that could be gained so far. It will illustrate the potential for noise mitigation and the stage of development of technical noise mitigation measures like bubble curtains (BC) (big BC, little BC, confined BC, bubble stick), pile sleeves (noise mitigation screen, pile-in-pile driving, tube casing), cofferdams, hydro sound dampers, and other technical measures. Emphasis will be laid on the frequency dependence of the respective noise mitigation that can be achieved. Furthermore, alternative foundation concepts like drilling, gravity based foundations, swimming foundations and suction buckets will be presented and their respective pros- and cons will be discussed.
Alternative Quieter Technologies to Seismic Airguns for Collecting Geophysical Data

Lindy Weilgart, Dalhousie University, Canada

Seismic airgun surveys, used to find oil and gas deposits under the ocean floor, produce loud, sharp onset, high rise-time (sounds quickly increasing in loudness) impulses that can raise noise levels substantially over large ocean areas. Airguns can be recorded 4000 km away from seismic vessels, and in some locations were heard 80-95% of the days/month throughout the year in over a decade of recordings (Nieukirk et al. 2012). At times, airguns obliterated any biological sounds and formed a ubiquitous, dominant part of the background noise.

Most marine animals rely on sound for their vital life functions, including communication, mating, prey and predator detection, and orientation. Noise impacts from airgun surveys on fish, marine mammals, and invertebrates are well-documented, and range from hearing or organ damage, displacement from important areas, reductions in fisheries catch rates, masking or obscuring of sounds, and behavioral effects such as changes in calls.

Airguns still have considerable energy in the tens of kHz, yet geophysicists do not make use of any energy over about 100 Hz. Thus, this energy is wasted and may unnecessarily impact marine life, especially those animals with mid- or high-frequency hearing. One solution, undertaken by Bolt Technology Corp. and WesternGeco, is the E-source airgun, where the bandwidth is controlled such that output is optimized in the seismic band, but high-frequency energy is suppressed to reduce environmental impact. Another, perhaps more comprehensive alternative is marine vibroseis, where unwanted higher frequencies are also minimized while still producing satisfactory geophysical results. Since marine vibroseis is a non-impulsive source without a high rise-time (thought to be a biologically damaging characteristic), there is a greater chance that this technology will be better tolerated by marine life and that the potential for hearing damage will be reduced (Weilgart 2010, 2012).

Marine vibroseis also uses lower peak pressure, meaning the radius of impact should be drastically smaller, as high peak pressure is also considered harmful to marine life. A typical airgun array would produce impulses in the downward direction at an effective source level of about 255 dB (0-p), whereas the corresponding vibroseis array would have an effective source level of around 223 dB rms (Bird 2003)—a 32 dB difference. The same geophysically useful energy of a 10-ms airgun pulse would be spread over a longer duration to, for instance, a 1-s vibroseis pulse, meaning it could be 100 times quieter, resulting in a roughly 10,000-fold reduction in the area affected in the near field (Weilgart 2010, 2012). Based on a modelling effort (LGL and MAI 2011), a marine vibroseis survey would thus expose only about 1-20% of the whales and dolphins to high sound levels compared with an airgun survey.

The operating depth is more flexible for marine vibroseis than for airguns, so that exposures to sensitive animals may be reduced in this way. For instance, marine vibroseis can be operated in deeper water (at least 100 m) than airguns (usually towed at up to 8 m), thus reducing the possible impact to animals near the surface (LGL and MAI 2011). In shallow water, a marine vibroseis source would generate a considerably lower peak pressure on the bottom than airguns, which could benefit bottom-dwelling marine life. The output characteristics of the vibroseis signal may be better controlled than airguns, such that seismic information could possibly be extracted using lower source levels (LGL and MAI 2011). Pseudo-random noise could be used as vibroseis output signals, allowing potentially yet a greater reduction in peak pressure (source level).
The greatest disadvantage of marine vibroseis compared with airguns is the greater potential for masking, given the longer duration of each pulse. This would affect mainly low-frequency hearing specialists such as baleen whales and some fish. Slight masking effects could occur to a few tens of kilometers from the vibroseis survey. However, if narrow-band FM sweeps are used instead of pseudo-random noise as marine vibroseis signals, masking may be more limited. Airgun signals become stretched (longer in duration) over larger distances as well, thus causing more masking than is initially apparent. Sometimes, noise levels do not return to baseline in the 10 s between airgun shots because of reverberation from the previous shot (Weilgart 2010).

Preliminary tests on fish and shrimp show that marine vibroseis does not cause obvious injury (LGL and MAI 2011). More studies need to be carried out, however, before marine vibroseis can be definitively shown to be more environmentally benign compared to airguns with regard to most important ecosystem components. Options for vibroseis signals (pseudo-random noise vs. FM sweeps) also need to be carefully evaluated for minimum impact on the most species.

Overall, however, marine vibroseis surveys would be expected to cause less of an impact (behavioral, physiological, auditory) than airguns in all habitats and environments regardless of water depth or environmental conditions (LGL and MAI 2011). Mitigation measures for vibroseis surveys may be less restrictive than for airguns, and vibroseis surveys may be allowed in cases where airgun surveys are not.

References


Marine Litter – threats, projects, solutions

Kim Cornelius Detloff, Nature and Biodiversity Conservation Union, Germany

Marine Litter is a global concern causing serious environmental and economical problems in the marine environment. It is not a recent problem, but a problem lost out of sight for too long. It occurs at densely populated coastlines as well as in remote areas far away from obvious sources. Currents, wind and human activities disperse marine debris all over the world. According to UNEP, about 6.4 Million tons of debris ends up in the world’s oceans every year. Plastics and polystyrenes account for approximately 75 per cent of all litter. Millions of marine mammals, birds, turtles and fish die due to entanglement or ingestion of discarded debris. Microplastics, partly contaminated with environmental toxics, have already entered the marine food chain, detected in blues mussels and planktivorous fishes for example. And we do not know about ultimate consequences.

The European Seas, the Mediterranean, the Black Sea, the North and the Baltic Seas, are some of the most industrialized marine areas worldwide. Commercial shipping, fisheries and tourism are the main sources of marine litter there. More than 20,000 tons are discharged yearly into the North Sea alone, similar numbers are supposed for the Baltic Sea. French scientists recently estimated more than 250 billion floating microplastics contaminating the surface of the Mediterranean Sea. In 2008 the European Union adopted the Marine Strategy Framework Directive (MSFD), the environmental pillar of the future European marine policy. For the very first time, member states are obliged, to take all measures that “properties and quantities of marine litter do not cause harm to the coastal and marine environment”. Therefore, marine litter is one of eleven descriptors determining the specific characteristics of the Good Environmental Status (GES) of European waters in 2020. A mammoth task, but a glimmer of hope as well.

In recent years many initiatives, projects and working groups addressing the issue of marine litter have been get off the ground, by science, agencies, NGOs and industries. Just to mention some of them: the EC’s Technical Subgroup on Marine Litter, the Honolulu Declaration, the International Coastal Cleanup Day or Fishing for Litter. NABU, the Nature and Biodiversity Conservation Union Germany, also launched a marine litter project in 2010, coordinating and concentration different approaches at the coast of the German Baltic Sea.

It seems impossible to clean up the seas from all types of litter; and the ecological risk to try it seems unpredictable. We do need more data and scientific research and we do need public awareness campaigns as well as local cleanup activities. But the core problem of marine littering can only be addressed by more fundamental changes. Waste prevention has to rank first; the further entry of debris into the oceans has to be stopped. People have to learn that almost any kind of debris can be raw material and are a valuable resource. Waste management and recycling has to be improved and establishes area-wide and industries have to invest in innovative product design and alternative raw materials. The complexity of the problem and the number of stakeholders, as well as the different levels of action has to be the basis for change and improvement.

This presentation intends to give a brief overview about the rapidly evolving issue of marine litter.
Conflicting Interests between Windfarm Development and the Designation of a Natura 2000 Site: a Belgium Case Study

An Cliquet and Hendrik Schoukens, Ghent University, Belgium

The Belgian marine environment contains only a small part of the North Sea, but is intensively used by different user groups, competing with each other for limited space. In recent years new activities or uses of the sea appeared, leading to an increased tension and conflicts between different user groups, including existing users and new users. In one area, the ‘Vlakte van de Raan’, the conflicting interests were mostly between windfarm development and marine protected areas.

The legal basis for the designation and management of Natura 2000 sites in the Belgian marine environment is the 1999 Law on the protection of the marine environment. In 1999 the first attempts were made to designate marine protected areas, including several Natura 2000 sites. The process can be described as a predominant top-down approach. The attempts failed because of protests alongside the Belgian coast by different user groups, such as fisherman and local communities. In the same period another policy process started, aimed at developing offshore windmill parks. Also this process can be described as mainly a top-down approach. Legislation on offshore windmill parks requires both a concession and an environmental permit. A concession and environmental permit were granted to an electricity firm, in order to develop a windmill park on the Vlakte van de Raan. These plans led to protest from several actors, including a part of the environmental movement.

In 2003 the new Belgian Minister for the North Sea developed a ‘Master plan for the North Sea’. The Master plan consisted of two phases: in the first phase the zones for the ‘hard’ economic activities were designated (offshore windmills and sand and gravel extraction). As a consequence a zone further seawards was designated for offshore windmills. The Vlakte van de Raan was not included and the environmental permit for the construction of the windmill park on the Vlakte van de Raan was abrogated by the government. In the second phase of the Master plan marine protected areas were designated. In 2005 three Special Protection Areas were designated under the Birds Directive and two Special Areas of Conservation under the Habitats Directive, including the site Vlakte van de Raan. The electricity company started a legal procedure against this designation and in 2008 the Belgian Council of State annulled the designation. The argument by the Council was a lack of motivation for the designation of the site. However, this site was already included in the list of Sites of Community Importance in 2008. According to the Habitats Directive Member States then have a period of maximum six years to designate the site as a Special Area of Conservation, and establish priorities and take measures for the conservation of the site.

In 2009 a scientific report was written on the designation of additional Special Areas of Conservation (SACs) in the marine environment. Two proposals were made in this document: an extension of the existing SAC Trapegeer-Stroombank and the designation of the Vlakte van de Raan. In this report a clear scientific motivation was given for the designation of the site, be it with different coordinates, which partly overlaps with the previously designated Vlakte van de Raan. The policy summary by the federal government of this scientific report only dealt with the first area (Trapegeer-Stroombank). Political priority for designating additional sites is clearly given to the extension of the Trapegeer-Stroombank. However, as the Vlakte van de Raan is included in the Community list, the obligation to designate and protect the areas still rests on the Belgian government.
The Belgian government has now three options. If the Belgian government would not designate the area at the national level, this is a clear infringement of article 4 of the Habitats Directive. Withdrawing the site from the community list is very unlikely. The only legal ground for doing so, might be article 9 of the Habitats Directive, which allows for a declassification where this is warranted by natural developments, which has not been the case. The only feasible option is to have new national legislation that designates the site. In order to prevent a new legal complaint against this designation, a solid (scientific) motivation should be given in the legislation. Based on the scientific information that is now available, this should not be a problem. A problem still raises though on the coordinates of the site. The site that has been proposed in the scientific report overlaps only partly with the first designation. As far as the newer part is concerned, this poses no legal problems, as this can be considered as an extension of the existing site. However, a part of the old designated site is no longer included in the new proposal of the scientific report. It remains doubtful whether the Commission would accept a partly declassification of a Site of Community Importance, included in the Community list. A final problem that might arise is the issues of state liability towards the electricity company, as an environmental permit that was given, had been withdrawn.
Great Barrier Reef Strategic Assessment

Josh Gibson, Jon Day and Kirstin Dobbs, Great Barrier Reef Marine Park Authority, Australia

The Great Barrier Reef is the largest coral reef ecosystem in the world, spanning a length of 2,300km along the coast of Queensland. The diverse range of habitats and extraordinary biodiversity make the Great Barrier Reef one of the richest and most complex natural ecosystems found on earth.

Since the early 1980s areas of the Great Barrier Reef have been progressively included in the Australian Government's Great Barrier Reef Marine Park, which today covers 344,000km². In 1981 the Great Barrier Reef was inscribed on the World Heritage list in recognition of its Outstanding Universal Value, meeting all four natural criteria. The Marine Park incorporates approximately 99.3% of the World Heritage Area, excluding most islands, port areas and some inland waters of Queensland. The Great Barrier Reef supports a wide range of uses, including Indigenous cultural use, tourism, fishing, ports, shipping, defence training activities, recreation and scientific research. The Great Barrier Reef Marine Park and World Heritage Area have, since their inception, provided for sustainable use, consistent with the overriding object to provide for the long term protection and conservation of the environment, biodiversity and heritage values of the Great Barrier Reef Region.

Management of the Great Barrier Reef involves a number of agencies. The Great Barrier Reef Marine Park Authority (GBRMPA) is the primary Australian Government agency responsible for the planning and management of the Great Barrier Reef Marine Park. Various Queensland Government agencies are involved in the management of the Great Barrier Reef and adjoining lands and tidal waters. Joint management arrangements between the Australian and Queensland Governments are formalised and guided by agreements between the Prime Minister of Australia and the Premier of the State of Queensland.

The adaptive, ecosystem-based management approach for the Great Barrier Reef is constantly reviewed and updated in response to new and emerging issues. In 2009, the GBRMPA identified, through the Great Barrier Reef Outlook Report 2009, that the Great Barrier Reef ecosystem is at a crossroad and decisions Australia makes now are likely to determine its long-term future. Climate change, declining water quality from catchment runoff, coastal development and remaining impacts from fishing were identified as the biggest risks to the future of the Reef. Since this 2009 report, emerging issues include increases in shipping activity as a result of port expansions; population growth as a result of expanding urban and industrial activities along the Great Barrier Reef coast; intensification and changes in land use within the Great Barrier Reef catchment; and extreme weather events including flooding and cyclones.

The latest adaptive management measure is the January 2012 formal agreement between the Federal Environment Minister and the GBRMPA to undertake a strategic environmental assessment of the Great Barrier Reef Region. The strategic assessment is one of several actions being carried out in response to concerns raised by the World Heritage Committee about the increasing pressure of urban and industrial development along the Queensland coastline.

The strategic assessment is being carried out under the Australia's Federal Environment Protection and Biodiversity Conservation Act 1999 and will examine the effectiveness of the GBRMPA's management arrangements to protect and conserve values which underpin the Great Barrier Reef's World Heritage listing and Marine Park declaration.
Recognising that many of the major pressures on the Great Barrier Reef ecosystem occur outside the marine environment, a second parallel strategic assessment is being carried out by the State of Queensland. This assessment will examine the effectiveness of arrangements under the Queensland coastal management, planning and development framework to ensure that development occurs sustainably and does not impact unacceptably on the Great Barrier Reef World Heritage Area.

The two strategic assessments will also examine the effectiveness of management arrangements to identify, avoid, mitigate, offset and adaptively manage impacts, including cumulative impacts, on the values of the Great Barrier Reef and will recommend modifications to existing management arrangements if the assessment identifies that Great Barrier Reef values are not being adequately protected.

The decision to undertake two, complementary strategic assessments recognises the need for an integrated ecosystem based approach to management of land and marine environments with the capacity to impact on Great Barrier Reef health and resilience. Combined, the two assessments form a comprehensive strategic assessment of the Great Barrier Reef World Heritage Area.

This presentation will provide an overview of Great Barrier Reef values, factors influencing values, key risks and environmental assessment and management arrangements in place to protect values. It will outline the strategic assessment process, including the terms of reference for the assessment and provide an update on progress to date.
Marine Nature Conservation and Fisheries in Europe
Towards Sustainable Fisheries in Europe

Rainer Froese, GEOMAR, Germany

Global catches stagnate at about 80 million tonnes while global fishing effort is increasing. This means that global fish stocks are declining in abundance. These trends are even more pronounced in European waters. Most European stocks are still overfished with stock sizes near the border to compromised reproduction. For most stocks, Europe will not be able to fulfill international obligations to rebuild stocks to sizes that can produce the maximum sustainable yield. Under reasonable management, catches in Europe could be up to 60% higher than currently, from healthy stocks with highly profitable fisheries. Latest news from the reform process of the Common Fisheries Policy of Europe are not encouraging: a reasonable reform proposal by the European Commission is weakened by resistance in the Council of Agriculture Ministers who will ultimately decide about the reform. The role of the International Council for the Exploration of the Seas (ICES) in the reform process is discussed.
Role of No-take Marine Reserves in the Protection of Marine Biodiversity

Josh Gibson, Darren Cameron Jon Day, Kirstin Dobbs, Mark Read, Randall Owens and David Wachenfeld, Great Barrier Reef Marine Park Authority, Australia

The Great Barrier Reef comprises the world's largest system of coral reefs, together with inter-reefal lagoons, seagrasses, mangroves and open waters. It is an area of extraordinary biodiversity, with 70 distinct bioregions, each with its own distinct plant and animal assemblages and physical features.

The Great Barrier Reef Marine Park zoning plan is the primary management instrument for the protection and management of the area's biodiversity, heritage and use values. In the mid 1990s concerns were raised that the levels of protection provided by the zoning at the time were inadequate to protect the range of biodiversity that existed in the Marine Park. Between 1999 and 2003, the Great Barrier Reef Marine Park Authority undertook a systematic planning and consultative program to develop a new zoning plan for the Marine Park. The primary aim of the program was to better protect the range of biodiversity in the Great Barrier Reef, by increasing the extent of no-take areas and ensuring they included representative examples of all different habitat types. While increasing the protection of biodiversity, a concurrent aim was to maximise the benefits and minimise the negative impacts of the rezoning on the existing users of the Marine Park.

In July 2004 the new zoning plan took effect. It increased the area of no-take zones from 4.6% to 33.3% of the Marine Park and ensured that at least 20 per cent of each of the Great Barrier Reef's 70 bioregions was within a highly protected zone type. It also recognised the importance of connectivity by ensuring examples of habitats, both across and along the continental shelf were included in no-take zones.

While it will take many years to realise the full effects of the rezoning, early indications are positive. The comprehensive network of no-take zones provides protection for species that occur in those habitats, including species of conservation concern. Despite the re-zoning not being implemented for fisheries management purposes, closure areas are also delivering benefits to commercially important species.

The zoning network established by the 2004 Great Barrier Reef rezoning process provides a robust foundation for the protection of biodiversity and makes an important contribution to ecosystem resilience. However, the vulnerability of the marine ecosystems to climate change, coastal development, fishing and catchment runoff continues to underpin the need for integrated management actions which address threats within and external to the ecosystem. Nowhere is this need more evident than the inshore areas of the Great Barrier Reef where multiple pressures at the coastal–marine interface continue to place stress on ecosystem biodiversity and health.

This presentation will provide an overview of the Great Barrier Reef's zoning network, including the biophysical, socio-economic and management operational principles which guided the development of the new zoning plan. It will outline findings from research assessing the ecological effectiveness of the rezoning. This includes benefits to fish populations, reef and non-reef habitats and ecosystem resilience. It will also examine the role of no-take areas in the context of the broader range of management tools employed to protect and manage Great Barrier Reef biodiversity and ecosystem health.
Fisheries Measures in German Natura 2000 Sites

Christian Pusch, Federal Agency for Nature Conservation, Germany

In 2004, Germany has nominated ten Natura 2000 sites in its Exclusive Economic Zone (EEZ) of the North and Baltic Seas to comply with the requirements of the EU Habitats (92/43/EEC) and Birds (2009/147/EC) Directives. The sites, covering an area of ca. 31% of the German EEZ, were adopted by the European Commission as Sites of Community Importance (SCIs) in November 2007. Appropriate management measures within the protected areas is therefore due by the end of 2013. In a three years project, performed by ICES and the German Federal Agency for Nature Conservation (BfN), the main conflicts between fishing activities and conservation objectives in the marine Natura 2000 sites have been analyzed. In a subsequent advice produced by ICES in 2008 the following three main conflict areas have been identified: (1) impacts of mobile bottom-contacting fishing gears on reef and sandbank habitats and their typical benthic species in the North Sea; (2) bycatch of seabirds in static gears, especially bottom set gillnets and entangling nets in the Baltic Sea; (3) bycatch of harbour porpoise in static gears, mainly bottom set gillnets and entangling nets in the North and Baltic seas.

On the basis of this advice, a joint working group of the German Federal Agency for Nature Conservation (BfN) and the fisheries research institute (Johann Heinrich von Thünen Institute, vTI) established by the German ministries for environment (BMU) and for fisheries (BMELV), has identified specific management recommendations. The presentation will elucidate the process of analyzing the main conflict fields between fishing activities and conservation objectives for each of the Natura 2000 sites. An update will be given on the current state of affairs for the development of an agreed German proposal to the European Commission for fisheries management measures in marine Natura 2000-sites in the German EEZ.
Fisheries Measures in Natura2000 sites in the Dutch North Sea

Hans Nieuwenhuis, Ministry of Agriculture, Nature Conservation and Food Quality, The Netherlands

This presentation gives an overview of the process for managing fisheries in 5 marine Natura 2000 sites in the Netherlands. It provides insight how two European regulatory frameworks can be reconciled: Natura 2000 and the European Common Fisheries Policy.

It first describes the fisheries management process for two sites in the coastal zone (VIBEG agreement): How were stakeholders involved in designing the measures? What outcome was achieved? How is it currently being implemented?

It subsequently deals with the process for designing fisheries measures for three sites in the EEZ (the FIMPAS project): How was scientific and stakeholder information used? How was international consultation achieved? And what is the current state of play?

Although the regulatory processes are still underway, some important lessons learned are drawn.
Development of alternative fishing gear in small-scale coastal fisheries

Sara Königson and Sven-Gunnar Lunneryd, University of Agriculture Science, Sweden

In the Swedish small-scale and coastal fisheries alternative fishing gear has been and are still being developed. The main reason for the development is the increasing seal and fisheries conflict. There is a need to protect catch and fishing gear from damages caused by seals. Nevertheless there are many other reasons for why there is a need to develop alternative fishing gear. The environmental impact of alternative fishing gear is considered less severe compared to traditional fishing methods. For example bycatch of marine mammals, birds and non-target species can be reduced as well as the fuel consumption and ghostfishing. Another equally important reason is that the small-scale coastal fisheries, a fisheries suffering of low profitability and with no renewal of young fishers, needs a positive development.

All these factors need to be taken into regard when developing alternative fishing gear. Our first priority has been to study the alternative fishing gears fishing efficiency, if the catches from the alternative fishing gear are comparable to traditional fishing gear. In this work it is included not only to compare the fishing efficiency but also to study what variables can affect the catch and how we can increase the fishing gears fishing efficient by. The next priority is the environmental impact, such as increasing the fishing gears size selectivity and decreasing the bycatch of marine mammals and birds. The last part of the work has been to develop seal safe constructions of the alternative fishing gear and thereafter try out if they can resist raids by seals. Handling and practicality of the pots is also needed to be taken into account.

An example of alternative fishing gear which are being developed are cod pots. Cod pots have shown an economical potential as an alternative fishing gear compared with gillnets in the central Baltic. However, the catch efficiency of pots varies with season. When extrapolating catch per pot from test fishing to the number of pots possible to use in a commercial pot fishery results show that in the spring, pots catch less than gillnets however in the fall, catch from the pots increase and is comparable or during certain months even higher than catch from the gillnet fisheries. Decreasing the environmental impact such as decreased bycatch of marine mammals is possible if seal excluder devices (SED) are used. Our study showed that by placing a rigid oval frame and thereby decreasing the entrance to the pot, catch of cod actually increase compared to pots without a SED. At the same time the bycatch of marine mammals is effectively eliminated. Selectivity panels do reduce the catch of undersized cod and ghostfishing can be prevented by placing degradable panels in the side of the pot. A problem that needs to be taken into account is that pots catch fish with lower condition (leaner fish) than gillnets. However pots have the advantage of catching fish with better quality as the fish are caught alive and has no damages from nets. In order to reduce this potential problem, future development of pot fisheries needs to take in to account the individual behaviour of fish, seasonal changes in the status of the stock, and possibly also methods which increase the quality of captured fish.

Our main focus this year is to study cod and seal behavior in relation to different pot constructions. This can hopefully give us knowledge how to increase the fishing efficiency by changing the pot construction as well as how different seal-safe constructions withstand raids by seals.
Short Notes/Project Reports
Census of marine Life and the Ocean Biogeographic Information System (OBIS) – where do we go from here? – Future perspectives

Dr. Edward Vanden Berghe, Rutgers University, USA

The Census of Marine Life was a 10-year international effort undertaken to assess the diversity (how many different kinds), distribution (where they live), and abundance (how many) of marine life—a task never before attempted on this scale. The Census stimulated the discipline of marine science by tackling these issues globally, and engaging some 2,700 scientists from around the globe, who participated in 540 expeditions and countless hours of land-based research. The scientific results were reported on 4 October 2010, at the Royal Institution in London. This first baseline picture of ocean life—past, present, and future—can be used to forecast, measure, and understand changes in the global marine environment, as well as to inform the management and conservation of marine resources. The Census investigated life in the global ocean from microbes to whales, from top to bottom, from pole to pole, bringing together the world’s preeminent marine biologists, who shared ideas, data, and results. During their 10 years of discovery, Census scientists discovered new species, habitats, and connections and unlocked many of the ocean’s long-held secrets. They found and formally described more than 1,200 new marine species, with another 5,000 or more in the pipeline awaiting formal description.

The Ocean Biogeographic Information System (OBIS) was created in 2000 as the data integration component of the Census. Since then, OBIS has grown beyond its original scope and now integrates data from many sources, over a wide range of marine themes, from poles to the equator, from microbes to whales. It is now the world’s largest online repository of georeferenced data, providing access to data of well over 1,000 individual sources, and a total of over 30 million species distribution records. Its datasets are integrated so they can be seamlessly searched by species name, higher taxonomic level, geographic area, depth, and time. OBIS allows users to identify biodiversity hotspots and large-scale ecological patterns, analyse distributions of species over time and space, and plot species’ locations with temperature, salinity, and depth. A global network of Regional and Thematic OBIS Nodes assures the worldwide scientific support needed to fulfil its global mission. Strong ties exist with many of the important international environmental organizations, such as the Global Biodiversity Information Facility (GBIF), the Encyclopedia of Life, the Convention for Biological Diversity, the Food and Agricultural Organization, and many others.

OBIS aims to stimulate taxonomic and systematic research, and generate new hypotheses concerning evolutionary processes, maintenance of species distributions, and roles of marine organisms in marine ecosystems. It serves as a basis for informed management of marine biodiversity by making data freely accessible over the Internet and interoperable with other data systems; some of the uses made of OBIS in this respect will be illustrated. The content of the OBIS holdings is explored, and recent published analyses will be referred to. Unfortunately, not everything is good news. Mobilising adequate resources to run OBIS such that it is able to deliver the services it should has been a constant struggle. OBIS was formally created as a project, and was expected to gain funding in competition with other scientific projects. But this model is a poor match for initiative like OBIS, which really are part of the international scientific infrastructure. These challenges and opportunities will be discussed during the presentation.
Seabed Mapping and its Contribution to the Goal of Sustainable Management in the Ocean

Phil Weaver and Veerle Huvenne, National Oceanography Centre, Southampton, United Kingdom

The pressure on the oceans is increasing dramatically with over one billion people depending on fish as their primary source of protein, hydrocarbon exploitation extending to over 2000 metres water depth and the minerals mining sector gearing up to exploit metals from a number of ocean environments. Within the territorial waters of coastal states there is usually legislation in place to control the environmental impacts of these activities, although the level of legislation may vary considerably from country to country. In the open ocean - areas beyond national jurisdiction - the regulations are approved by the United Nations and its constituent bodies via consensus. In all offshore areas the aim is to build up as much geographic information as possible on the environment, so as to identify different habitats and then to use scientific information to understand the species relationships within the habitats and the effect of the human impact. There are several good examples of marine spatial planning where swath bathymetry has been used as a base map, to which is added reflectivity data to give seabed type (hard, soft, sandy), and then sampling and seabed photography to provide the verification of habitat type. The legislation must then be used to determine the acceptable level of impact on the environment, as well as on the target and non the target species in the case of fisheries.

Thus spatial planning and sustainable management rely heavily on scientific input and especially seabed mapping. For most of the ocean however, including the majority of areas within national jurisdiction, maps at sufficient resolution do not exist. Even in Europe the coverage of swath-mapped areas is poor and there has been no systematic Europe-wide initiative to create offshore maps. This makes it extremely difficult to achieve a spatial plan and very difficult to suggest and impose any regulation since this needs to be evidence based. In many cases the legislative documents call for the use of, or collection of, marine scientific data, but the rate of collection of such data is very low compared to the rate of exploitation by fisheries, and other users. This is because it is expensive to collect the data. In shallow water areas the data collection rate is very slow but the equipment needed is relatively inexpensive e.g. small vessels. Conversely, in deep water large expensive ships are needed, but the collection rate of bathymetry is much faster because the width of the swath of bathymetry data increases with water depth. Data collection becomes an even greater problem in remote areas due to the long transit times required to get there. In areas near to shore there are likely to be multiple activities each of which may contribute to a regional habitat map, whilst offshore it is likely to be only scientists or occasionally fishery vessels that contribute any habitat mapping.

One option to gather information, in the absence of detailed bathymetry and habitat mapping, is to use predictive habitat modelling. Here all the known parameters that control the distribution of a key species e.g. cold-water corals, are plotted on a map to identify areas where the species may be expected to occur. These predictive maps can be used to focus real mapping efforts or, using the precautionary principle, used to limit commercial activities that might impact the vulnerable habitat even without the mapping. Results from a recent offshore survey in the Hatton-Rockall area of the NE Atlantic show that it is difficult to predict areas that need protection in regions where commercial activity (bottom fishing in this case) is ongoing, unless photographic surveys are carried out. These are expensive and cover very small areas of seafloor.
Science is therefore being asked to contribute more, but with very tight and reducing budgets and little prioritisation by funding agencies. If science cannot fill the gap then it will need to be filled by a partnership between science and industry, with offshore industries collecting more environmental data and working with scientists to create sustainable management plans.
Reduction of light emissions of an offshore oil platform to minimize impact on bird migration

Marc Reichenbach and Heiner Mattfeld, Arsu GmbH, Germany

Birds migrating by night are attracted by large-scale artificial light sources, especially when visibility is poor. This leads to impairments for bird life in form of attraction, disorientation, dissipation of energy, collisions and increased decimation by predators. This phenomenon is particularly problematic in offshore regions.

The artificial island Mittelplate – an offshore oil drilling and production platform – is located 7 km off the coast of Schleswig-Holstein within the national park of the Wadden Sea. In order to minimize the impact on bird migration the lighting facilities on the Mittelplate were optimised with regard to light emissions into the surroundings. Photographs were taken in darkness subject to identical conditions before and after implementation of the optimisation measures to document the success of the relevant measures.

In strict compliance with safety at work rules and regulations, by implementing these measures it was possible to achieve a significant reduction of light emissions which is thought to reduce attraction of nightly migrating birds. The use of green light instead or additionally, which had been used at a Dutch offshore platform, was considered not to be sufficiently scientifically verified because of inconsistent study results.
Offshore cavernous boulder reefs in shallow waters host a high biodiversity and are a rare and biological important subtype of the reef habitat at the national and European level. In Denmark, cavernous boulder reefs in shallow waters have been extensively exploited habitats, targeted for easy-to-excavate large boulders suitable for constructing sea defences and harbour jetties. This has destroyed many important habitats with high biodiversity and with cave dwelling species.

A restoration project for a boulder reef has been initiated at Læsø Trindel in the Northern Kattegat supported by EU Life funds.

The main objective of the Blue Reef LIFE project is to:

- Restore and maintain a favourable conservation status
- Restoration of the structure and function of the cavernous element of the shallow offshore boulder reefs
- Stabilisation of the top of the existing boulder reef. The boulder reef is influenced by increased deterioration due to the past excavation of the large stabilising boulders
- Increased awareness among environmental managers, policymakers and the broader public on marine nature restoration, conservation and management issues

The project was initiated in 2006 with baseline studies describing the existing hardbottom flora and fauna on the seabed as well as the fish community on the reef. In 2008, 100.326 tons of boulders from a quarry in Norway was shipped down and deployed on 4.5 ha on Læsø Trindel. An extensive surveillance program have followed the colonization of new species in the past three years and in the summer 2012 a large scale investigation will take place evaluating the biological benefit of the project in terms of benthic algal and fauna species as well as fish associated to the reef.

Along with the Life funded restoration project, Aarhus University initiated a study on harbor porpoise activity at the Læsø Trindel reef. To investigate whether porpoises are attracted to the restored reef areas, their acoustic activity was monitored by static acoustic loggers, T-PODs, before and after the restoration project. T-PODs (Timing Porpoise Detectors) detect the echolocating signals of porpoises and other odontocetes. Two T-PODs (Version 3) were placed at the Læsø Trindel reef and another two at a reference reef 10 km away, during the summers from 2006 to 2010. Results showed that porpoise activity increased significantly at the Læsø Trindel reef after the reconstruction in 2008. PPM (a minute with a click detection) increased from 6.9 day\(^{-1}\) before, to 15.0 day\(^{-1}\) after 2008 (118 % increase). At the same time activity decreased in the reference area from 12.6 to 4.6 PPM day\(^{-1}\) (64 % decrease). Porpoises not only appeared more often, but also stayed longer at Læsø Trindel: encounter durations increased by 59 % from 2.9 to 4.6 min (where an encounter is defined as a series of porpoise clicks of any length with silent periods less than 10 minutes). Furthermore, there was a striking diel pattern in porpoise activity at Læsø Trindel where most activity occurred during the night. At the reference site, in contrast, most activity took place at daytime. It is argued that these changes might reflect a new food source appearing at night on the re-established boulder reef, and fed upon by the porpoises. The final studies on fish community that is to be conducted in 2012 will hopefully be able to answer this question.
Conference Announcements and Presentations of new marine Films/Books
Protecting European Seas: “Designating MPAs in the Baltic and the Mediterranean”

Nicolas Fournier, Oceana, Belgium

In this crucial year for marine conservation, it is fair to recognize that efforts to establish a network of well managed Marine Protected Areas (MPAs) in Europe have fallen short of ambitions. Most of our waters are still unprotected and the majority of EU Member States lags behind international targets.

More alarming is the delay in establishing network of MPAs as their environmental benefits are often only detectable after a few years and build up over time to become more evident the longer the MPA remains functional.

Oceana advocates for and supports the creation of MPAs as an effective conservation and fisheries management tool. Using scientific expeditions to support the identification of areas to propose for MPA designation, Oceana’s successful approach is broad enough to apply to the Mediterranean and the Baltic Seas, despite their political, geographical and ecological differences.

This is how Oceana’s MedNet and Baltic conservation proposals were developed, to fully embrace the precautionary principle and bridge the science-policy gap. Oceana values a holistic approach to the establishment of MPA networks, engaging international cooperation and taking into account ecological coherence and connectivity at regional level.

Both proposals demonstrate that despite limited knowledge, recent advances in marine research allow us to act immediately to protect important marine features. We are now able to comprehensively document and assess ecologically important areas, vulnerable marine habitats and species as well as the associated impacts and threats from human activities. Simple compiling and integration of these data offer a good basis for strategic planning and initiating effective spatial protection measures.
European Marine Strategy Framework Directive (MSFD)
On 15 July 2008, the European Marine Strategy Framework Directive (2008/56/EC; MSFD) came into force as the environmental pillar of the maritime policy for the European Union. Targets of the MSFD are the protection of the marine environment, the sustainable use of marine goods and services as well as the achievement of good environmental status in all European seas by 2020 and its sustainable maintenance. These targets shall be achieved by setting up programmes of measures that fulfill the application of an ecosystem-based approach, the precautionary and polluter pays-principle as well as a coherent and integrative approach within the respective marine regions.

The MSFD can be implemented in a pragmatic way, when a consistent procedure coordinated on a regional and pan-European level for the preparatory steps is chosen (compare Krause et al., 2011). A successive approach by taking into account the principles of nature conservation would allow for taking the chances given by the MSFD to reach or maintain a good environmental status in the seas. The preparatory steps, specified by the Directive itself, include an (initial) assessment of the actual status of the national marine waters (Article 8 to the MSFD). This assessment addresses essential features and characteristics, predominant pressures and impacts as well as economic and social aspects. The second step is the determination of good environmental status (Article 9 to the MSFD), or in other words, the definition of how the good status of the marine waters looks like. The comparison of the actual and desired status does then lead to the establishment of environmental targets (Article 10 to the MSFD). These should guide progress towards achieving (or maintaining) good environmental status and preferably refer to manageable pressures but also include supporting biodiversity related targets.

These three steps have to be reported to the European Commission in 6-year cycles and for the first time on 15 July 2012. Therefore, Germany started with the drafting and consultation process between institutions and ministries of the Federal government and the Federal States in April 2010. All reports, three for the German North Sea and three for the German Baltic Sea, have been in public consultation for 6 months and were adjusted afterwards before sending them off to the European Commission. Currently these written reports are transferred into data reporting sheets.

The next step in the implementation process is to establish and implement monitoring programmes (Article 11 to the MSFD). These shall help and complement in the ongoing assessment procedure (the next assessment of the status has to be made in 2018) but also check the achievement of the environmental targets. A third task is to monitor the efficiency of programmes of measures. The programmes of measures are a core item of the Directive and have to be set up to reach or maintain good environmental status in the marine waters.

In Germany the initial steps in preparing the monitoring programmes and programmes of measures have been made. According to the MSFD, the programmes have to be developed in 2014 and 2015, respectively.

The presentation will show what the implementation of the MSFD in Germany means in practice. In doing so, it will present the results of the first three steps in the implementation
process - the (initial) assessment of state, the determination of the desired state and the establishment of environmental targets - and will give an initial view on the development of monitoring programmes and programmes of measures.

References:
Status Quo of the European Marine Strategy Directive (MSFD) in the Netherlands

An introduction on the Dutch approach to the implementation process

Wim van Urk, Ministry of Infrastructure and the Environment, The Netherlands

The presentation will highlight the approach the Netherlands is taking on the implementation of the MSFD, as elaborated in the Draft Marine Strategy for the Dutch Part of the North Sea, Part I. The Dutch Government aims, for the current and future generations, towards having a good environmental status and biodiversity in the North Sea and to secure it as an important source for the economy and food security. The Marine Strategy Part I sets the course for the activities to be undertaken between 2012 and 2015.

Abstract

The Dutch Marine Strategy for the Dutch part of the North Sea adds to the elaboration of the National Water Plan (NWP, 2009). The NWP plan sets the (spatial) conditions for sustainable, space-efficient and safe use of the Dutch part of the North Sea, in balance with the marine ecosystem as framed by the Water Framework Directive (WFD), MSFD and the Bird and Habitat Directives (BHD).

The Marine Strategy Part I consists of the initial assessment of the marine ecosystem, the environmental targets for 2020 towards reaching the good environmental status, and related indicators for monitoring, as required by the MSFD. It also contains the additional policy requirements wherever needed, as the first step towards the decision on the program of measures in 2015. Furthermore does the Marine Strategy Part I contain the knowledge agenda accompanying the implementation of the MSFD.

The Dutch government opts for a sober and pragmatic approach, focusing on the greatest risks for the marine ecosystem and on the best opportunities for sustainable use up till 2020 and beyond. The Marine Strategy complements existing and prospective national policies, including implementation of international treaties and framework directives. Such existing policies include the WFD, OSPAR, BHD, Common Fisheries Policy, ASCOBANS, MARPOL and the existing framework for licensing of activities. If needed to reach good environmental status, new policy assignments and measures are formulated.

An ecosystem approach forms – together with the application of the precautionary principle – the core for establishing the complementary policy assignments and the program of measures. Adaptive management enables opportunities for learning and making policy adjustments “on the move”. This is facilitated by the monitoring program and the formal six yearly revisions of the Strategy. This process will be further fed in by the continued exchange of experiences in international multi- and bilateral settings (EU, OSPAR, sub-regional) and the research programming of the Strategy. This adaptive approach, hence, does allow for interim adjustments to targets, policies, measures or indicators for monitoring if needed.

Designing the Dutch Marine Strategy was done in broad consultation with as many as possible stakeholders and with scientific knowledge institutions. Furthermore the strategy was shared and tested both multilaterally in OSPAR and EU platforms and bilaterally with neighbouring countries. Also the feedback from the public consultation was taken into account.

The aim is to implement the Marine Strategy in an international context and legislative frameworks (for synergy, coherence, cost effectiveness), notably the EU, OSPAR and IMO.
and with the neighbouring countries of the North Sea sub-region. The undertaking is placed in the context of the Dutch sustainability agenda (‘green growth’): capitalizing on opportunities for (economic) development and innovation and societal initiatives, is preferred above exclusion and regulating.

**Highlights from the initial assessment**

An inventory of ecological values and threats is drawn up, as well as an inventory up of existing policies and their effectiveness. The present environmental situation is described in detail as well as a projection of the situation in 2020 and beyond, based on current scientific knowledge and insights from as many stakeholders as possible.

One conclusion is that positive developments have been recorded for the North Sea and existing policies have shown to be effective. Populations of some commercial fish species are faring better than in the recent past. The abundance of marine mammals show a positive trend, pollution and eutrophication levels have dropped significantly. However, the other conclusion is that the current condition of the North Sea’s marine ecosystem is still such that the natural structure and functions of the marine ecosystem are by no means secured yet. Especially the traditional bottom trawling fisheries have altered or damaged seabed habitats and over vast areas even led to disappearance of vulnerable structures. The survival of some fish and other bottom species is being threatened or species no longer occur. A decline in several bird species has been observed.

**Overview of the needs for additional policy towards good environmental status (on top of current policies), and knowledge assignments**

<table>
<thead>
<tr>
<th>Category</th>
<th>Additional policy assignment</th>
<th>Knowledge assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine Ecosystem</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Non-indigenous species</td>
<td>No additional policy assignment</td>
<td></td>
</tr>
<tr>
<td>Eutrophication</td>
<td>No additional policy assignment; Yes</td>
<td></td>
</tr>
<tr>
<td>Hydrographic characteristics</td>
<td>No additional policy assignment; Yes</td>
<td></td>
</tr>
<tr>
<td>(Chemical) Pollution</td>
<td>No additional policy assignment;</td>
<td></td>
</tr>
<tr>
<td>(Chemical) pollution in fish products</td>
<td>No additional policy assignment</td>
<td></td>
</tr>
<tr>
<td>Marine litter</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Underwater noise</td>
<td>No additional policy assignment; Yes</td>
<td></td>
</tr>
</tbody>
</table>
Economic Aspects of the MSFD: Why and how to estimate the Benefits of Measures?

Eduard Interwies and Stefan Görlitz, InterSus - Sustainability Services, Germany

In June 2008, the Marine Strategy Framework Directive (2008/56/EC - MSFD) of the European Parliament and of the Council was published. This Directive obliges the Member States to achieve or maintain “Good Environmental Status” (GES) in their marine environments by the year 2020 at the latest. It establishes a framework for community action in the field of marine environmental policy, expanding the EU Water Policy to encompass all European waters. At the same time, the MSFD represents the environmental pillar of the integrated EU maritime policy (“Blue book”).

For the purpose of achieving or maintaining GES, marine strategies containing programs of measures shall be developed and implemented in order to protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected. Prior to implementing such measures, however, the MSFD requires the Member States to conduct Impact Assessments, including Cost-Benefit-Analyses (CBA). In this context, the economic estimation of (environmental) benefits is highly challenging.

Theoretical concepts for conducting such economic estimations exist in abundance, the lack of quantifiable data, however, results in the need of combining quantitative and qualitative information (e.g. through multi-criteria analysis). To give more political weight to economic estimations of environmental benefits, further development of methodologies and a reliable data base are necessary.

The German Federal Environment Agency’s research project “Methodological basis for socio-economic analyses and assessment of the impact of measures including cost-benefit analysis in accordance with European Marine Strategy Framework Directive”, led by InterSus - Sustainability Services, aims at closing parts of the “methodology gap”, through developing a methodological basis and “Practitioner’s Guidebook” for the evaluation of benefits of maritime protection measures.

The presentation of Mr. Interwies and Mr. Görlitz of InterSus will highlight the background regarding economics in the MSFD and most important findings and current state of the research project, focusing on:

- Results of the project’s case studies: evaluating the economic benefits of maritime protection measures targeting “eutrophication” and “marine litter”.

- Conclusion for the practical implementation of these findings, and for creating a “Practitioner’s Guidebook”.

43
Protection of Marine Endangered Species
Oyster reef restoration in Europe- restoration of a missing habitat

Janet H. Brown, The Shellfish Team, United Kingdom
Elizabeth C. Ashton, University of Stirling, United Kingdom

The history of native oysters in Europe has been one of exploitation and intensive management, and since the 1870s, attempts at restoration. These attempts included introductions from France and Holland and even exotic species from the USA with consequent disease and pest introductions. Restoration by means of hatchery production or by moving spat from settlement grounds, as was the basis of the oyster industry, means that the oyster can never settle and grow in its natural form. That is if it is unable to settle naturally and where it prefers, i.e. on another oyster, it can never form natural reefs. Indeed, the formation of reefs would be a disadvantage if the aim is to market a perfectly formed round oyster. This talk will however argue that such natural reefs, were they allowed to develop again would by their stability and form provide untold opportunities for encouraging biodiversity and increasing marine productivity.

This presentation discusses how restoration should aim not to recover a once valuable fishery but instead to recover a far more valuable habitat that could also potentially be of value to the oysters themselves. Many of such ecosystem benefits have been studied in USA. It will report on preliminary work in this area in the UK, the particular requirements for restoration of this type and discuss what might usefully be investigated for a pan-European project. The talk will show visual evidence of the biodiversity benefits that could ensue from reef restoration and also raise more serious questions as to whether the loss of recruitment that led to the early restoration attempts of the 1870s was entirely due to overfishing of the inshore stocks and the development of the railway, as often supposed, or could in fact have been due to the exploitation of the deep reefs of the North sea and English Channel at the time. This then raises the possibility of far more radical solutions being needed.

Many of the ecosystem benefits that shellfish provide in terms of water clarification and excess nutrient sequestration can be provided by shellfish aquaculture which as well provides a safe and health giving food. The benefits for restoring the natural form of native oysters that once provided a vast and stable habitat around European seas however is potentially of even greater value. This is something that must be considered when thinking of Marine Protected Areas and marine spatial planning and could be carried out alongside suitable fisheries or aquaculture.
Mediterranean monk seal conservation. The role of Marine Protected Areas and ‘horizontal’ measures for the preservation of the species in Hellenic seas

Vangelis Paravas and Dr. Panos Dendrinos, Hellenic Society for the Study and Protection of the Mediterranean Monk Seal, Greece

Hellenic seas are currently hosting the largest Mediterranean monk seal (Monachus monachus) population throughout the range of the species, which covers the whole Mediterranean basin, as well as the Atlantic coasts of Mauritania and the volcanic island archipelago of Madeira in the eastern Atlantic Ocean. Despite the aforementioned fact, the population guesstimate for the species in Greece is alarmingly low, assessing no more than 350 individuals. The latter is the major argument which has placed the Mediterranean monk seals under the critical endangered species category in the IUCN red lists of threatened species. However, the species is more than persistent and is still widely distributed nearly across all insular and mainland coastline of the country.

Nevertheless, its conservation status is hampered by substantial and constant pressures, its populations facing mostly, if not solely, anthropogenic threats, such as habitat destruction and human related mortality. During the past 24 years MOm, the Hellenic Society for the Study and Protection of the Monk Seal, has been actively involved in activities focusing on scientific research of the species, on design and proposition of legislation to mitigate the alarming species decline, on demanding strict measures taken against direct and serious threats, and on implementing numerous in situ conservation actions.

The up-to-date picture of Mediterranean monk seal conservation in Greece is based on a double-axis approach, stemming both by the establishment and operation of Marine Protected Areas, as well as the implementation of conventional ‘horizontal’ conservation measures. Both approaches have their successes and strengths, but also their defects and weaknesses. In principle their results act supplementary to each other, however their successful implementation is hindered by numerous ecological, but also socio-economic factors. This presentation will demonstrate the Hellenic experience and the rationale behind the efforts aiming at the preservation of the most endangered marine mammal in the European Union.
Conservation plan for the Harbour Porpoise (*Phocoena phocoena*) in The Netherlands: towards a favourable conservation status

C.J. Camphuysen, Royal Netherlands Institute for Sea Research, The Netherlands
M.L. Siemensma, Marine Science & Communication, The Netherlands

In 2011, at the request of the Dutch Ministry of Economics, Agriculture & Innovation, a species conservation plan for the Harbour Porpoise *Phocoena phocoena* was established, based on current seasonal occurrence and abundance of porpoises within waters under Dutch jurisdiction aiming to achieve favourable conservation status. Harbour Porpoises have increased markedly in numbers in the southern North Sea in recent decades. The conservation status of the Harbour Porpoise in The Netherlands has recently been evaluated as ‘Inadequate’, the population as ‘Vulnerable’.

Porpoises are legally protected in The Netherlands following international, European and national legislation. Current policy in The Netherlands doesn't accomplish adequate protection of this species. Implementing the research and mitigation measures, as advised in this plan, serves to get porpoises into the desired conservation status, to fulfill obligations of the relevant international legal treaties.

The conservation plan is generic rather than area-orientated as recent research in Dutch waters failed to identify areas of particular ecological significance for any significant length of time. Based on available scientific evidence and experiences in other countries, mitigation measures and suggestions for urgently needed additional scientific research have been formulated. A stakeholder consultation was part of the project.

It is recommended to establish observer schemes on all passive gear fleets to assess bycatch-rates according to internationally accepted protocols, to investigate alternative gear or set-net modification, to use pingers (controlled) when bycatch is identified, to facilitate bycatch landing, to control illegal fisheries, to amend EC812/2004 and to evaluate effectiveness of mitigation measures.

Regarding adverse effects of impulsive underwater noise (detonation, seismic, pile driving) a system of standards and protocols to mitigate and investigate the impact should be developed and implemented.

A national scientific research group will be established to deal with aspects such as research needs, research quality and evaluation of quality and conclusions of reports.

In 2012 the Ministry of EL&I establishes an action plan to give effect to the recommendations of the conservation plan. The focus will be on: further research prioritized on underwater noise, bycatch, population structure and diet; bycatch mitigation; stakeholder involvement and international cooperation.
The Baltic Sea harbour porpoise (*Phocoena phocoena*). What do we know and what do we need to know?

Jens Koblitz, German Oceanographic Museum, Germany

The harbour porpoise (*Phocoena phocoena*) is the only cetacean species reproducing in the Baltic Sea. Historical records show that it was once so abundant that hunting was profitable.

Animal abundance however decreased over the years and the last two aerial surveys carried out on the Baltic proper in 1995 and 2002 indicate a population of a few hundred animals. About 11,000 porpoises were estimated to inhabit the Baltic Sea based on a ship based survey in 2005. Genetic and morphological studies show the differences between the Baelt Sea and Baltic Proper populations.

Aerial and ship based surveys only give snapshot information on the population and are limited by weather conditions. In addition visual surveys in low density areas not only result in very few sightings but also large confidence intervals. Acoustic monitoring, that is inferring the animals presence based on the recordings of the animal’s echolocation clicks, is not dependent on the weather and provides a high temporal coverage.

The German Oceanographic Museum has been using acoustic monitoring for a decade in the German waters of the Baltic Sea. The recorded data shows that porpoises are present in all parts of the German Baltic Sea. Porpoise presence, described by the number of days when porpoises were detected, however decreases drastically from West to East. Additionally in some areas the porpoise distribution follows a clear seasonal pattern with a higher registration rate of animals in the summer.

Incidental sightings provide additional useful information on porpoise distribution and population range and support the information gathered by visual and acoustic surveys.

Stranded animals can sometimes be used to asses the cause of death and estimate the impact of bycatch on the population.

In the hopes for more reliable data on the whole Baltic Proper porpoise population, scientist and policy makers alike are awaiting the results of the SAMBAH (Static Acoustic Monitoring of the Baltic Sea Harbour porpoise) project. For a total of two years, 300 porpoise click detectors distributed in the EU waters of the Baltic Proper collect data on porpoise presence or absence. In addition with other information such as click rate, click source level and group size, animal abundance and distribution in the Baltic Proper will be calculated.
Recovery of the grey seal (*Halichoerus grypus*) population in the southern Baltic

Anders Galatius, Aarhus University, Denmark

The Baltic Sea grey seal is a distinct population which has different phenology of breeding and moulting to that of Atlantic grey seals. It is thought that there may previously have been as many as 100,000 grey seals in the Baltic Sea and the species used to be distributed throughout the marine area. During the 20th century, anthropogenic impacts, especially hunting and pollution, brought the abundance of Baltic grey seals down to around 2,000 individuals in the late 1970s. Since then pollution with persistent organochlorines has decreased and the seals have enjoyed protection and numbers have steadily increased. However, until recently, the Baltic grey seal distribution was largely limited to areas north of N 58°. During the last 10 years, grey seals have reappeared in the southern Baltic in increasing numbers, especially in southern Sweden and Denmark, but also in Poland and Germany.

This presentation focuses on the results of the Danish marine mammal monitoring programme regarding the grey seal and the future initiatives to understand the impacts of the return of the largest predator to the ecosystem. Seal haul-out sites have in Denmark have been covered by a programme of aerial survey during the pupping and moultin seasons of the harbour seal since 1979. During the last 10 years, irregular surveys have also been performed during the pupping and moultin seasons of the Baltic grey seal, in February/March and May/June, respectively. In 2011 a dedicated monitoring programme of the grey seal in Danish waters commenced. In the Danish and southern Swedish Baltic, we have performed surveys during the grey seal moult in 8 of the last 10 years. Between 2002 and 2009 we obtained counts ranging from 78 to 145 with an increasing trend. In 2010 and 2011 we counted 301 and 766, respectively. The count for 2011 was almost the same as the number of harbour seal counted during the moultin period of this species. Concurrently, we have experienced an increasing amount of reports from fishermen regarding seal conflicts. Further north, in Kattegat, we have never recorded more than 50 seals during any one survey, and it is unclear whether grey seals here are immigrants from the Atlantic or the Baltic.

The first grey seal pups since the reappearance of the grey seal was registered at Rødsand in 2003. Since then, grey seal pups have been observed at Rødsand in most years, the highest number in one year being five. Over the last eight years, two pups have been recorded in Kattegat. Grey seals females are known to be very philopatric with regard to pupping, so reestablishment of a large number of breeding grey seals in Danish waters may prove to be a slow and gradual process. Given the low number of pups born in Danish waters, it is clear that increasing numbers of grey seals are caused by immigration from neighbouring areas. In the Baltic at large, there has been a substantial growth in grey seal numbers during the last 10 years, but recently the increasing trend has leveled off. It is probable that the population is approaching carrying capacity in the inner Baltic, which is a likely explanation for the reappearance of the grey seal in Denmark in large numbers.

As immigration of such numbers of a large predator will have profound impacts on the ecosystem, we are planning to intensify our grey seal research with diet studies, genetics, telemetry and photo identification, in order to assess impacts on fish stocks, competition with harbour seals, contributing areas and conflicts with fisheries.
Threatened Biodiversity in the German North and Baltic Seas
Sensitivities towards Human Activities and the Effects of Climate Change

Ingo Narberhaus, Jochen Krause and Ulrike Bernitt (Eds.)
Bonn, Germany 2012, 628 p., Paperback, € 39,–
Naturschutz und Biologische Vielfalt, Heft 117
ISBN 978-3-7843-4017-3

The seas off Germany’s coasts are under pressure from human induced pollution and, increasingly, from direct human activities in the area – notably fisheries, resource exploration and extraction, and the erection of offshore installations such as wind farms. Furthermore, the impacts of anthropogenic climate change on marine ecosystems are already apparent.

In 2004, ten marine protected areas covering a total of more than 10,000 km² were designated in the German Exclusive Economic Zones of the North and Baltic Seas as a contribution to the Natura 2000 network of protected areas. However, the statutory protection afforded by such designation does not suffice by itself. In response to this challenge, the Federal Agency for Nature Conservation (BfN) is now preparing comprehensive management plans for the protected areas that take all relevant human pressures into account.

The purpose of this book is to provide a scientific foundation for the management plans and to compile the information available on each protected marine species and habitat type. Individual profiles for each conservation feature set out their key biological and ecological characteristics and their distribution and stocks in German territory. Each profile then goes on to identify the specific sensitivities of the features to human activities in marine areas and the anticipated impacts of climate change.

The book assembles the available body of knowledge, making it accessible for practical purposes. With its comprehensive but clearly structured approach, the volume gives experts – and the public – a manual e.g. for conducting assessments within project approval procedures and developing conservation measures in marine areas.

I would like to order, please send invoice:

<table>
<thead>
<tr>
<th>Amount</th>
<th>ISBN</th>
<th>€</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>978-3-7843-4017-3</td>
<td></td>
</tr>
</tbody>
</table>

Return Address:

Name, First name

Street, Nr.

Postcode, town

Date

Signature