Federal Agency for Nature Conservation

Challenges of Marine Nature Conservation

BfN Directorate II 5 Marine Nature Conservation

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Directorate II 5 Marine Nature Conservation

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Title photo:

Common dolphin *(Delphinus delphis)* with a shoal of mackerel.

Photo: Biosphoto/juniors@wildlife.de

Contents

1 Introduction

The increasingly intensive use of our seas makes protecting the marine environment more and more important. This applies just as much in the North Sea and the Baltic Sea as it does across all of the world's oceans. While key progress has been made on reducing marine pollution in recent decades, other problems continue to become increasingly widespread. Overfishing (see Fig. 1), plastic waste in the sea, fishing and deep sea mining in ever more remote marine areas, renewable energy generation, underwater noise and shipping pose growing threats to many marine species and habitats (von Nordheim & Hempel 2017).

Fig. 1: Unintended bycatch of spiny dogfish (photo Avalon/Juniors Wildlife)

Marine nature conservation must strike a delicate balance between the aim of protecting and conserving marine biodiversity and the desire for sustainable, ecosystem-friendly use of the seas for the benefit of humanity. Are there any parts of the oceans still untouched by human influence? Can marine protected areas provide enduring protection to habitats of outstanding ecological significance – or what other, larger-scale ecosystem approaches of fundamental importance are available to govern conservation and exploitation? What is meant by nature-friendly use and which limits apply in which situation?

These are just some of the questions for which marine nature conservation and the Federal Agency for Nature Conservation (BfN) have to seek solutions and answers – an enormous challenge.

The priority task consists of implementing statutory requirements, directives, strategies and international agreements, and closing knowledge gaps. This often requires an incremental approach without losing sight of the big picture. While extraneous conditions dictate the general direction, giving shape and form to the work requires strategic objectives and defined tasks. These have been the focus of marine nature conservation at BfN since 1992. While many successes have been achieved over the intervening years (see section 4), needs and requirements have changed and multiplied in the 25 years since the BfN Marine and Coastal Nature Conservation Division was established on the Isle of Vilm in 1992. The creation of the separate Marine Nature Conservation Directorate in 2016 demonstrates that marine nature conservation has become a very important and extensive part of BfN's work, with a wide variety of activities in science and research, administration and enforcement. This position paper describes how the new Directorate goes about its work and outlines the strategic outlook for the years ahead.

2 Legal framework

Marine nature conservation responsibilities are allocated in Germany along federal lines. Coastal waters within the 12 nautical mile zone are the responsibility of the sixteen German Länder (coastal states). The Federal Government – as represented by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and by BfN as the central scientific nature conservation agency – is responsible for the enforcement of federal laws in the area of the Exclusive Economic Zone (EEZ) and the continental shelf beyond the 12 nautical mile zone, for international cooperation, and for legislation.

For many years, marine nature conservation – and in particular marine nature conservation in the EEZ – was not recognised as a subject of statutory regulation. The impetus for subsequent German legislation came from the EU nature directives – the Habitats Directive (1992) and the Birds Directive (1979, amended 2009) – which apply not only to coastal waters, but also to the EEZ (Czybulka 2011). In 2002, a new Article 38, "Protected Marine Areas in the Exclusive Economic Area and on the Continental Shelf," was added to the Federal Nature Conservation Act (Bundesnaturschutzgesetz, or BNatSChG). This paved the way for the establishment of German marine nature conservation areas in the EEZ and provided the legal basis for implementing Natura 2000 in marine areas within the EEZ (Czybulka 2011), as called for by the European Commission. The Federal Environment Ministry and the Federal Agency for Nature Conservation thus came to be responsible for selecting, designating and managing protected areas in the EEZ.

In a major revision of the Federal Nature Conservation Act that entered into force on 1 March 2010, the legislature gave recognition to the special importance of the marine environment in sustaining living resources for humankind by creating a separate chapter of the Act headed "Marine Nature Conservation" (Daten zur Natur, 2012). Numerous provisions on marine nature conservation were introduced, mostly in Articles 56, 57 and 58 of the Act. It was laid down that all provisions of the Act (with the exception of landscape planning) also apply to the area of the German EEZ and the continental shelf. The provisions in Article 38 of the 2002 Federal Nature Conservation Act were retained in Article 57 of the revised Act and supplemented to meet international conservation obligations under the OSPAR and the Helsinki Convention. Since 2010, additional instruments of nature conservation law such as the stipulations on impact mitigation, species conservation and statutory habitat conservation also apply in the EEZ (Daten zur Natur, 2012). The revision of the Act extended the protection for marine habitats in the list contained in Article 30 to habitats such as "sea-pen and burrowing megafauna communities", "seagrass meadows and other marine macrophyte populations" and "species rich gravel, coarse sand and shell-gravel areas".

In 2010, BfN was appointed as the competent authority for nature conservation within the meaning of Article 58 BNatSchG for the entire German EEZ and continental shelf. Responsibility for enforcement of nature conservation law in coastal waters remains with the Länder.

The provisions of the Federal Nature Conservation Act on marine responsibilities notably serve the purpose of meeting international and European conservation obligations entered into by Germany for its marine areas, such as under the regional marine conservation agreements for the North-East Atlantic and the Baltic Sea (the OSPAR and the Helsinki Convention) and under the European Habitats Directive, Birds Directive (see above) and the relatively recent Marine Strategy Framework Directive (MSFD). Various global conventions now also contain numerous and detailed stipulations on marine nature conservation.

International law in this area centres on the United Nations Convention on the Law of the Sea (UNCLOS, 1994). Often described as a constitution for the oceans, UNCLOS is the most

important source of international law governing human activity in the seas and oceans and creates an obligation for states to protect and preserve the marine environment. Under the Convention on Biological Diversity (CBD), a list is currently being compiled of Ecologically or Biologically Significant Marine Areas (EBSAs) to provide the scientific basis for establishing a global network of marine protected areas.

Further information may be found in, for example, Johnson (2016), von Nordheim (2017 *in press*), Daten zur Natur (2012) and Gellermann et al. (2012).

A comprehensive compilation of European and international agreements, conventions and directives relating to marine areas is provided at https://www.bfn.de/themen/meeresnaturschutz/internationale-aktivitaeten.html (see also Fig. 2).

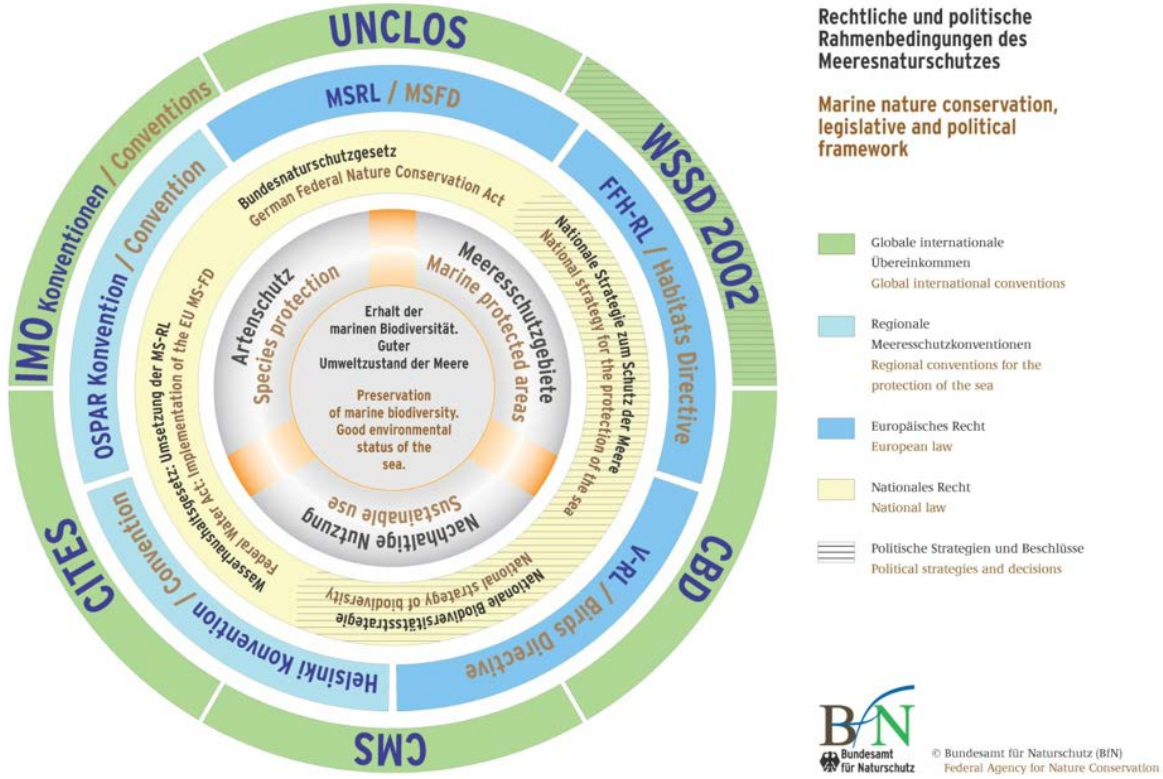

Fig. 2: Marine nature conservation in the legal and policy framework

3 The BfN Marine Nature Conservation Directorate

On 21 March 2016, the Federal Agency for Nature Conservation (BfN) established, under its Section II, the Marine Nature Conservation Directorate on the Isle of Vilm. The previous Marine and Coastal Nature Conservation Division within BfN on the Isle of Vilm was converted to the Directorate II 5 containing three separate divisions. The allocation of responsibilities between the three divisions is described in the BfN organisational plan (Box 1).

Box 1: Structure and responsibilities of the Marine Nature Conservation Directorate (in accordance with the BfN organisational plan)

Section II
Directorate II 5 Marine Nature Conservation (BfN Isle of Vilm)
Division II 5.1: Generals tasks and International Marine Nature Conservation • International marine nature conservation under HELCOM, OSPAR, UNCLOS, CBD, etc. • Surveying and cataloguing habitats; habitat type classification • Marine biodiversity conservation strategies and measures • Integration of marine nature conservation into offshore fishing • Coordinating research and funding • Publications and public relations • IT management **Division II 5.2: Marine Protected Areas, Management and Monitoring** • Administration and management of the German marine protected areas in the EEZ • Marine aspects of the Habitats Directive and Birds Directive • Marine Strategy Framework Directive (MSFD) (international and national implementation) • Biodiversity monitoring and surveillance (incl. diving, underwater video and research trawls) • Databases • GIS/cartography • Invasive marine species • Trilateral Wadden Sea management **Division II 5.3: Human Impacts and Ecological Issues in Marine Activities** • Ecological contributions to the assessment of human activities; impact assessments (Habitats Directive assessments; EIAs) and assessments under international conventions • Assessment of harm to marine biodiversity • Species and habitat conservation in application procedures • Impact avoidance and mitigation; alternative methods • Antarctic Environmental Protocol, CCAMLR, conservation of Antarctic seals, IWC, ASCOBANS • Marine mammals • Hydroacoustics • Contributions to Red Lists • Integrated marine and coastal zone management • Nature conservation-related contributions to marine spatial planning

4 Marine nature conservation milestones since 1992

Numerous international agreements and conventions have been adopted and key steps taken to protect the seas in recent decades, most of all in the years since 1992 (see section 2). Germany is party to most of these agreements and conventions and has committed to their implementation. This played a major part in the decision to establish marine nature conservation as a responsibility of BfN in 1992. International cooperation is essential in any case, especially in marine nature conservation, and effective conservation of marine biodiversity can only be achieved through joint effort.

Many necessary steps, large and small, have already been taken to counter the degradation of marine ecosystems and the loss of marine biodiversity. Table 1 lists the most important milestones marking major advances in marine nature conservation, in the development and implementation of which BfN has been closely involved for some 25 years – initially with the Marine and Coastal Nature Conservation Division and now with the new Marine Nature Conservation Directorate. These milestones also reflect how the marine nature conservation policy area has evolved and expanded.

Table 1: Milestones in marine nature conservation since 1992 (based on Daten zur Natur, 2012)

Year	Milestone	Notes
1992	United Nations Conference on Environment and Development (UNCED), Rio de Janeiro, Brazil	Adoption of an environmental policy action plan for the 21st century (Agenda 21), including Chapter 17 on the protection of the oceans and coastal waters and the protection and ecologically sustainable use of their living resources. Signing of the Convention on Biological Diversity (CBD) – one of the three Rio Conventions – with considerable impact on subsequent agreements relating to biodiversity conservation.
1992	Adoption of the New Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area (entered into force 17 January 2000)	The new Article 15 on Nature Conservation and Biodiversity created objectives for the conservation of species and habitats in the marine and coastal areas of the entire Baltic Sea.
1992	Entry into force of the EU Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora)	The Habitats Directive requires Member States to establish the Natura 2000 European protected area network both in terrestrial and marine areas and lists the marine habitat types and species to be protected.
1998	Addition of Annex V to the Oslo-Paris (OSPAR) Convention for the Protection of the Marine Environment of the North-East Atlantic	The new Annex V on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area extends the Convention to include marine nature conservation.
2002	Major revision of the Federal Nature Conservation Act (BNatSChG)	Establishment and protection of the Natura 2000 European ecological network extended to the Exclusive Economic Zone (EEZ) under the new Article 38 of the Act; BfN assigned the responsibilities (with a very small number of exceptions[1]) of competent authority for the protected areas.

[1] The responsibilities not assigned to BfN were site designation (BMU) and the performance of Habitats Directive assessments (approval authorities).

Year	Milestone	Notes
2002	World Summit on Sustainable Development (WSSD), Johannesburg, South Africa	Chapter IV of the Plan of Implementation contains detailed calls for action for the protection of natural resources, including in coastal waters and marine areas; goals include the establishment of representative global networks of marine protected areas by 2012.
2003	First Joint Ministerial Meeting (JMM) of the HELCOM and OSPAR Commissions and first joint ministerial declaration, Bremen, Germany	Joint HELCOM/OSPAR Work Programme on Marine Protected Areas for the establishment of an ecologically coherent network of marine protected areas in the North-East Atlantic (MPAs) and the Baltic Sea (BSPAs) by 2010 and for implementation of the ecosystem approach for the regulation of human activities at sea.
2004	Nomination of Natura 2000 sites in the German EEZ	On 25 May 2004 Germany nominated ten Natura 2000 sites in the German North Sea and Baltic Sea EEZ (covering approximately 30% of the area of the EEZ) to the European Commission.
2005	Designation of two EU Special Protected Areas (SPAs) under the Birds Directive as the first nature conservation areas in the German EEZ	Ordinances of 15 September 2005 designating the Pomeranian Bay Nature Conservation Area and the Eastern German Bight Nature Conservation Area published in the Federal Law Gazette *(Bundesgesetzblatt Jahrgang 2005 Teil I Nr. 59)*.
2006	First meeting of the UN Biodiversity Beyond National Jurisdiction (BBNJ) Working Group	Launch of the informal process to close implementation gaps in UNCLOS with regard to the conservation and sustainable use of biodiversity beyond national jurisdiction (BBNJ).
2007/ 2008	Germany's ten marine Natura 2000 sites added by the European Commission to the list of Sites of Community Importance (SCIs) and published in the EU Official Journal in 2008	The European Commission added the ten Natura 2000 sites in the German EEZ to the list of Sites of Community Importance (SCIs) in November 2007. The list of sites became effective under EU law on publication in January 2008.
2008	Entry into force of the EU Marine Strategy Framework Directive (MSFD) (Directive 2008/56/EC of 17 June 2008)	The Directive's objective is the attainment of good environmental status in the marine environment by 2020. It very comprehensively addresses the main aspects of marine biodiversity conservation.
2010	Major revision of the Federal Nature Conservation Act (BNatSChG)	All instruments of nature conservation law except landscape planning extended to the EEZ. BfN is the competent authority for marine nature conservation in the EEZ.
2010	HELCOM ministerial meeting in Moscow: Report on implementation of the HELCOM/OSPAR Joint Work Programme (JWP) on Marine Protected Areas	Under German (BfN) leadership, the 159 BSPAs (Baltic Sea Protected Areas) at this point covered more than 10% of the marine area of the Baltic Sea, making it the first marine region to attain the CBD and WSSD target of protecting at least 10% of all world marine ecological regions by 2012.

Year	Milestone	Notes
2010	OSPAR ministerial meeting in Bergen, Norway: Report on implementation of the HELCOM/OSPAR Joint Work Programme (JWP) on Marine Protected Areas	Under German (BfN) leadership, the contracting parties at this time have designated 159 OSPAR marine protected areas, corresponding to 1% of the OSPAR marine area (approximately 147,300 km²). Six large protected areas were additionally adopted at the ministerial meeting, comprising the world's first MPA network in areas beyond national jurisdiction (ABNJs). As of the end of 2010, there were consequently 165 OSPAR MPAs covering an area of 427,300 km² (3.1% of the OSPAR marine area).
2010	10th Conference of the Parties to the Convention on Biological Diversity (CBD COP 10), Nagoya, Japan	The CBD Strategic Plan for Biodiversity 2011-2020 adopted at the conference lays down various targets including: Target 6 (in shortened form): All fish stocks etc. to be managed sustainably by 2020; Target 11: By 2020, at least 10% of mari-ne and coastal areas to be effectively conserved with well-connected MPAs and other measures.
2011	Marine Strategy Framework Directive transposed into national law	Insertion of a new part of the Federal Water Act (WHG) on the management of marine waters; amendment of the Federal Nature Conservation Act (BNatSchG), notably with regard to monitoring.
2014	Entry into force of the Basic Regulation on the reformed EU Common Fisheries Policy (CFP)	Important new objectives from a nature conservation perspective include the stipulations on sustainable management of fish stocks based on maximum sustainable yield (MSY) and substantial reductions in bycatch.
2014	CBD COP 12 in Pyeongchang (South Korea)	An outcome was the listing of 204 Ecologically or Biologically Significant Marine Areas (EBSAs). While EBSAs are not MPAs, this was a further important step towards a global network of marine protected areas, supported by work of the BfN-funded Global Ocean Biodiversity Initiative (GOBI).
2015	UN resolution on development of a legally binding instrument under the United Nations Convention on the Law of the Sea (A/Res/69/292)	The United Nations General Assembly adopted a resolution in 2015 on the development of a legally binding instrument under UNCLOS on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction.
2017	Designation of the Habitats Directive and Birds Directive sites as six nature conservation areas in the German EEZ	Ordinances designating the nature conservation areas Dogger Bank, Borkum Reef Ground, Sylt Outer Reef – Eastern German Bight, Fehmarn Belt, Kadet Trench and Pomeranian Bay – Rønne Bank, published in the Federal Law Gazette, Bundesgesetzblatt Teil 1, Nr. 63, 27 September 2017.

5 Marine Nature Conservation Directorate responsibilities and work areas

BfN's marine nature conservation responsibilities in overview

BfN's Marine Nature Conservation Directorate (Directorate II 5), supported by Divisions II 4.3 (Nature Conservation and Renewable Energy), II 4.2 (Impact Mitigation and Transport Infrastructure Planning) and I 2.1 (Legal Affairs, Economics and Ecologically Sound Regional Development), has a range of responsibilities encompassing international, European and national work areas. These include the establishment and protection of the European Natura 2000 protected area network in Germany, the selection and designation of suitable sites for marine protected areas, and the development of requirements and objectives for their management. Together with other BfN organisational units, Directorate II 5 is also responsible for granting, supervising and monitoring exceptions and exemptions from prohibitions in Natura 2000 protected areas and for preparing and implementing management plans for these areas. BfN additionally ensures the prevention and restoration of damage to species and natural habitats pursuant to the Environmental Damage Act (USchadG) and grants exceptions from prohibitions on taking from the wild under species conservation law. It is also concerned with requirements for sustainable exploitation of the seas, such as marine sand and gravel extraction, offshore wind energy generation and marine fisheries. A current focus in the latter area is on the development of requirements for ecosystem-friendly fisheries and related fisheries management in protected areas. BfN must also be involved in various administrative procedures under other Federal or Länder agencies, such as in approval procedures for the construction and operation of various kinds of installations at sea such as wind turbines, marine sand and gravel extraction, and hydrocarbon prospecting and extraction. This involves work such as compiling specialist and legal opinions.

In connection with national implementation of the Antarctic Environmental Protocol, BfN must be involved in the approval of, for example, research activities by German research institutes and is the competent national enforcement authority under the Convention for the Conservation of Antarctic Seals.

BfN represents the Federal Government on a large scale in numerous international bodies concerned with marine conservation and is thus extensively involved in the implementation of European and international guidelines, directives and strategies relating to the seas. Furthermore, the Marine Nature Conservation Directorate carries out and/or supervises a wide variety of research projects, many of them relating to European or international marine protected areas and the EEZ, to prevention or mitigation of anthropogenic pressures, to ecosystem-friendly fisheries and to species conservation, including the conservation of marine species such as the sturgeon or the European flat oyster.

Marine Nature Conservation Directorate (II 5)

In the following, the main work areas of the Marine Nature Conservation Directorate (II 5), division by division, are set out in greater detail. Current work focuses are described first followed by an outline of future activity areas.

Division II 5.1: General Tasks and International Marine Nature Conservation

The general responsibilities of Division II 5.1 include coordinating research and budget funding for the entire Directorate. Specifically, this comprises:

- Compiling draft budgets, including personnel and infrastructure development;

- Project development and specialist/administrative support for BfN-awarded projects and work packages in the field of national and international marine nature conservation;
- Project management and coordination for awarded projects (specialist supervision of awarded projects is spread across all three Divisions);
- Scientific appraisal of interim results and final results of awarded projects;
- Organisation and chairing status seminars and workshops, as well as larger conferences such as the international conference on Progress in Marine Conservation (in Europe) (PMC / PMCE);
- Compiling internal reports and coordinating publications (see below).

BfN initiates and funds large numbers of research projects in marine nature conservation. The projects are carried out with funding allocated out of a range of budget headings. The majority are funded from the EEZ budget heading. There are also large numbers of research and development (R&D) projects that are realised under the Environmental Research Plan (UFOPLAN). Testing and development projects and BfN-funded projects carried out by nature conservation organisations also relate to marine nature conservation. The project partners, funding recipients and contractors include not only university institutes and large research institutions, but also private research consultants and nature conservation associations. The Marine Nature Conservation Directorate regularly supervises about 30 projects, making for a constant high workload in this work area. As the central federal scientific authority for national and international nature conservation, BfN will maintain its high level of involvement in marine nature conservation research into the future, thus providing essential input for decision making and appraisal as well as for implementation approaches and measures.

Fig. 3: left: BfN research diver (photo Hübner, Krause/BfN)
right: Baltic Sea seabird monitoring (photo Kaufner/BfN)

The general responsibilities of Division II 5.1 also include organising patrols to the Natura 2000 protected areas and for species and habitat monitoring. Key work areas in this connection include underwater equipment, research diving and the production, collection and archiving of image and video data. Specifically, this includes:

- Patrols to the North Sea and Baltic Sea EEZ (in collaboration with/as support for II 5.2 – see Fig. 3): Sidescan sonar mapping in selected areas and analysis of the resulting imagery; underwater filming with towed cameras (HD quality) and ROVs; diving in previously surveyed areas (see Fig. 3); sampling and photography in selected areas; grab sample collection, analysis and cataloguing;

- Archiving of research outcomes: Archive upkeep; archiving of photographic and film material from the EEZ;
- Provision and care of equipment such as underwater cameras, sidescan sonars, diving equipment and vessels.

Division II 5.1 also provides specialist input for the Marine Nature Conservation Directorate on marine nature conservation topics for press and public relations work (Press and Public Relations Section in Bonn). Commencing several years ago, in a succession of projects on communication and on the basis of a strategy in place since 2007, the Directorate also publishes media products such as brochures, roll-up displays, flyers and films, notably on the Natura 2000 marine protected areas and various research activities. It is planned for Division II 5.1 to continue performing this communication work and providing the Press and Public Relations Section with specialist support in this way. This is very important with a view to informing the public and a range of user groups about the new protected area ordinances and any management measures for the marine protected areas in the EEZ.

All divisions within the Marine Nature Conservation Directorate regularly publish scientific articles in the BfN publication series such as *Natur & Landschaft (NuL)*, *BfN-Skripten* and *Naturschutz und Biologische Vielfalt (NaBiV)*. Staff of the Directorate also contribute to non-BfN publications and produce scientific articles for this purpose (von Nordheim (2017 *in press*); BSH & BMU (2014); Marine Ecology Progress Series; Baltic Sea Environment Proceedings (various years); ICES Journal of Marine Science). Division II 5.1 maintains a list of scientific publications that is also available for viewing and downloading on the BfN website. Directorate staff also regularly give scientific presentations at conferences, seminars and workshops. Many of these are published as PDFs on the BfN website or the websites of the institutions organising the events concerned.

In international marine nature conservation, requirements and responsibilities are addressed that primarily arise under the regional Helsinki and OSPAR Conventions and under global conventions such as UNCLOS and the CBD. Division II 5.1 is party to a very large number of international processes in this regard and the many years of experience, involvement and scientific expertise of the Marine Nature Conservation Directorate in this thematic area have enabled BfN to build an outstanding reputation.
For example, Germany – represented by BfN – has led HELCOM biodiversity activities for a long time and has chaired the OSPAR Intersessional Correspondence Group on Marine Protected Areas (ICG-MPA) for many years. In 2009, the launch of the Global Ocean Biodiversity Initiative (GOBI) for the establishment of a global network of marine protected areas is also attributable to BfN, and Division II 5.1 continues its involvement in this connection.

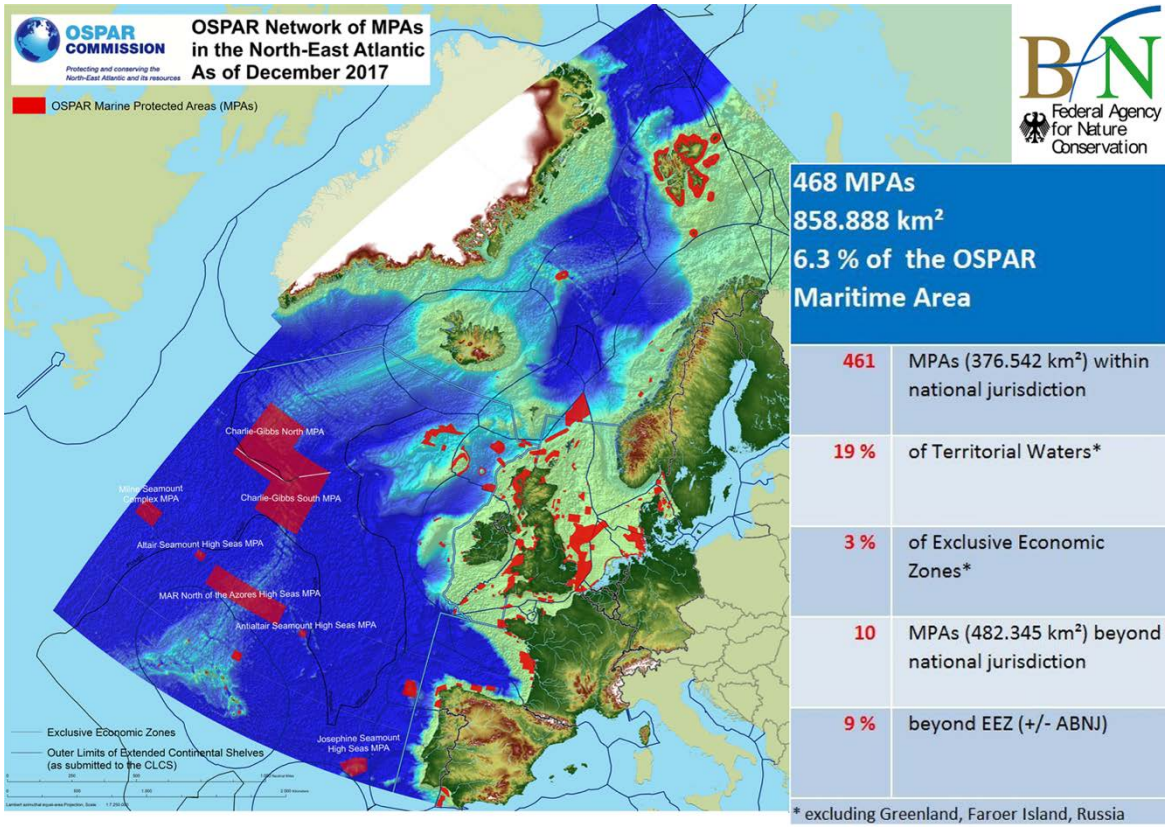

Fig. 4: Network of OSPAR marine protected areas for valuable underwater habitats and threatened and declining OSPAR species and habitats. Division II 5.1 chairs the OSPAR MPA group (map: BfN II 5)

Current work focuses can be outlined as follows:

- Support for the UN negotiation process for a legally binding instrument under the United Nations Convention on the Law of the Sea (UNCLOS) on the conservation and sustainable use of biodiversity in areas beyond national jurisdiction. The subject of the current negotiation process is the agreed content of what is referred to as the package deal: Marine genetic resources (MGRs); marine protected areas, including area-based management tools, environmental impact assessments, capacity building and technology transfer;
- Designation of additional marine protected areas (MPAs) and effective management of MPAs in the North-East Atlantic (OSPAR waters), notably in areas beyond national jurisdiction (ABNJs); completion of an ecologically coherent MPA network (see Fig. 4);
- Identification of ecologically or biologically significant marine areas (EBSAs – see Fig. 5) and their management via enhancement of the CBD-EBSA process; supporting GOBI;
- Completion of an ecologically coherent network of effectively protected HELCOM Baltic Sea Protected Areas (HELCOM MPAs – see Fig. 6). This includes the compilation of management plans for the German HELCOM MPAs in the EEZ, which are identical to the Natura 2000 sites, in order to implement the applicable HELCOM Recommendation 35/1 and meet obligations under European law;
- Comprehensive assessment of biodiversity in the Baltic Sea marine area for the HELCOM HOLAS II project;
- Development of conservation measures for OSPAR and/or HELCOM-listed threatened or declining species and habitats.

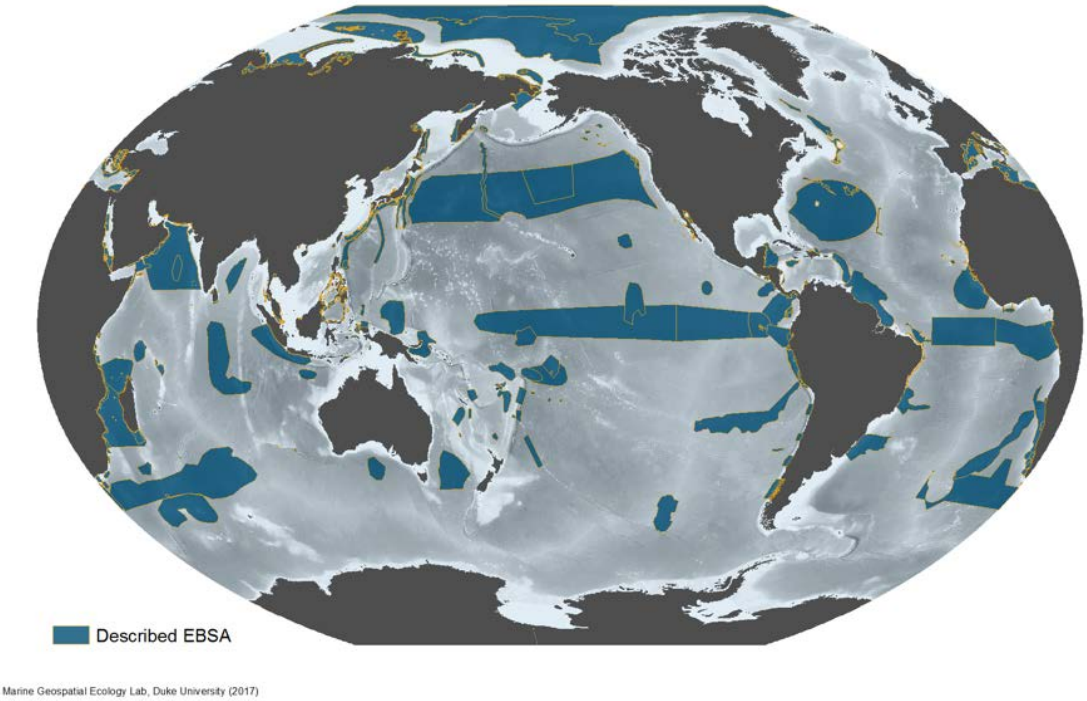

Fig. 5: Map of ecologically or biologically significant marine areas (EBSAs) of the world's oceans, 2017. Marine Geospatial Ecology Lab, Duke University (2017)

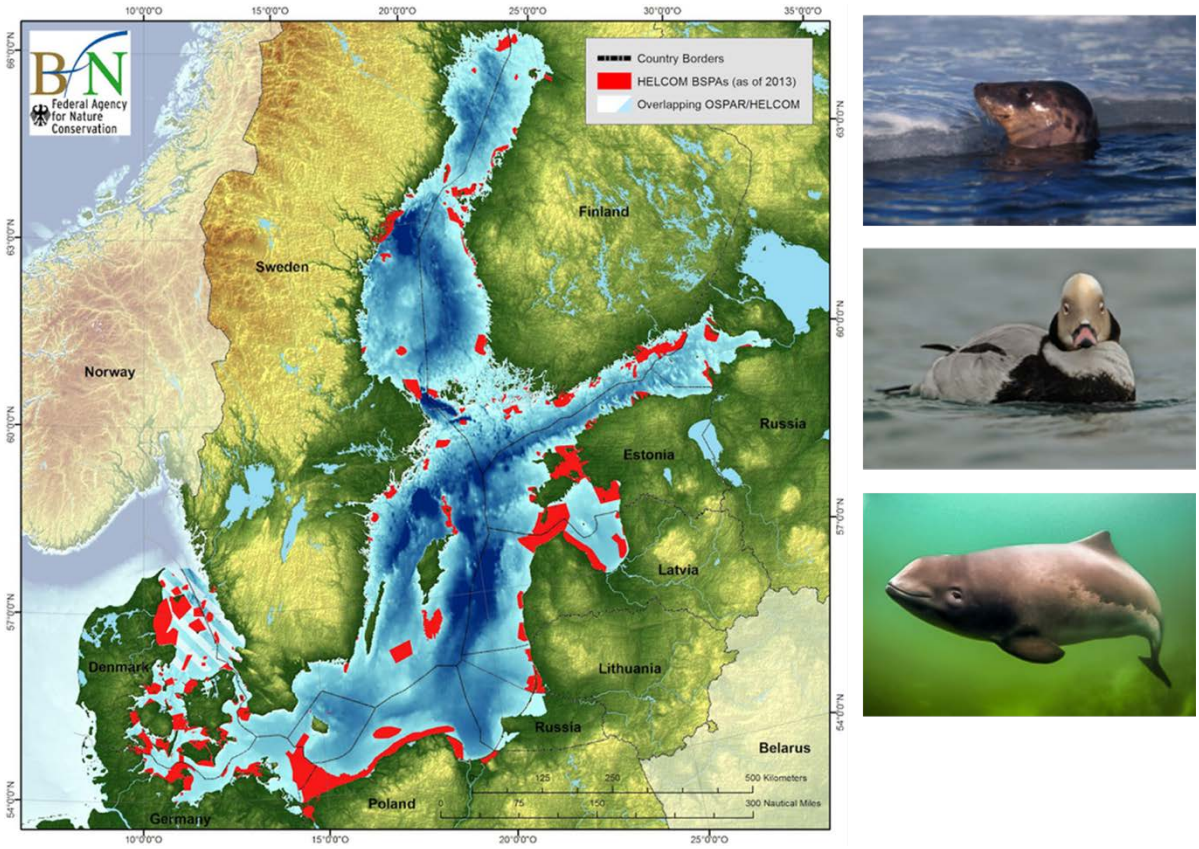

Fig. 6: HELCOM MPA network, 2015 (map BfN, data source HELCOM MPA data base; photos: grey seal Sven-Erik Arndt; long-tailed duck Stefan Pfützke; harbour porpoise Peter Verhoog/Juniors Wildlife)

The Division's intensive activities around the identification, designation and establishment of marine protected areas under regional marine conservation agreements and the CBD will also continue in the future.

The work of Division II 5.1 will correspondingly focus on the following areas in coming years:

- Identification and designation of MPAs in areas beyond national jurisdiction (ABNJs) in the North-East Atlantic;
- Development and implementation of effective management measures in MPAs in ABNJs in the OSPAR Convention area;
- Designation of MPAs in ABNJs worldwide, with special consideration of polar areas;
- Development of assessment criteria for "effectively" managed and ecologically coherent protected areas and protected area networks;
- Work on biodiversity conservation in the Arctic in conjunction with all relevant bodies with responsibility for the Arctic (Arctic Council; Protection of the Arctic Marine Environment (PAME) Working Group; Conservation of Arctic Flora and Fauna (CAFF));
- Selection of existing EBSAs for the development of future MPAs;
- Participation in the UNCLOS Preparatory Committee (PrepCOM), which is tasked from 2016 with compiling substantive recommendations on elements of a draft instrument and is to report to the UN General Assembly by the end of 2017;
- Intensification of activities for the development and implementation of management plans and measures for the HELCOM MPAs in order to make greater progress in future implementation of the Baltic Sea Action Plan;
- Cooperation with international fisheries organisations, the International Seabed Authority (ISA) and the Intergovernmental Oceanographic Commission (IOC).

Division II 5.1 supervises several large research projects for the North Sea and Baltic Sea tasked with surveying and cataloguing habitats and habitat type classification. For example, a register is to be compiled of habitats protected under Article 30 of the Federal Nature Conservation Act (BNatSchG) in the German North Sea and Baltic Sea EEZ. This is based on a collaborative effort with the Federal Maritime and Hydrographic Agency (BSH) to map sediments throughout the German North Sea and Baltic Sea EEZ. Workshops such as on marine biodiversity mapping issues are held at the International Nature Conservation Academy (INA) on the Isle of Vilm.

A current focus in the area of marine biodiversity conservation strategies and measures is an implementation plan for OSPAR recommendations for threatened or declining species and habitats. BfN has already contributed substantially in this area for OSPAR and HELCOM in the past, for example with regard to the compilation of lists of threatened species and habitats and of HELCOM Red Lists (see, e.g., Boedeker & Zweifel 2016). This involvement is to be continued.

Future work focuses for Division II 5.1 in this area will consequently include:

- Implementation of OSPAR recommendations for threatened or declining species and habitats in German marine areas and national waters of OSPAR Contracting Parties and OSPAR ABNJs;
- Supplementing the OSPAR list of threatened or declining species and habitats to include additional species and habitats and intensive involvement in the OSPAR Intersessional

Correspondence Group on the implementation and follow up of measures for the protection and conservation of species and habitats (ICG-POSH), which is currently co-chaired by Germany;

- Development of conservation programmes and management measures for species and habitats on the HELCOM Red Lists;
- Optimising the monitoring of biodiversity-related parameters within HELCOM;
- Involvement in the HELCOM State & Conservation, SEAL and FISH groups.

Division II 5.1 also provides scientific support for various species/habitat conservation projects. These include the highly successful project for the breeding and reintroduction of the European and Baltic sturgeon (see https://www.bfn.de/themen/meeresnaturschutz/marine-arten/artenschutzprojekte/stoer.html). Current work and research focuses, including with international cooperation, relate to the grey seal (*Halichoerus grypus* – see Fig. 7 left) in the Baltic Sea (see also https://www.bfn.de/themen/meeresnaturschutz/marine-arten/artenschutzprojekte/rueckkehr-kegelrobben.html) and notably to the European flat oyster (*Ostrea edulis,* see Fig. 7 right).

Fig. 7: left Grey seal (*Halichoerus grypus*) (photo Katrin Wollny-Goerke)
right: European flat oyster (*Ostrea edulis*) (photo Katrin Wollny-Goerke)

The conservation projects for these two species will continue to be of major importance, partly by virtue of their symbolic nature. The grey seal is a prime example of the natural spread of a large animal species that was formerly heavily decimated by human eradication activities and is now gradually also becoming established again in the German Baltic Sea. It could become an example of appropriate management of the coexistence of large marine predators and humans (fishing operators and tourists); in this it resembles the wolf. The European flat oyster is practically extinct in the North Sea. Now, through an extensive reintroduction programme, there is good chance for it to return to its original habitats over the long term and in some areas regain its important erstwhile role as a habitat former. Specialist support and coordination of these projects will remain an important task of Division II 5.1 in the future.

A very extensive work area in Division II 5.1 is the integration of marine nature conservation into offshore fishing. This includes all national and European aspects of issues surrounding fisheries. In recent years, Division II 5.1 has concerned itself in particular with the ecosystem effects of sea fishing such as the impacts of set nets and bottom trawling on species and habitats in German marine waters; it has also addressed mariculture. Great effort is made here to identify individual problem areas between nature conservation and fishing and to find solutions, including in collaboration with the International Council for the Exploration of the Sea (ICES) and with German fisheries research institutes and nature conservation associations. This is reflected in numerous publications and position papers (see, for example,

https://www.bfn.de/themen/meeresnaturschutz/downloads/berichte-und-positionspapiere.html). Division II 5.1 has notably contributed scientific expertise and served as the driving force in the development of and the currently still ongoing, highly involved consultation process on fisheries management measures for protected areas in the German North Sea and Baltic Sea EEZ.

Current major work focuses are as follows:

- Ongoing development and implementation of fisheries management measures for attainment of the conservation objectives for Natura 2000 sites in the German North Sea and Baltic Sea EEZ under the Common Fisheries Policy (CFP);
- Compilation of specialist opinions on the effects of commercial and recreational fishing on marine ecosystems, fish stocks, protected species and habitats;
- Developing and promoting the use of ecosystem-friendly fishing gear, in particular to reduce bycatch of seabirds and harbour porpoises and of non-target species in set nets;
- Compilation of nature conservation position papers on current European fisheries policy with regard to biodiversity conservation;
- Promoting the ecological certification of commercial fisheries and their products and further developing the ecological standards and criteria for marine eco-labels.

This work must continue in the years ahead, especially considering that the consultation processes for fisheries management measures in Natura 2000 protected areas are extremely complex and protracted as measures first have to be agreed at national level and then approved at EU level. Considerable need for action remains here in the next few years for the German Baltic Sea protected areas in particular, in connection with a highly complex fisheries research project together with the Thünen Institute (Baltic Sea), in order to steer effective management measures through the various decision-making bodies and obtain approval from the European Commission.

Further future responsibilities then follow after adoption of the fisheries management measures:

- Development of conceptual frameworks and activities for supervising and monitoring the fisheries management measures with regard to commercial and recreational fishing in marine Natura 2000 protected areas;
- Analysis of the effectiveness (monitoring) of fisheries management measures in the attainment of conservation objectives – e.g. the effects of closed fishing areas on species and habitats in the vicinity of Dogger Bank, Amrum Bank, Borkum Reef Ground and various Baltic Sea protected areas;
- Development of fisheries management measures under the MSFD, including criteria and indicator development.

Division II 5.2: Marine Protected Areas, Management and Monitoring

Administration, management and monitoring of German marine protected areas in the EEZ are important enforcement tasks for BfN, responsibility for which lies with Division II 5.2. These responsibilities are performed in close consultation with other divisions within the Directorate and in BfN.

Over 15 years ago, after extensive research work, BfN identified ten Natura 2000 protected areas in the German North Sea and Baltic Sea EEZ (von Nordheim et al. 2006). After notification to the EU in 2004, the two special protected areas (SPAs) Eastern German Bight and

Pomeranian Bay were designated as nature conservation areas by ministerial ordinance in 2005 (Verordnungen über die Festsetzungen der Naturschutzgebiete 2005, Garthe et al. 2012). The eight special areas of conservation gained EU recognition as sites of Community Importance (SCIs) at the end of 2007 and became effective under EU law in January 2008 – a major success for German marine nature conservation and BfN (Krause et al. 2011). All ten protected areas were placed under national statutory protection by means of six protected area ordinances in September 2017. They include the nature conservation areas already designated for implementation of the Birds Directive. The two previous nature conservation area ordinances were superseded by the new ordinances (see Fig. 8).

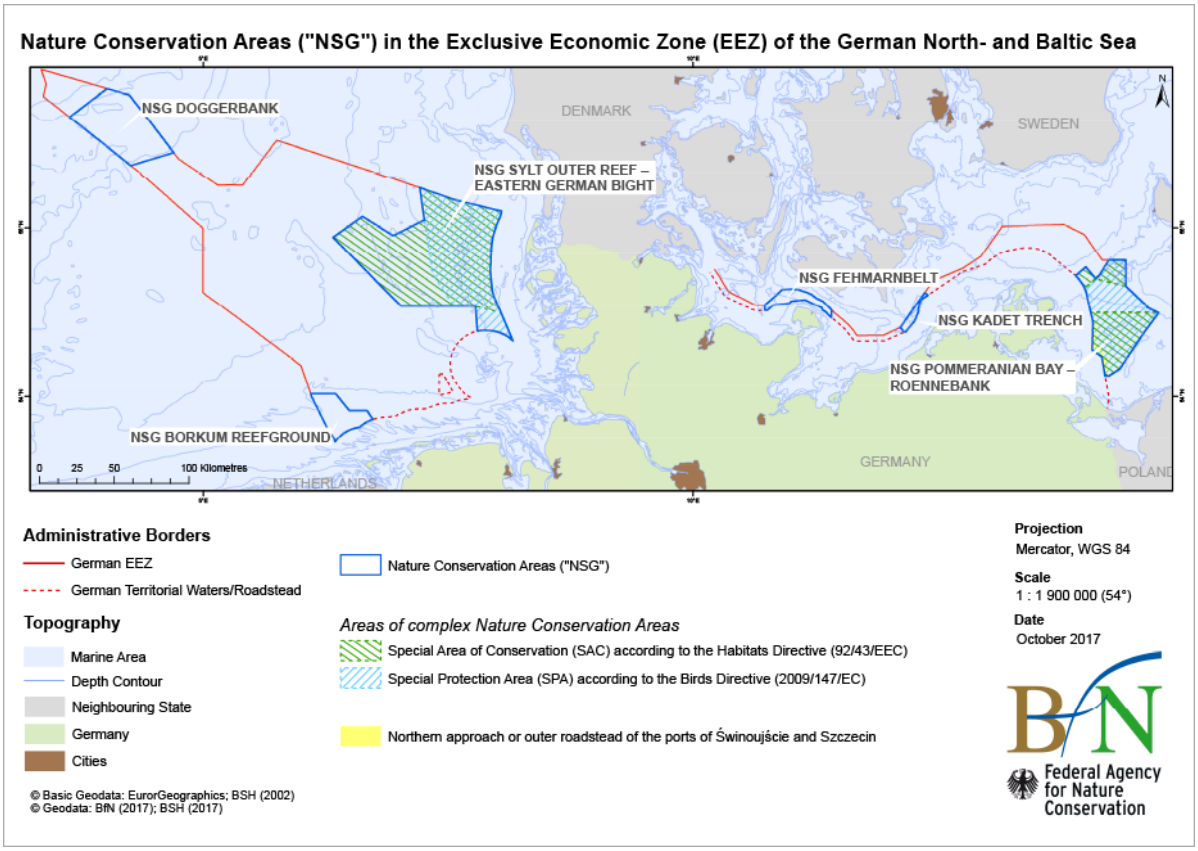

Fig. 8: The 10 Natura 2000 sites in the German North Sea and Baltic Sea EEZ were transformed into six nature conservation areas at the end of September 2017

The main focuses in the work of Division II 5.2 in this area are as follows:

- Development of the substantive basis and compilation of first drafts of management plans for the protected areas;
- Derivation of management measures;
- Harmonisation and coordination of related work processes with neighbouring states and the European Commission (among other things in the Commission's Marine Expert Group).

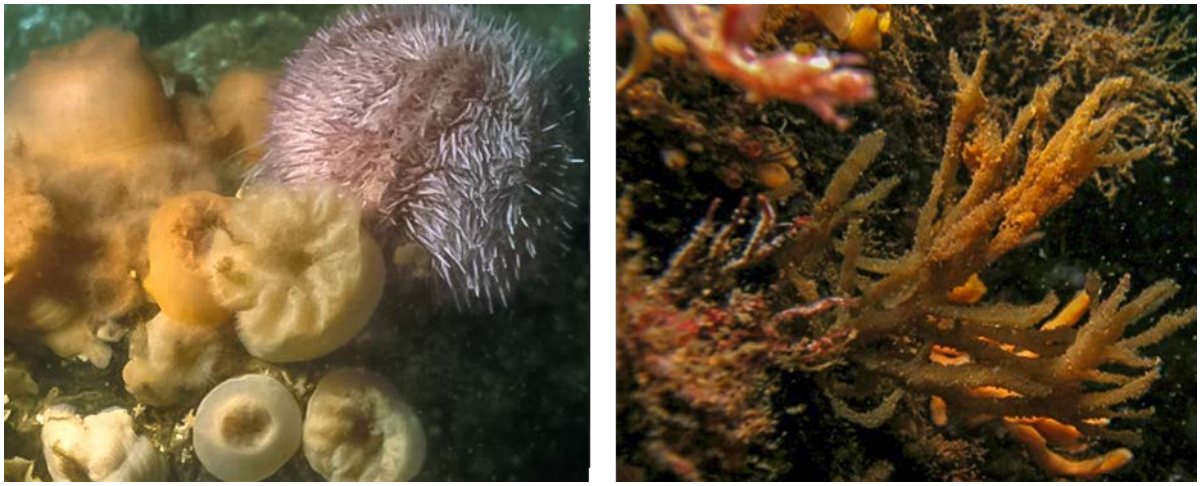

Fig. 9: left Sylt Outer Reef SAC (photo: BfN/Hübner, Krause), right: Fehmarn Belt SAC (photo: BfN/Hübner, Krause)

With ordinances now enacted for all of the protected areas, these responsibilities will now further evolve and in future will mainly comprise the following:

- National coordination of management plans and their implementation;
- Monitoring of human activities and use of the sea inside and outside of the protected areas;
- Development and supervision of compensation and mitigation measures;
- Monitoring of the status and biodiversity of the German North Sea and Baltic Sea, in particular as an outcome of implementing management measures;
- Management of data, personnel and funds; approvals;
- Communication of work products to competent national and international authorities, and dialogue with the public on developments in the protected areas.

The success of management measures must be continuously monitored and the measures adapted as necessary for the best possible protection of species and habitats while having due regard to user interests. This is the first time that the Federal Government has the responsibility of performing the administration of marine protected areas. BfN and most of all the Marine Nature Conservation Directorate thus face a huge challenge. The objective is a sufficiently large-scale protected area network and effective management that, together with a fully functioning protected area administration and sufficient monitoring, ensure that the protected marine species and habitats in the German North Sea and Baltic Sea EEZ are able to prosper (see Fig. 9). This can also contribute significantly towards improving the status of marine biodiversity in neighbouring waters.

In the context of Natura 2000, Division II 5.2 also addresses marine aspects of the Habitats Directive and Birds Directive at EU level.

Current work focuses at EU level comprise:

- Supporting neighbouring states and the European Commission in concluding the process of designating marine protected areas in all European marine waters, with the focus on the North-East Atlantic and the Baltic Sea;
- Development of management objectives for the Natura 2000 network;
- Coordinating the management objectives with the coastal Länder and neighbouring states;
- Ensuring harmonised implementation of Natura 2000 and the MSFD with a view to developing a European network of ecologically coherent marine protected areas.

Progress so far in jointly establishing a European marine protected area network has been regrettably slow. Germany's leading role is therefore to be maintained in the future by means of BfN's sustained involvement in this field.

The EU Marine Strategy Framework Directive (MSFD) of 2008 creates a regulatory framework for action by all EU member states to achieve or maintain good environmental status in all European seas by 2020. The term "marine environment" as used in the MSFD explicitly includes protecting marine species and habitats together with the marine ecosystem as a whole and thus to a large extent also encompasses aspects of marine biodiversity conservation. BfN is therefore also charged with international and national implementation of the MSFD and in particular with biodiversity aspects. Directive II 5.2 currently serves as the secretariat for national implementation of the MSFD.

A shared understanding on how the MSFD is to be efficiently implemented is emerging slowly at EU level after many negotiations. With the current and not very effective action, it is already becoming apparent that the original target date of 2020 for achieving good environmental status will have to be put back significantly. In addition, in most cases the measures required by the MSFD cannot be put into effect using the legal instruments provided by it, and instead other possibilities (including legislative means) have to be exploited in order to implement them.

The current work focuses of Division II 5.2 in this area comprise:

- Development of scientifically well-founded indicator-based methodologies, including scales and threshold values for assessing the condition of the seas ("good environmental status" as defined in the MSFD);
- Quantification of operational environmental targets in the national report on Article 10 (2018) for the German North Sea and Baltic Sea;
- Development of technical concepts for a variety of measures;
- Preparatory work for compilation of regular reports required on Article 8-10 of the MSFD (status of the marine environment, good environmental status and environmental targets for the marine environment).

Future work focuses follow on from the above:

- Indicator-based development of methodologies for assessing the status of the marine environment;
- Development of methodologies to determine exposure thresholds;
- Development and implementation of measures for ecosystem-friendly and sustainable use of the marine environment for the attainment of good environmental status as defined in the MSFD;

- Quantification of environmental targets for Article 10 for the German North Sea and Baltic Sea;
- Adaptation of monitoring and data management.

Good marine monitoring can quickly and reliably detect negative trends in marine biodiversity and trigger appropriate management measures (see Fig. 10). Monitoring data can often be used to show how specific human activities have specific impacts on marine biodiversity. The success of conservation measures and programmes promoting ecosystem-friendly sustainable use of the seas is also assessed using indicators that measure the status of the marine environment by criteria such as biodiversity, non-native species, fish stocks and pollution levels (as with the indicators under the MSFD and the ecological quality objectives (EcoQOs) developed under OSPAR. Supervising and coordinating the extensive marine nature conservation monitoring activities in the German marine Exclusive Economic Zone is consequently one of the scientific pillars supporting all national activities by BfN in the North Sea and Baltic Sea and is thus a fundamental part of BfN's work. BfN additionally coordinates other significant parts of the marine monitoring for implementation of the MSFD in collaboration with the coastal Länder in the Federal/Länder Committee on the North Sea and Baltic Sea (BLANO).

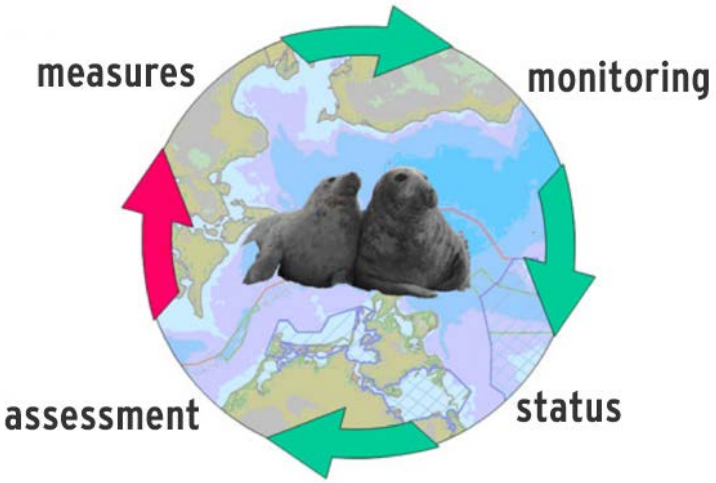

Fig. 10: Monitoring as a key element of status assessment and success measurement

Division II 5.2 has the following focus areas in biodiversity monitoring:

- Vertebrate monitoring: This is planned and carried out as an official task of BfN by contracting out to or in collaboration with various scientific research institutions in order to meet reporting requirements under the Habitats Directive, Birds Directive and MSFD. A number of methodologies are currently in need of revision due to added responsibilities and changes in the use of the seas. This notably includes switching over to digital methods in flight surveys, as the construction of offshore wind turbines has resulted in marine areas being closed to shipping and prevents low-altitude flying. This means it is no longer possible in some areas to carry out the waterborne or airborne surveys with human observers that were the usual method in the past.
- Benthos monitoring: Monitoring of the sea floor and of marine habitats is partly done to meet Habitats Directive reporting requirements. It involves surveying and assessing the fauna and flora communities found on soft and hard substrates. Modifications are needed in order to meet the indicator-based assessment requirements under the MSFD and regional marine agreements.

An additional aim is to further improve the provision of the public and the EU with BfN marine monitoring data using Internet-based data exchange. In consultation with Division Z 2.1 (Nature Conservation Information and Geographic Information), Division II 5.2 is working on the development of digital infrastructure for the effective organisation and (partial) automation of these data flows. The foundations have been laid for closer collaboration in data availability with other agencies (the Federal Maritime and Hydrographic Agency (BSH), the Thühen Institute (TI) and Länder agencies) and in part already implemented in cooperation – with scope for improvement – with MDI-DE (Marine Data Infrastructure Deutschland).

In this connection, the following work areas require rapid future action:

- Preparing and making available monitoring data and setting up and processing corresponding databases and online tools;
- Incorporating data from other institutions (primarily BSH) into BfN analyses (there are shortcomings in cooperation between these institutions or in some cases inter-institutional agreements are needed);
- Promoting collaboration and exploiting synergies between research projects, including effective data and information availability;
- Award of research projects to modernise the data infrastructure for marine biodiversity data;
- Increased involvement of Division staff or external project staff in relevant national and international groups.

Division II 5.2's responsibilities also include the area of invasive marine species, which is addressed in consultation with Division II 1.1.
This work area currently includes financing and providing specialist support for an annual monitoring programme in selected North Sea and Baltic Sea ports. Assessment of the survey data is performed using a trend indicator that tracks the introduction rate of non-indigenous species (among other things for the neobiota descriptor under the MSFD). The work is carried out in close collaboration with the coastal Länder and the BSH under the framework of the Federal/Länder Committee on the North Sea and Baltic Sea (BLANO).

The purpose of tracking the trend in introductions of non-indigenous species is to determine whether measures to minimise introductions are having an effect. The objective is to attain the national MSFD environmental target, which is for the total number of introductions of new species to tend towards zero.

In the future, the existing invasive species monitoring programme is to be continued and further developed in line with additional national and international requirements by:

- Establishing an invasive species platform for better national and in future international exchange at expert level;
- Additionally establishing a trend indicator at international level.

Under the Trilateral Waden Sea Cooperation (TWC) between the Netherlands, Germany and Denmark, Division II 5.2 is involved in trilateral Wadden Sea management. It supports the Task Group on Management and Monitoring, whose main task is to coordinate Wadden Sea management and monitoring matters with the aims and activities involved in cooperating with marine neighbours under OSPAR, such as with regard to the use of monitoring data.

Division II 5.2 performs data management and cartography for marine geodata within the Marine Nature Conservation Directorate for presentation purposes, to answer general marine questions and to meet the marine part of Natura 2000 reporting requirements.

Division II 5.3: Human Impacts and Ecological Issues in Marine Activities

Human activities have an impact on marine habitats and ecological communities to varying degrees (see Table 2). With increasing mechanisation in recent decades and a growing scope for offshore operations, the pressures on the marine environment due to human use continue to increase. The high intensity and the nature of exploitation now pose severe threats to biodiversity in the North Sea and Baltic Sea and in many other marine regions (von Nordheim, H. & G. Hempel, 2017).

Table 2: Selected examples of anthropogenic influences in the North Sea and Baltic Sea

Einflussfaktoren in Nord- und Ostsee		**mögliche negative Auswirkungen**
(1)	Marine sand and gravel extraction	Harm to the sea floor, bottom-dwelling flora and fauna (benthos) and food sources for marine animals and birds
(2)	Wind turbines	Underwater noise in construction and operation, sea-bird habitat loss, bird strikes
(3)	Oil/gas rigs	Underwater noise in construction and operation, accidental gas leaks and oil spills
(4)	Electrical cables and pipelines	Electromagnetic fields, harm to the sea floor and its ecological communities
(5)	Drilling	Underwater noise, harm to the sea floor
(6)	Seismic surveys	Underwater noise
(7)	Channel dredging (shipping lanes)	Harm to the sea floor, disturbance, turbidity plumes

Major work areas of Division II 5.3 include assessing such anthropogenic activities in terms of their impacts on marine species and habitats in temperate and also polar regions, and developing impact mitigation strategies and measures (among other things as part of marine spatial planning balancing all relevant interests).

Division II 5.3 is consequently responsible among other things for the ecological assessment of anthropogenic pressures in the marine environment, including the assessment of harm to marine biodiversity. This also includes species and habitat conservation in planning approval procedures, impact prevention and mitigation and developing and researching alternative, environment-friendly methods and approaches.

Current focuses in this field comprise the following individual areas:

- Involvement in planning approval procedures for projects in the North Sea and Baltic Sea Exclusive Economic Zone. This mainly relates to offshore wind turbines and the cables linking them to the onshore grid, the laying and operation of undersea cables (interconnectors), pipelines, and natural resource exploration and extraction (prospecting for and extracting sand and gravel, gas and oil).
- Contributions to the assessment of ecological impacts of anthropogenic operations, including environmental impact assessment (EIAs and Habitats Directive assessments) and species and habitat conservation, with the focus on protected species (mostly marine mammals, seabirds and migratory birds) and habitats (under Article 30 of the Federal Nature Conservation Act (BNatSchG), the Habitats Directive and the Birds Directive).
- Planning and granting research and development projects for the analysis of individual influencing factors as the basis for assessing ecological impacts and developing prevention and mitigation measures. Division II 5.3 is currently primarily involved in the field of underwater noise, for example with regard to the impact of pile driving noise during the

construction of wind turbine foundations and associated noise control measures (such as bubble curtains and other low-noise construction methods – see Fig. 11), and in investigating the effects of operating wind turbines on bird and bat migration. A further example is research into shipping noise and its impacts on marine species, most of all in EEZ protected areas.

Fig. 11: Bubble curtains minimise underwater noise from pile driving for wind turbine foundations (left: photo Klaus Betke; right: photo Trianel).

The size of these tasks has increased enormously in the last 20 years with the massive growth of renewable electricity generation using large-scale offshore wind farms and further increases in existing uses of the North Sea and Baltic Sea EEZ. At the same time, the last few decades have also brought key successes in the conservation of the marine natural environment, partly in collaboration with other BfN directorates and divisions and/or other federal agencies such as the Federal Environment Ministry (BMU), the Federal Environment Agency (UBA) and the Federal Maritime and Hydrographic Agency (BSH):

- Planned works in the EEZ that require approval (except offshore wind farms) are now subject to impact mitigation rules with the implementation of compensation or substitution measures as applicable (see section 3, Legal framework, and section 4, Marine nature conservation milestones/Major revision of the Federal Nature Conservation Act (BNatSchG) in 2010);
- There is a general obligation to operate with minimum impact on the natural environment and where applicable to apply mitigation measures;
- Sand and gravel extraction in marine protected areas is now more compatible with protected area conservation objectives;
- An exposure limit has been established for underwater noise from pile driving for offshore wind turbines. This is the first legal stipulation of its kind in Europe. The maximum level can currently only be complied with by using comprehensive technical mitigation measures. BfN has provided very substantial funding for research into such mitigation measures and continues to do so (see Fig. 12);
- A strategy for protection from underwater noise in the North Sea has been compiled and has now been applied in the construction of offshore wind turbines for a number of years (see Schallschutzkonzept 2013);
- Where possible, habitats that are protected under Article 30 of the Federal Nature Conservation Act (BNatSchG) are avoided when laying pipelines and cables;

- In the construction and operation of electrical cables, electromagnetic fields are minimised by the use of new cable types recommended by BfN, thus limiting sediment warming to an ecologically acceptable level (2K criterion – see below). The 2K criterion has also been incorporated in corresponding OSPAR guidelines.

Fig. 12: Two BfN publications resulting from extensive research work on noise mitigation and control for offshore wind turbines

The virtually unchecked growth of offshore wind power and the continually increasing pressures on the German EEZ place ongoing high demands on the work of Division II 5.3. An important task with regard to offshore wind farms that have now gone into operation is to compare the prognoses made by BfN with the actual ecological impacts and determine any action to be taken. There are knowledge gaps with further research needed as to the impacts of offshore wind turbines on migratory bird species (both land and seabirds) and bats. Valid analysis and a sound quantification of collision rates, for example, are not yet feasible.

This results in the following work focuses for the years ahead:

- Continued involvement in approval procedures for works planned in the German North Sea and Baltic Sea Exclusive Economic Zone. In particular, following a change in the approval procedure as a result of the Renewable Energy Sources Act (EEG) 2017 and the Offshore Wind Energy Act (WindSeeG), Division II 5.3 (together with Division II 4.3) will be involved in the future in the selection of suitable locations for offshore wind turbines and routes for cables connecting them to the grid;
- Future assessment of the ecological impacts of offshore wind farm-related anthropogenic impacts will primarily involve analysing the outcomes of effect monitoring, in particular for offshore wind farms that have now gone into operation in German marine waters, among other things in connection with impact assessments (EIAs, Habitats Directive assessments and assessments for the purposes of species and habitat conservation).
- With regard to planning, awarding and supervising research projects for the analysis of individual influencing factors as the basis for assessing ecological impacts and developing prevention and mitigation measures, Division II 5.3's primary focus in the future will be on the following:
    - Impacts of offshore wind power on bird migration over marine waters and on populations of resting migratory birds;
    - Impacts of offshore wind farms on bat migration over marine waters.

In this context, Division II 5.3 is also concerned with the development of species-specific conservation strategies in order to reduce the impacts on specific species of various anthropogenic activities primarily in the EEZ and to develop, recommend and establish special conservation measures for such specific species or species groups. This notably relates to marine mammals such as the harbour porpoise but also, for example, to fish, benthic species and numerous rare and threatened bird species such as red-throated and black-throated divers.

Division II 5.3 has performed groundbreaking work in recent years, for example with the establishment of the 2K criterion (in the mid-2000s) for the protection of sensitive benthic species by limiting sediment warming from the operation of undersea cables.

With regard to bird species, Division II 5.3 has played a decisive role during the last 15 years in advancing the conservation of divers (black-throated and red-throated divers, *Gavia arctica* and *Gavia stellata* – see Fig. 13 left), for which the German North Sea and Baltic Sea EEZ contain wintering areas that are important on a European scale. Habitats for these two species, which are subject to a strict species conservation regime, are increasingly threatened as a result of the deterrent effects of offshore wind farms and potential shipping routes through the North Sea. With a position paper on divers in 2009 (Seetaucherpositionspapier, 2009), BfN presented for the first time a detailed specialist assessment on the basis of which at least no new offshore wind farms are allowed to be approved in the main concentration area of these species in the North Sea.

Fig. 13: left Black-throated diver (*Gavia arctica*) (photo S. E. Arndt)
right Harbour porpoise (*Phocoena phocoena*) (photo Photoshot/Juniors Wildlife)

The current work focuses continue to be on the conservation of benthic species and threatened bird species. In addition, Division II 5.3 performs successful work to protect harbour porpoises (see Fig. 13 right) from underwater noise in relation to reducing pile driving noise when laying the foundations of offshore wind turbines, and has brought about the establishment of a maximum exposure level, the validity of which has been confirmed in a BfN research project (Schallschutzkonzept für die Nordsee, 2013). The sound energy under water at a radius of 750 m around the sound source is thus not allowed to exceed a sound event level (SEL) of 160 dB re 1 mPa²s and a peak sound pressure level of 190 dB re 1 mPa.

In continuation of activities in the areas described, specific future work focuses will be as follows:

- Bringing about the adoption of the 2K criterion by international bodies;
- Contributing to the development of further technical solutions for compliance with the 2K criterion and other noise prevention and mitigation techniques for offshore wind turbines;

- Concluding the development of and quickly implementing a noise protection strategy for harbour porpoises in the Baltic Sea having due regard to the special risk situation of Baltic Sea harbour porpoises and the hydrographic characteristics of the Baltic Sea;
- Assessing potential habitat losses and pressures caused by anthropogenic factors for seabirds such as the long-tailed duck, whose most important wintering area lies within the German nature conservation areas in the Baltic Sea EEZ and whose current population trends give cause for concern.
- Prospective analysis and synoptic forecasting of potential ecosystem effects and consequences of the expansion of offshore wind power in the German North Sea and Baltic Sea based on currently available data on habitat types, habitats and species.

Division II 5.3 is involved on a large scale in the activities of relevant work groups under regional and international conservation agreements dealing with anthropogenic activities. Alongside involvement in work under the regional OSPAR Convention and Helsinki Convention, this notably also includes intensive work for the conservation of the Antarctic. Current focuses comprise marine mammals, seabirds, hydroacoustics and marine spatial planning.

The main work focuses in this area are consequently as follows:

Activities for conservation of the Antarctic:

The Antarctic continent is one of the few large contiguous regions of the earth that has remained subject to relatively little anthropogenic pressures. Even here, however, growing pressures have made international arrangements for conservation of the unique diversity of life essential. The Antarctic Treaty System (ATS) consists of the Antarctic Treaty (AT) of 1959, the Convention for the Conservation of Antarctic Seals (CCAS) of 1972, the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) of 1980, and the Protocol on Environmental Protection to the Antarctic Treaty (PEPAT) of 1991. Under the ATS, all human operations must be assessed for their environmental effects. BfN is charged here, among other things, with producing opinions on nature conservation questions such as evaluating and assessing applications for German research activities in the Antarctic.

Here too, BfN's involvement has brought important successes, although it has also led to much discussion with research institutions and agencies. For example, noise-intensive research projects using airguns must now give greater regard to the conservation of marine mammals.

Specifically, this work area currently comprises:

- Compilation of nature conservation opinions on German activities (mainly research) as an enforcement task assigned to BfN under the Antarctic Environmental Protocol via the national Act Implementing the Protocol on Environmental Protection (AUG) and under the Convention for the Conservation of Antarctic Seals (CCAS);
- Scientific and nature conservation-related involvement in the designation of marine protected areas in the Antarctic under the framework of the CCAMLR (see below);
- Participation in Antarctic Treaty Consultative Meetings (ATCMs) and the Committee for Environmental Protection (CEP).

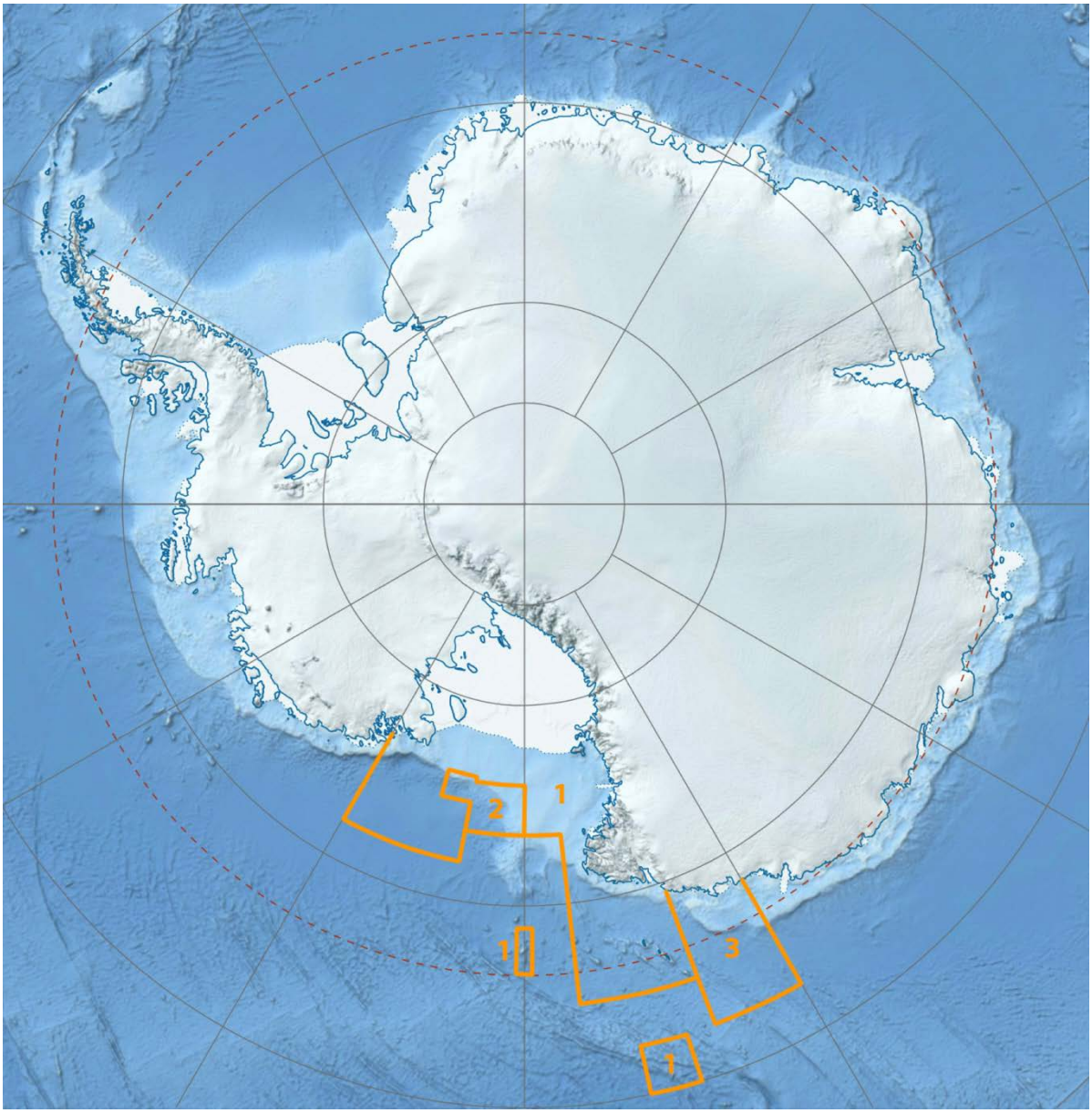

Fig. 14: The Ross Sea MPA in the Antarctic, at 1.55 million km² currently the largest marine protected area in the world (commencing 1 January 2017); 1: General Protection Zone with three sub-areas; 2: Special Research Zone; 3: Krill Research Zone (map NordNordWest, https://creativecommons.org/licenses/by-sa/3.0/legalcode)

This work is to continue in the future. Even in these remote marine regions, there are increasing pressures from anthropogenic use, for example as a result of growth in fishing and tourism. Research activities are more likely to increase than to decrease. This will therefore continue to be an important work area for the Marine Nature Conservation Directorate, especially given the intensive international debate concerning Antarctic marine protected areas to which BfN actively contributes on the basis of its longstanding involvement in marine protected areas under other regional marine conservation agreements.

Alongside continuing the current activities just described, key future work focuses regarding the Antarctic are consequently as follows:

- Supporting protection of the Antarctic Ross Sea Marine Protected Area (RSMPA) (see Fig. 14), in particular in compilation of the detailed management plan;
- Lead involvement in completing the management plan for the Antarctic Weddell Sea MPA proposed by Germany.

Further work areas within Division II 5.3 include nature conservation-related consulting and opinions on anthropogenic activities in the marine environment in other marine regions where BfN is involved under administrative procedures of other federal agencies. An example is deep sea mining. On the basis of administrative procedures coming under the Federal Environment Agency (UBA), for example, Division II 5.3 compiles nature conservation-related opinions for environmental impact assessments of German projects for mineral resource prospecting and extraction. UBA also involves Division II 5.3 in drafting international regulations of the International Seabed Authority (IAS) on the exploitation of seabed resources. BfN is involved together with UBA in the development of a mining code for the extraction of deep seabed mineral resources, for which Division II 5.3 will provide opinions and assessments on this code in the future.

Marine mammals and hydroacoustics work area:

This currently comprised the following main areas of activity:

- Scientific support for international and regional agreements for the conservation of marine mammals (IWC/ASCOBANS);
- Contributing to the development of national management plans for marine mammals;
- Participating in working groups on marine mammals and/or hydroacoustics within national, regional and international bodies (BLANO Fach-AG Energie/Unterwasserlärm (Federal-Länder working group on energy and underwater noise); OSPAR ICG Noise; HELCOM Seal Expert Group and EN Noise; EU-TG Noise);
- Compiling the scientific basis for impact assessments;
- Funding and supervising research into the genetic differences between harbour porpoise populations in the Baltic Sea.

This work area additionally includes researching and evaluating the impacts of, among other things, underwater impulse noise on marine organisms as generated in the construction of offshore wind turbines and in seismic surveys (see page 25/26 and 27). Impacts on marine mammals of continuous noise from shipping and other anthropogenic sources are also studied and evaluated.

Future work focuses in the years ahead will comprise:

- Researching and analysing the impacts of sound-induced disturbance of harbour porpoises at population level;
- Studying the impacts of continuous noise on marine biota;
- Developing limit values (national and international) for underwater noise;
- Contributing to the development of an impact indicator for underwater noise necessary under the MSFD.

Nature conservation-related aspects of marine spatial planning:

Future spatial planning in the German EEZ will aim to guide the various uses of the marine environment more effectively and sustainably. A marine spatial plan is to be formulated for the North Sea and Baltic Sea with guiding principles on spatial development and objectives and principles for functions and uses. This also includes the designation of priority and reserve areas or sites for specific uses. BfN has already conducted work in the past on proposals and approaches for giving greater consideration to nature conservation aspects, including the designation of specific priority or reserve areas or sites for specific conservation purposes in marine spatial planning. This work in the area of marine spatial planning, including integrated marine and coastal zone management, will be further intensified in the years ahead, comprising the following individual responsibilities for Division II 5.3:

- Opinions on nature conservation-related aspects of marine spatial planning
    - in connection with plan compilation/amendment;
    - in the formulation of visions for the marine environment;
    - in the revision of legislation such as the Federal Spatial Planning Act (ROG).
- Representing BfN in international working groups (notably within HELCOM and the EU). An important objective here is the integration of the ecosystem approach in marine spatial planning;
- Comprehensive overhaul of BfN's nature conservation-related planning input from 2006 for a necessary and soon to be expected revision of the marine spatial plans for the German North Sea and Baltic Sea.

6 Looking ahead

The previous sections of this paper have shown what an extensive range of responsibilities are covered by the BfN Marine Nature Conservation Directorate. Also described in detail are the activity areas that lie ahead in years to come. The multitude and disciplinary breadth of national and international responsibilities involved, and the resulting demands in terms of time and personnel, highlight the immensity of the challenges faced by the Marine Nature Conservation Directorate in delivering on its international obligations and national enforcement tasks. The BfN Marine Nature Conservation Directorate contracts out the actual performance of certain tasks such as vertebrate or benthos monitoring to a range of research institutes and scientific consultants in numerous research projects. Across all work areas, however, specialist support, coordination, verification, acceptance and analysis of the output of up to 100 external scientists researching under contract or as grant recipients, as well as the derivation of workable recommendations, all remain entirely with BfN.

For the staff of the Marine Nature Conservation Directorate, it is very important at all times, even in the hustle, bustle and stress of the everyday working routine, to focus on overarching goals and see the strategic direction in their work.

The following **work focuses and objectives** in national, European and global marine nature conservation are consequently defined for the Marine Nature Conservation Directorate for the years ahead:

- **Safeguarding threatened species and habitats/conserving marine biodiversity**

  Many vulnerable marine species are declining in population and their survival is threatened. The degradation of marine habitats continues. These trends must be countered. The diversity of marine animal and plant life, including habitats together with their interdependencies and ecological functions, must be safeguarded or restored for the future. The Marine Nature Conservation Directorate works intensively to advance research into, knowledge of and the conservation of marine species and habitats, with the main focus on the North Sea and Baltic Sea, but also under regional marine conservation agreements and globally.

- **Effective administration and management of protected areas on our own doorstep**

  The ten Natura 2000 protected areas in the German North Sea and Baltic Sea EEZ were notified to the EU as long ago as 2004 but only fully recognised as German nature conservation areas in the EEZ with the enactment of protected area ordinances at the end of September 2017 (Verordnungen Bundesgesetzblatt 2017, Teil 1, Nr. 63). It is now necessary to establish a comprehensive, effective management with a fully functioning administration and detailed monitoring in order to significantly improve the condition of marine biodiversity in the German EEZ nature conservation areas. As effective management involves balancing user interests, BfN will also have to step up its activities around issues of public acceptance for the protected areas. Implementation is a mammoth task that will require a major staffing increase above current levels – and not only in Directorate II 5.

- **Establishing a marine protected area network**

  A coherent network of marine protected areas in German, European and global waters with adequate conservation measures for their natural development serves the purpose of securing refuge areas for marine species, generating spillover effects, among other things for fish stocks, and conserving marine habitats. The Marine Nature Conservation Directorate will continue its activities around the identification, designation and coherence of MPAs in national and international marine areas and supports the development and

establishment of effective management measures. This takes place under the framework of international agreements and guidelines such as the United Nations Convention on the Law of the Sea (UNCLOS), the Convention on Biological Diversity (CBD), the OSPAR Convention and the Helsinki Convention, and to a rapidly increasing degree extends to regions of the Arctic and Antarctic as well as the global MPA network with the support of the GOBI initiative.

- **Avoiding or reducing negative impacts of human activities on the marine natural environment**

  Current human uses of German and international marine areas cause ever greater harm to the marine natural environment. This applies most of all to fisheries, but also to operations in the marine environment relating to offshore wind power, shipping, marine mining, etc. The Marine Nature Conservation Directorate will also continue its very substantial efforts in connection with the avoidance and reduction of negative effects of human activities, promoting environment-friendly methods and technologies both nationally and in the context of international agreements and bodies. Examples include the avoidance and mitigation of underwater noise, oil/gas prospecting, offshore wind power and harm to species and habitats from sand and gravel extraction or deep sea mining.

- **Achieving sustainable fisheries**

  Exploitation of the seas continues, especially with a view to the use of fish stocks. The Marine Nature Conservation Directorate aims to explore sustainable fishing methods and to promote initiatives for the sustainable use of fish stocks, wherever possible with intensive involvement of fisheries researchers and fishing operators. It will contribute towards this aim both nationally and internationally under the EU Common Fisheries Policy and with regard to eco-labelling schemes for fisheries. The impacts of recreational fishing in marine areas off the German coast will also be subjected to further analysis.

- **Achieving good environmental status of the marine environment**

  The MSFD sets a target of achieving good environmental status of the marine environment by 2020. With the current, not very effective action, it is already apparent that this target is unattainable for German and European marine waters. The Marine Nature Conservation Directorate nonetheless aims to continue the necessary efforts for implementation of the MSFD both nationally and at regional (OSPAR and HELCOM) and European level and to work towards attainment of good environmental status. Work is to continue on advancing the necessary approaches for comprehensive indicator-based ecological assessment as well as the development of management strategies and exposure thresholds and on securing their adoption under regional marine agreements.

- **Comprehensive monitoring of German marine areas**

  Good marine monitoring enables early identification of both positive and negative trends in the marine natural environment and pressures to which it is exposed, and also provides a means of verifying the success and effectiveness of conservation and management measures. Marine monitoring will therefore always retain very high priority for the Marine Nature Conservation Directorate as a fundamental basis of its work – including in the EEZ marine protected areas, where it is necessary to conduct regular on-site evaluations and controls.

- **Exemplary species and habitat conservation measures**

  The Marine Nature Conservation Directorate will continue working to promote specific marine species and habitat types that serve as key or representative species or habitats in the ecosystem context. A successful example comprises the projects for the breeding and reintroduction of the European and Baltic sturgeon – selected as a UN Decade on Biodiversity project – as sturgeon are representative of many anadromous migratory fish and other species with similar habitat needs. Additional species and habitat types whose survival, stabilisation or reintroduction benefit many other threatened biota by means of suitably adapted management are to be supported with the aid of special conservation measures. Examples include the European flat oyster in the North Sea – which as a habitat former for biogenic reefs with species-rich biocoenoses is important for the conservation of marine biodiversity as a whole – and Baltic Sea harbour porpoises.

- **Ecosystem approach in marine spatial planning**

  It is especially important to further develop and apply the ecosystem approach in the management of human activities in the marine environment under the OSPAR and the Helsinki Convention in observation of the precautionary and the polluter pays principles. This notably also applies in marine spatial planning, where greater consideration is to be given to nature conservation aspects. The objective is, with the support of good future marine spatial planning, to achieve ecosystem-friendly, sustainable use of the marine environment that does not harm marine biodiversity and recognises the sustainability limits of marine ecosystems as a non-negotiable frame of reference for spatial planning.

- **Marine habitat mapping in the German EEZ**

  Knowledge of the geographical distribution of Red List habitat types, natural habitat types under Annex 1 of the Habitats Directive and protected habitat types under Article 30 of the Federal Nature Conservation Act (BNatSchG) both inside and outside of protected areas is essential to many of the above-mentioned nature conservation tasks in the German North Sea and Baltic Sea EEZ. In the years ahead, the Marine Nature Conservation Directorate will consequently work intensively together with external partner institutions on further improving the available data. The aim, as before, is a full cartographic record of all habitat types in the German EEZ by around 2022. Full mapping of the Natura 2000 protected areas has special priority here.

Conscious of the challenges and its responsibilities, the Marine Nature Conservation Directorate, in advancement of the above-listed work focuses and objectives, will continue its dedicated work at many different levels for the conservation of marine biodiversity.

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