MARINE PROTECTED AREAS EUROPE

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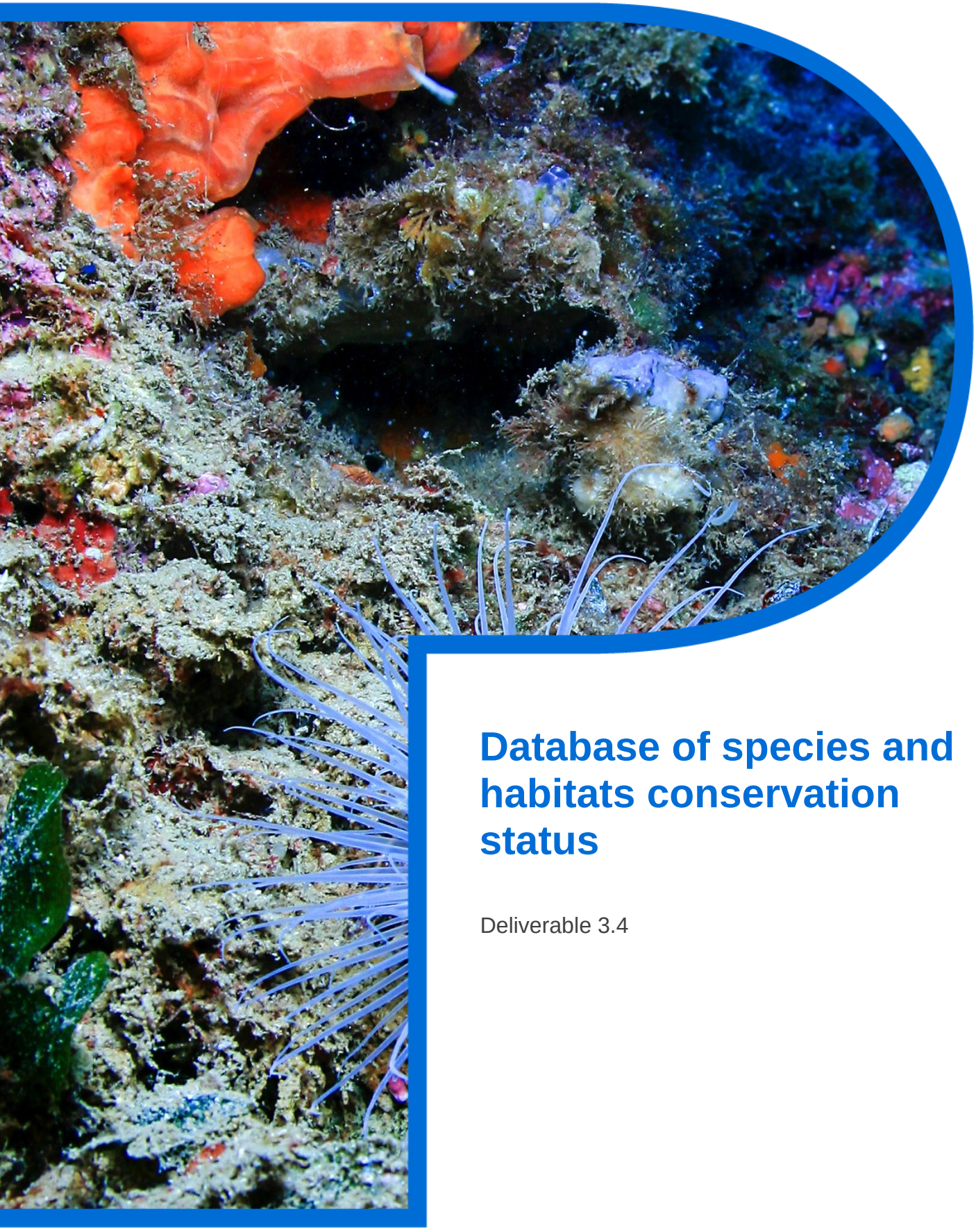

Database of species and habitats conservation status

Deliverable 3.4

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The MPA Europe project

MPA Europe is a project co-funded by the European Union (EU) that will map a network of locations representative of biodiversity in European seas (Atlantic Exclusive Economic Zones of the EU and its neighbours, and all the Mediterranean, Baltic, and Black seas) (Figure A).

Figure A. MPA Europe study area.

This network will indicate where to prioritise placement of Marine Protected Areas (MPA) for biodiversity protection and how Maritime Spatial Planning (MSP) can maximise blue carbon benefits. By using a holistic set of biodiversity measures, from species to ecosystems (including habitats), and environmental data including carbon storage, water currents, and climate change velocity models, it will be possible to quantify and map both the present and future connectivity within the proposed MPA network. The multiple scenarios provided will support wider and improved MSP by policy makers, industry, and non-governmental organizations (NGOs). The major scientific areas of the project and its outcomes are summarized in the infographic presented in Figure Figure B.

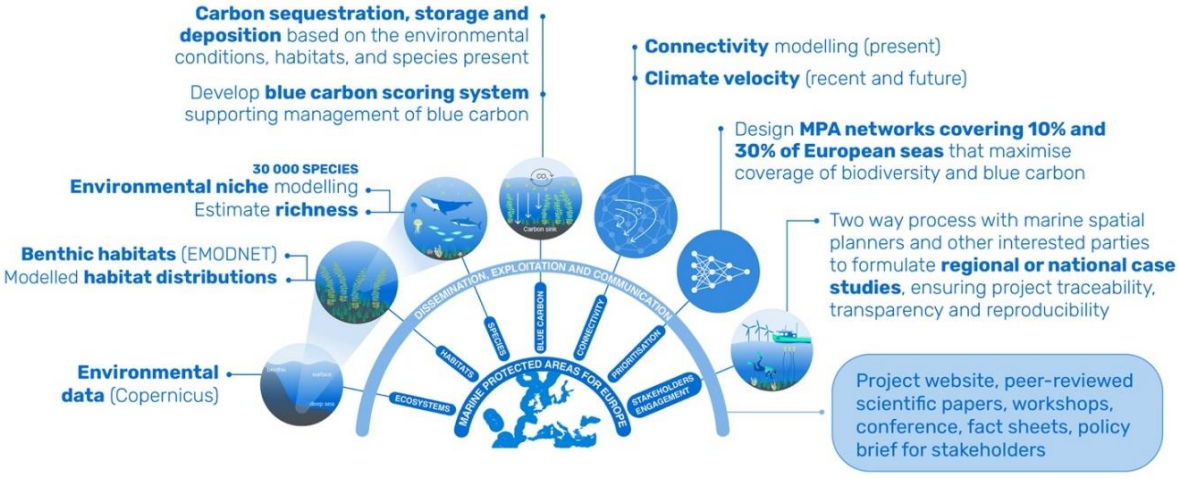

Figure B. MPA Europe project scientific areas

The inter-disciplinary approach of MPA Europe is supported by a diversity of partners. These include Nord University (Norway), the Intergovernmental Oceanographic Commission of UNESCO (Belgium), Aarhus University (Denmark), Climazul (Greece), the Centre of Marine Sciences (Portugal), Science Crunchers (Portugal), the Joint Nature Conservation Committee (England, UK), the Scottish Association for Marine Science (Scotland, UK), the Ocean University of China (China), and the University of the Ryukyus (Japan). The partners include experts in marine biology, taxonomy, ecology, oceanography, biogeochemistry, and biogeography, MPA network design, benthic habitat mapping, carbon dynamics, species distribution, climate modelling, and MSP compose the MPA Europe team.

Deliverable 3.4 overview

The goal of this deliverable is to compile datasets of marine species and habitats of conservation importance in Europe, retrieving information from European policies and other main sources. The information provided is crucial for policy-relevant research focusing on marine protected area (MPA) designation, in particular, mapping biodiversity patterns. It will feed the main subsequent tasks of Prioritisation (WP5), which aim to design (prioritise locations for) MPA networks using a systematic conservation planning approach maximising the coverage of marine biodiversity.

Introduction

With the increasing pressure of human activities on marine ecosystems, researchers and governmental agencies have conducted several assessments of the conservation status of marine species and habitats in the last decades; e.g., the European Red List of Species (EEA, 2024a) and Habitats (European Commission et al, 2016; EEA, 2024b). Those assessments should be used to support the conservation of species, habitats and biologically relevant areas in Europe. However, such critical information is scattered in multiple sources, which can hinder its broad use in marine spatial planning. Nevertheless, assessments can have distinct spatial and taxonomic coverages, different threat classifications, and use different underlying indicators (Heiskanen et al. 2016).

One critical assessment is the 'European Red List of Habitats', published in 2016 by the European Commission et al. (2016). For marine habitats they reviewed the data available across the four main regions of Europe and assessed each habitat against the following criteria:

- Criterion A. Reduction in quantity (area or distribution)
    - A1 Present decline (over the last 50 years)
    - A2a Future decline (over the next 50 years)
    - A2b Future and/or present decline (over a 50-year period)
    - A3 Historic decline
- Criterion B. Restricted geographic distribution
    - B1 Restricted Extent of Occurrence (EOO)
    - B2 Restricted Area of Occupancy (AOO)
    - B3 Present at a few locations
- Criterion C. Reduction in abiotic quality
- Criterion D. Reduction in biotic quality
    - C/D1 Reduction in quality over the last 50 years
    - C/D2 Reduction in quality in the future or in a period including
    - present and future
    - C/D3 Historic reduction in quality
- Criterion E. Quantitative analysis of the probability of collapse

Based on the extent to which they met the criteria, each habitat was assigned one of the following IUCN Red List categories:

- Collapsed (CO)
- Critically Endangered (CR)
- Endangered (EN)
- Vulnerable (VU)
- Near Threatened (NT)
- Least Concern (LC)
- Data Deficient (DD)
- Not Evaluated (NE)

Predominantly, the habitats were level 4 of the marine section of the European nature information system (EUNIS) v2007-11 classification system; these are generally broad physical descriptions of the habitats, such as A5.11 Infralittoral sand. But they also included some regional sea-specific habitats, particularly from the Baltic Sea and the Mediterranean Sea, as well as recently proposed additions and information from national schemes. The same exercise was also carried out for nine EUNIS level 5 habitats to explore the outcomes of working at a more detailed level.

The habitats were assessed separately for each of the four regions shown in Figure 1.
As a result, the same EUNIS (v2007-11) code may have a different conservation status in different regions.

The MPA Europe prioritisation analyses being undertaken in this project (see WP5) will use the most up-to-date information on the spatial extent of threatened marine habitats. The European Marine Observation and Data Network (EMODnet) is the central repository for in situ habitat data, including:

1. Habitat maps derived from in situ and remote sensing surveys (i.e., polygons);
2. Ground-truthing observations that have attributed with habitats (i.e., point records);
3. Predictive habitat models (usually in the form of probability maps on a scale of 0-1).

EMODnet users may access these spatial datasets via:

- Map Viewer – here, users can view the data and click to see more information, such as habitat, confidence assessment and metadata.
- Download via the metadata catalogue – here, users can download a copy of the data and have full access to the information contained in the attribute table.
- Application programming interface – using web map services and web feature services, users can stream the data directly from EMODnet servers to their desktop or web-based mapping application.

EMODnet currently publishes data on habitats classified according to most of the designations listed in this document, including Habitats Directive Annex I (Council Directive 92/43/EEC), the threatened and/or declining habitats from Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), the priority habitats identified under the Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution (https://www.unep.org/unepmap), as part of the Global Ocean Observing Systems Biological and Ecosystem Essential Ocean Variables, which are also listed under the Kunming-Montreal Global Biodiversity Framework, and FAO's Vulnerable Marine Ecosystems. However, until now, if a user wanted to produce a map showing the extent of each IUCN Red List category in an area, they would have to access the habitat map (e.g., from EMODnet or their own data holdings) and separately find the table of Red List categories for marine habitats from the European Environment Agency (EEA), and subsequently join the information together.

As custodians of the EMODnet Seabed Habitats data holdings and a partner in MPA Europe, the Joint Nature Conservation Committee (JNCC) identified the opportunity to streamline this process for users, while increasing the visibility of the Red List categories assigned to Europe's marine habitats by attaching the categories to the habitat layers available via EMODnet, so that the categories are immediately available as part of the habitat dataset, whichever way it is accessed. As well as having a wider benefit to users, it will provide the existing marine habitat data to the marine protected area (MPA) prioritisation tool in a ready-to-use format.

Beyond the European Red List of Habitats, there are other policies and assessments that should be considered in the prioritisation of areas for MPA implementation. Thus, in this report, we also collated information on the growing number of designations of species' and habitats' conservation status in Europe, and harmonised them in a list that can feed into the prioritisation process. Introduced and invasive species are also an important phenomenon and some contribute to a loss of native biodiversity, habitat homogenization and ecological regime shifts, representing a threat to the biodiversity and functioning of natural ecosystems (Steibl, 2024). We listed species introduced to Europe to either negatively score or exclude them from the prioritisation process (a decision that will

be made during the next step of the project). Together with the additions to the EMODnet Seabed Habitats, this revision provides a broad and complete overview of the current conservation status of species and habitats, whose information will be used to attribute weights (i.e. importance) to species and habitats in the prioritisation software during the MPA Europe prioritisation analyses (WP5).

Methods

Conservation status of marine species in Europe

Multiple policies and assessments address the conservation status of marine species occurring in European waters:

- Habitats Directive (Council Directive 92/43/EEC);
- Birds Directive (Directive 2009/147/EC);
- Common Fisheries Policy Regulation (Regulation (EU) No 1380/2013);
- Technical measures Regulation (Regulation (EU) 2019/1241)
- Marine Strategy Framework Directive (Directive 2008/56/EC);
- Marine Action Plan (COM/2023/102 final);
- Oslo-Paris Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR, https://www.ospar.org/);
- Helsinki Convention (HELCOM, Baltic Marine Environment Protection Commission, https://helcom.fi);
- Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution (https://www.unep.org/unepmap);
- Commission on the Protection of the Black Sea Against Pollution (Black Sea Commission, http://www.blacksea-commission.org/);
- International Council for the Exploration of the Sea (ICES) regional lists of threatened species of conservation interest;
- International Union for Conservation of Nature (IUCN, www.iucn.org) Red List of globally Threatened Species that occur in Europe; and
- European Red List of Threatened Species.

We individually considered each policy or list that provided information on the conservation status of marine species in Europe (Table 1). When possible, the full lists were downloaded from the institutional websites. However, in many cases information was embedded in reports or policy instruments (e.g., a dashboard) and values were manually retrieved. Some of the assessments or policies are reviewed frequently, thus in addition to the source document, we have also provided the version and date of access on Table 1.

Once lists were obtained, species names were checked against the World Register of Marine Species (WoRMS) for taxonomic validation. This process was also used to filter species that were not marine or brackish, as some assessments additionally cover terrestrial and freshwater taxa.

Aggregation of conservation status lists

Lists were aggregated according to higher taxonomy. Thus, for each taxon we assessed the conservation status across the multiple lists. If a taxon was not covered by any additional list, the value for those additional lists was marked as not available. We did this process separately for lists attributing Red List status (IUCN Red List global, EU Red List and HELCOM Red List) and for those attributing other types of conservation status (Habitats Directive, Birds Directive, OSPAR, HELCOM, Barcelona Convention, and Black Sea Commission).

For all the lists we produced a summary column synthesising (harmonising) the multiple classifications, for use in the prioritisation analyses. Species were classified as either of "Conservation Importance" or "Threatened". The first was attributed to all species that were cited by any policy or document, but for which no status was given (or for which the status could not be translated to one of the IUCN Red List categories). Species received the status of "Threatened" if they had a Red List status of Vulnerable, Endangered or Critically endangered.

To aggregate the information of Red Lists, if only a single classification was available, then this value was used as the conservation status of the species. When multiple values were available, we generally applied the precautionary principle keeping the most conservative approach. Therefore we proceeded in the following way:

1. If HELCOM Red List and EU Red List were available, we prioritised EU Red List over HELCOM, because the former is regional;
2. When the EU Red List and IUCN Global Red List were both available, we prioritised the one that was more restrictive (or used the same value, if both agreed);
3. When the HELCOM Red List and the IUCN Global Red List were available, we prioritised the most restrictive one, except if the HELCOM Red List had the status of "Regionally Extinct" (RE). In that case we use the status of the Global Red List.

Species that were not cited by any policy/document and had status "Near Threatened", "Least Concern" or "Data Deficient" were excluded.

Conservation status of marine habitats in Europe

As similarly done for the species, we individually considered each policy or list that provided information on the conservation status of marine habitats in Europe (Table 2). Lists were aggregated according to the exact names of specific habitats mentioned in the document. When possible, we added the equivalency to EUNIS habitat categories. Following the same rules applied to the species, habitats were classified as either "Threatened" or of "Conservation importance", and habitats that were not cited by any policy/document and had status "Near Threatened", "Least Concern" or "Data Deficient" were excluded.

Incorporating Red List status to habitat maps on EMODnet

To achieve the aim of attaching the Red List categories to the habitat layers available via EMODnet, we:

1. Prepared look-up tables that enabled us to attribute the conservation status categories to any dataset that has been classified to either EUNIS v2007-11, EUNIS v2022 or Annex I of the Habitats Directive.
1. Joined the look-up tables to habitat layers on the EMODnet servers so that the Red List categories are available as part of the habitat layers provided to the EMODnet Map Viewer and the EMODnet application programming interface.
2. Altered the pop-up boxes on the EMODnet Map Viewer so that the Red List category appears alongside the habitat.
3. Added filter options to the habitat layers on the EMODnet Map Viewer so that users can filter the habitat layers by Red List category.
4. Altered the queries that control the layers published via the application programming interface so that users can access the Red List categories as part of the habitat layers provided by the EMODnet application programming interface.
5. Joined the look-up tables to downloadable habitat datasets available via the EMODnet metadata catalogue.

Preparing the look-up tables
A spreadsheet version of the European Red List of Habitats was downloaded from the EEA website (EEA, 2024b). For marine habitats it provided three relevant sheets:

- "Marine" - Marine Red List of habitats compact view – this contained a single row for each assessed habitat per region. The assessed habitats were usually taken from the EUNIS v2007-11 classification system, except in the Baltic Sea, which used the HUB classification system. This was to be used to form the basis of the look-up table for adding Red List status to EUNIS v2007-11 classified maps on EMODnet.
- "Marine cross to EUNIS 2022" - Crosswalk from marine types to EUNIS classification 2022 with each crosswalk in a separate row – this contained a single row for each EUNIS v2022 habitat and their relationships to the assessed habitat. Sometimes an assessed habitat is related to more than one EUNIS v2022 habitat and is replicated on multiple rows. This was to be used to form the basis of the look-up table for adding Red List statuses to EUNIS v2022 classified maps on EMODnet.
- "Marine cross to Annex I" - Crosswalk from marine habitats to Habitats Directive Annex I with each crosswalk in a separate row – this contained a single row for each Habitats Directive Annex I habitat and their relationships to the assessed habitat . However, because Habitats Directive Annex I habitats are so broadly defined, assessed habitats always related to more than one Annex I habitat and were replicated on multiple rows. It was therefore impossible to create a useful look-up table for extracting a Red List category from an Annex I habitat.

Before these tables could be used to attribute Red List categories to habitats, they needed to be reformatted to meet the following criteria:

- The classification system must be precisely defined for each habitat in the look-up table so that a separate look-up table could be created for each classification system. This is important because the classification system determines which columns and which EMODnet habitat layers to attach the look-up tables to. For the EUNIS 2022 habitats this is clear, but the original assessed habitats (columns Red List habitat name/Red List habitat code) is a combination of EUNIS v2007-11, HELCOM Underwater Biotopes and others. Therefore these needed to be split out and categorised according to their classification system.
- There should be only one conservation status category per habitat code. Some non-standard habitat codes related to more than one habitat name, and subsequently, more than one Red List category. These duplicates were usually removed.
- Column names should be self-explanatory – see Table 3.

Joining the look-up tables to habitat layers on the EMODnet servers
The seabed habitat layers available via EMODnet are stored in a PostgreSQL database. This a relational database, which means that tables can easily be joined together as long as they have a column containing matching information.

The relevant column in this case is the Habitat code (short name: HabCode). With the properly formatted look-up tables, as prepared in the previous step, it is possible to join the Red List category to any dataset that contains information on the habitat in one of the classification systems included in the look-up table.

There are two ways to join the information:

1. On the fly: the look-up table is joined to the habitat data every time a layer is sent to the Map Viewer. This is more flexible because it doesn't change the habitat datasets and can be done

by simply changing the query that generates each layer. However, it can extend the loading time of the layers.

2. Add a new column to permanently embed the Red List categories in the datasets: this option is preferred for optimum loading time of layers, but needs to be done separately for each dataset so is more time-consuming.

We opted for option 2 and prioritised joining the information to the EUNIS version 2007-11 classified data as this included most of the habitat data available via EMODnet.

Altering the pop-up boxes on the EMODnet Map Viewer so that the Red List category appears alongside the habitat

When a user right-clicks on a seabed habitat map layer in the EMODnet Map Viewer they are presented with detailed information about the habitat they have selected. This is controlled with HTML and can be customised per layer. We amended the HTML template for the layers mentioned above so that the Red List conservation status is presented to the user as standard.

Adding filter options to the habitat layers on the EMODnet Map Viewer

Some layers in the EMODnet Map Viewer contain a lot of information and some layers are provided with filter options to help to distil the information that is of interest to the user (Figure 2).

The ability to filter the habitat layers by Red List conservation status will allow users to quickly view the extent of threatened habitats in Europe. New filters must be requested by the EMODnet central portal team.

Joining the look-up tables to downloadable habitat datasets

As explained in step 3, all publicly available EMODnet data is available via web services, meaning that the user does not usually have to download the data to their local machine in order to use it. However, for those users who do download the data, a step was required to attach the Red List information to every habitat dataset that is available to download – this amounts to over 800 habitat maps.

This was achieved using a Python script, which iterated through the datasets in PostgreSQL, extracted them one by one according to each dataset's unique identifier, exported a unique Shapefile, which was then zipped into a zip file, and placed online.

Introduced and invasive marine species in Europe

The World Register of Introduced Species (WRiMS, Costello et al. 2021), as well as the European Invasive Alien Species (IAS) Regulation (Regulation (EU) No 1143/2014) developed by European Council and Parliament and associated information system European Alien Species Information Network (EASIN, https://easin.jrc.ec.europa.eu/) provide information on introduced and invasive marine species (Table 4).

We aggregated both lists according to taxonomy and assigned their introduced status. Species names were checked with the World Register of Marine Species (WoRMS) for taxonomic validation.

Results

Conservation status of marine species in Europe and invasive species list

Ten policies and assessments were considered, including three assessments that attributed Red List status. A total of 18,458 marine species were assessed by either one or more of these policies.

However, 89% of the evaluated species were classified as non-threatened categories (i.e. Near Threatened, Least Concern, Data Deficient) and were excluded from further analyses. This rendered a total of 11% (i.e. 2,022) of marine species identified as either of Conservation Importance (9%) or Threatened (91%) (Table 5). The list includes the species protected against exploitation. A simplified list of the species and their conservation status is available in Table 6. A comma-separated database with full details is supplied as Supplementary Material to this report (see MPAEU_D3_4_threatened_species_list.csv; MPAEU_D3_4_threatened_species_fulltaxonomy.csv; MPAEU_D3_4_threatened_species_README.csv).

Although the ICES indicates vulnerable animal and plant groups, the database does not provide the name of the species. Therefore, we decided to exclude this source from our documents for species conservation status. Similarly, Marine Action Plan (COM/2023/102 final) indicates the protection of groups of marine species and habitats, but we decide to exclude it as sources since it relies on other legislations already considered in this deliverable. Finally, Marine Strategy Framework Directive (Directive 2008/56/EC) provides a list of species and habitats that should be considered as indicators for the evaluation of the Good Environmental Status (GES), however the assessment is spatially incomplete, and we exclude it as source.

For invasive species, our list included 1,795 introduced and invasive species in European seas. A simplified list of the invasive species and their status is available in Table 7. A comma-separated database with full details is supplied as Supplementary Material to this report (see MPAEU_D3_4_invasive_species_list.csv; MPAEU_D3_4_invasive_species_README.csv).

Conservation status of marine habitats in Europe

Five policies and assessments were considered, including two assessments that attributed Red List status. A total of 1,614 marine habitats and protected areas were listed as relevant habitat or protected area by either one or multiple policies. However, 94% were excluded because they were either areas (23%) or because they were classified as no-threatened categories (i.e. Least Concern, Data Deficient) or were coastal habitats (71%). The list of marine protected areas will be used in a second step of prioritisation and designation of MPA network. We excluded all coastal habitats because they are out of the scope of the project. We also excluded high level physical habitats (i.e. that are too broad in concept) as they cannot be included in the prioritisation. This rendered a total of 6% (i.e., 97) of specific habitat types identified as either of Conservation Importance (54%) or Threatened (46%). A simplified list of the marine habitats and their conservation status is available in Table 8. A comma-separated database with full details is supplied as Supplementary Material to this report (see MPAEU_D3_4_threatened_habitats_list.csv; MPAEU_D3_4_threatened_habitats_README.csv).

Although the IUCN Red List of Ecosystems (https://iucnrle.org/) contains information on the global status of conservation for marine ecosystems, the database does not provide a European Assessment of the marine habitats but only a few ones at national level (e.g. France, Italy, Finland). Therefore, we decided to exclude this source from our review.

Incorporating Red List status to habitat maps on EMODnet

Preparing the look-up tables

A spreadsheet with completed look-up tables are supplied as Supplementary Material to this report (see MPAEU_D3_4_EUNIS-RedList-lookup.xlsx). There are 5 tables in total:

1. EUNIS v2007-11 – Black Sea
2. EUNIS v2007-11 – Med

3. EUNIS v2007-11 – NE Atlantic
4. Assessed habitats – Baltic (EUNIS was not used for Baltic Sea habitats)
5. EUNIS v2022 – all regions

Note that the EUNIS version 2022 version of the look-up table did not need to be split by region because the region is indicated within the habitat code and name.

Joining the look-up tables to habitat layers on the EMODnet servers
In the first instance, we joined the Red List categories to the following layers (as named on the EMODnet Map Viewer):

1. EUNIS 2007 habitat maps (contained within the EMODnet Seabed Habitats > Individual habitat maps from surveys) > Seabed and coastal wetland habitats layer group)
2. EUSeaMap (2023) habitats (EUNIS 2007/full-detail classification) (contained within the EMODnet Seabed Habitats > EMODnet broad-scale seabed habitat map for Europe (EUSeaMap) layer group)

By including this information in PostgreSQL, the information is not only available to EMODnet Map Viewer users, but also available to anybody accessing the EMODnet layers as Web Map Service or Web Feature Service via the EMODnet Seabed Habitats Application Programming Interface. This includes desktop GIS users as well as other applications, such as the developing MPA Europe prioritisation tool.

Altering the pop-up boxes on the EMODnet Map Viewer so that the Red List category appears alongside the habitat.
The HTML templates that control the information pop-ups were updated so that the Red List conservation status is now presented alongside the habitat (Figure 3 and Figure 4).

Adding filter options to the habitat layers on the EMODnet Map Viewer
The development of the EMODnet Map Viewer is centralised and out of the control of the thematic groups such as EMODnet Seabed Habitats, of which JNCC and other MPA Europe partners are a part. However, we do have the power to request developments that increase the accessibility and interoperability of marine data in Europe.

To this end, we have submitted a formal request to add the ability to filter habitat layers so that a user can quickly view the distribution of habitats that fall into a particular Red List category. We will follow up in the coming weeks to ensure that it is implemented in a correct and timely manner.

Joining the look-up tables to downloadable habitat datasets
The habitat maps from surveys that are classified to EUNIS version 2007-11 have all had their download packages updated to include the Red List categories. These files are available via each habitat map metadata record in the EMODnet metadata catalogue.

Conclusions

Our deliverable has compiled an extensive array of policies and assessments of species and habitats conservation status in Europe. These assessments highlight the current threats to marine species and habitats in Europe, with 11% and 6% of the evaluated species and habitat respectively classified as of conservation importance or threatened. Moreover, they underscore significant gaps in our knowledge on the conservation status of species and habitats, with more than 80% considered data deficient.

While the assessments considered here encompass a broad spectrum of biodiversity in Europe, they generally employ distinct methods and classifications, which impedes a harmonised view of the current conservation status. Our effort in harmonising those different approaches for the prioritisation process is a first step, but future research is necessary to better disentangle the differences in methodologies applied.

This deliverable also added value to the European compilation of seabed habitat maps by joining important information on the conservation status of each habitat. This information was previously only accessible in the form of a standalone spreadsheet on another website, thereby making it difficult for anybody to map the spatial extent of these categories. Now, it is embedded within the habitat layers themselves, drawing attention to threats facing many of Europe's habitats and making the data accessible to those who need to use it. Together, those resources should provide an easy to access and easy to use summary of the current conservation status of species and habitats in Europe, providing relevant information for marine spatial planning and conservation action.

Next steps:

- Compare status of species and habitats to highlight any overlaps or links.
- Define the use of introduced and invasive species in Europe in the prioritisation process, evaluating either to negatively score (or weight) a certain species on the prioritisation software, or to exclude those species from the prioritisation process.
- Define the use in the prioritization of broad habitats mentioned in the policies (e.g. estuaries or reefs)

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Regulation (EU) No 1380/2013. Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC. European Parliament, Council of the European Union. http://data.europa.eu/eli/reg/2013/1380/oj

Regulation (EU) 2019/1241. Regulation (EU) 2019/1241 of the European Parliament and of the Council of 20 June 2019 on the conservation of fisheries resources and the protection of marine ecosystems through technical measures, amending Council Regulations (EC) No 1967/2006, (EC) No 1224/2009 and Regulations (EU) No 1380/2013, (EU) 2016/1139, (EU) 2018/973, (EU) 2019/472 and (EU) 2019/1022 of the European Parliament and of the Council, and repealing Council Regulations (EC) No 894/97, (EC) No 850/98, (EC) No 2549/2000, (EC) No 254/2002, (EC) No 812/2004 and (EC) No 2187/2005. European Parliament, Council of the European Union. http://data.europa.eu/eli/reg/2019/1241/oj

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Tables

Table 1. List of sources for species conservation status

Source	URL	Version	Date of access
Bird Directive	http://data.europa.eu/eli/dir/2009/147/oj (https://nature-art12.eionet.europa.eu/article12/progress?period=3&conclusion=bs)	DIRECTIVE 2009/147/EC	April 2024
Habitat Directive	http://data.europa.eu/eli/dir/1992/43/oj (https://nature-art17.eionet.europa.eu/article17/habitat/progress/?period=5&group=Coastal+habitats&conclusion=overall+assessment)	COUNCIL DIRECTIVE 92/43/EEC of 21 May 1992	April 2024
Nature Restoration Law	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0304	Proposal of REGULATION	April 2024
Marine Action Plan	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52023DC0102	COM/2023/102 final	April 2024
Marine Strategy Framework Directive	http://data.europa.eu/eli/dir/2008/56/oj	DIRECTIVE 2008/56/EC	April 2024
Barcelona Convention (Annex 2)	https://www.rac-spa.org/sites/default/files/annex/annex_2_en.pdf		April 2024
Black Sea Commission	http://www.blacksea-commission.org/		April 2024
HELCOM Red List of Habitat and Biotope complexes	https://helcom.fi/baltic-sea-trends/biodiversity/red-list-of-biotopes-habitats-and-biotope-complexes		April 2024
OSPAR List of Threatened and/or Declining Species and Habitats	https://www.ospar.org/documents?v=32794	OSPAR Agreement 2008-06, amended in 2021	April 2024
List of prohibited exploitation (fishes and other marine species)	Regulation (EU) No 1380/2013 on the common fisheries policy http://data.europa.eu/eli/reg/2013/1380/oj Habitats Directive 92/43/EEC (Annexes I-II, IV-V) http://data.europa.eu/eli/dir/1992/43/oj Technical Measures Regulation (Article 31 of Regulation (EU) 2019/1241 (Annex I) http://data.europa.eu/eli/reg/2019/1241/oj *Regulation (EU) 2024/259 on fixing fishing opportunities http://data.europa.eu/eli/reg/2024/259/oj	*this regulation provides an annual list of species for which fishing is prohibited. The list changes annually, thus in this report we have considered the regulation approved for year 2024 only	April 2024
EU Red List species	https://www.eea.europa.eu/en/datahub/datahubitem-view/202f3c2e-54a9-4ff4-a1da-ed7ca524f634	14 Nov 2019	April 2024
IUCN Red List	https://www.iucnredlist.org/ accessed through the R package rredlist	2023-1	April 2024

Table 2. List of sources for habitat conservation status.

Source	URL	Version	Date of extraction
OSPAR List of Threatened and/or Declining Species and Habitats	https://www.ospar.org/documents?v=32794	OSPAR Agreement 2008-06, amended in 2021	April 2024
Nature Restoration Law	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0304	Proposal of REGULATION	April 2024
Marine Action Plan	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52023DC0102	COM/2023/102 final	April 2024
Marine Strategy Framework Directive	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32008L0056	DIRECTIVE 2008/56/EC	April 2024
OSPAR List of Threatened and/or Declining Species and Habitats	https://www.ospar.org/documents?v=32794		
HELCOM Red List of Biotopes, Habitats and Biotope Complexes	https://helcom.fi/baltic-sea-trends/biodiversity/red-list-of-biotopes-habitats-and-biotope-complexes/ https://archive.iwlearn.net/helcom.fi/Recommendations/en_GB/rec21_4/index.html#	2013	April 2024
ICES Vulnerable Marine Ecosystems	https://vme.ices.dk/download.aspx		April 2024
Habitats Directive	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A01992L0043-20130701	COUNCIL DIRECTIVE 92/43/EEC of 21 May 1992	April 2024
EU Red List habitats	https://op.europa.eu/en/publication-detail/-/publication/e9a7b255-c501-11e7-9b01-01aa75ed71a1/language-en	2016	April 2024

Table 3. Column names used for the look-up tables. Each column has a long name and short name. The short name is needed so that the table can be joined to a shapefile, which limits column names to 10 characters. 'Assessed habitat' refers to the habitat class that was assessed by European Commission et al. (2016), which was usually defined in the European nature information system (EUNIS) classification system v2007-11. The European Environment Agency (EEA) subsequently translated these habitats into EUNIS v2022 and Annex I of the Habitats Directive (Council Directive 92/43/EEC). In this piece of work, we have restructured the tables so that there is a single table per habitat classification system. MSFD = Marine Strategy Framework Directive (Directive 2008/56/EC)

Description	**Column long name**	**Column short name**	**Corresponding column name in EEA spreadsheet**
Habitat code in target classification system	Habitat code	HabCode	Red List habitat code
			EUNIS 2022 code
Name of habitat in target classification system	Habitat name	HabType	Red List habitat name
			EUNIS 2022 name
Target habitat classification system	Habitat classification system	HabClass	NA
Name of assessed habitat (if different)	Assessed habitat name	HabTypeAss	Red List habitat name
Habitat code of assessed habitat (if different)	Assessed habitat code	HabCodeAss	Red List habitat code
Relationship with assessed	Relationship between	HabRelation	EUNIS 2022 qualifier
Red List conservation status of the habitat within EU Members States of the stated MSFD region as shaded in Figure 1.	Conservation status within EU Member States (EU28)	StatusEU	Overall Category EU28
Red List conservation status of the habitat within all countries of the stated MSFD region as shaded in Figure 1.	Conservation status within EU and adjacent countries (EU28+)	StatusWide	Overall Category EU28+
Name of MSFD region in which the habitat was assessed	Region of assessment	Region	Region

Table 4. List of sources for invasive marine species

Source	URL	Version	Date of access	Notes
World Register of Introduced Species	https://www.marinespecies.org/introduced/	N/A	April 2024	Using full export provided by WoRMS to OBIS
European Invasive Alien Species (IAS) Regulation (Regulation (EU) No 1143/2014)	https://eur-lex.europa.eu/eli/reg/2014/1143/oj https://easin.jrc.ec.europa.eu/	N/A	April 2024	

Table 5. Number of assessed species per each phylum identified as Conservation Importance or Threatened.

Phylum	Conservation Importance	Threatened
Annelida	5	3
Arthropoda	13	59
Bryozoa	-	1
Charophyta	2	2
Chlorophyta	-	1
Chordata	126	1187
Cnidaria	1	271
Echinodermata	2	22
Foraminifera	1	-
Mollusca	10	232
Ochrophyta	1	17
Platyhelminthes	1	-
Porifera	3	12
Rhodophyta	2	16
Tracheophyta	8	24

Table 6. Conservation status of marine species in Europe. Species were classified as either threatened or of conservation importance. Documents or assessments used are the Bird Directive (BD), Habitat Directive (HD), Nature Restoration Law (NRL), Barcelona Convention (BC), Black Sea Commission (BSC), OSPAR list of threatened species (OSP), HELCOM Red List (HEL), different lists of fishes of prohibited exploitation (PR), the EU Red List (EU-RL) and the IUCN Global Red List (G-RL).

Phylum	Species	Document(s)
Conservation importance		
Annelida	*Eteone siphonodonta, Nainereis laevigata, Phyllodoce nana, Sabella pavonina, Sylvia sarda*	BSC, HEL, BD
Arthropoda	*Apseudopsis ostroumovi, Carcinus mediterraneus, Corophium multisetosum, Corystes cassivelaunus, Homarus vulgaris, Inachus dorsettensis, Iphigenella acanthopoda, Iphigenella andrussovi, Iphigenella shablensis, Katamysis warpachowskyi, Megabalanus azoricus, Pachygrapsus marmoratus, Processa pontica*	BSC, HEL, G-RL, OSP
Charophyta	*Chara horrida, Nitellopsis obtusa*	HEL
Chordata	*Alosa alosa, Amphioxus lanceolatum, Anas crecca, Anas platyrhynchos, Anser anser, Anser brachyrhynchus, Aspius aspius, Aythya nyroca, Balaena mysticetus, Balaenoptera edeni, Branta bernicla, Bulweria bulwerii, Burhinus oedicnemus, Calidris alba, Calidris alpina, Calidris canutus, Calidris minuta, Calonectris borealis, Catharacta skua, Cepphus grylle, Charadrius dubius, Charadrius hiaticula, Chlidonias hybrida, Chlidonias hybridus, Chlidonias leucopterus, Chlidonias niger, Coregonus albula, Coregonus lavaretus oxyrinchus, Cyclopterus lumpus, Delphinapterus leucas, Diplodus annularis, Dipturus nidarosiensis, Egretta garzetta, Erignathus barbatus, Etmopterus pusillus, Gavia arctica, Gavia immer, Gavia stellata, Gelochelidon nilotica, Globicephala macrorhynchus, Halichoerus grypus, Himantopus himantopus, Hydrocoloeus minutus, Hydrocoloeus minutus (wintering population), Hyperoodon ampullatus, Kogia breviceps, Lagenodelphis hosei, Lagenorhynchus acutus, Lagenorhynchus albirostris, Lampetra fluviatilis, Larus cachinnans, Larus canus, Larus fuscus, Larus genei, Larus glaucoides, Larus hyperboreus, Larus ichthyaetus, Larus michahellis, Larus minutus, Limosa lapponica, Liza ramada, Lophius piscatorius, Lota lota, Lutra lutra, Melanitta nigra, Mergus merganser, Mesogobius batrachocephalus, Mesoplodon bidens, Mesoplodon europaeus, Mesoplodon mirus, Mobula rochebrunei, Monodon monoceros, Morus bassanus, Mullus barbatus ponticus, Nerophis ophidion, Netta rufina, Numenius phaeopus, Oceanodroma castro, Oceanodroma leucorhoa, Pagellus bogaraveo, Pagophila eburnea, Pagophilus groenlandicus, Peponocephala electra, Phalacrocorax carbo, Phalaropus lobatus, Phenicopterus rubber, Phoca vitulina, Phoenicopterus roseus, Pluvialis apricaria, Pluvialis squatarola, Podiceps cristatus, Podiceps nigricollis, Porzana porzana, Pseudorca crassidens, Pterodroma feae, Puffinus assimilis, Puffinus baroli, Puffinus puffinus, Pusa hispida, Raja montagui, Recurvirostra avosetta, Scophthalmus maeoticus, Serranus scriba, Sphyraena sphyraena, Spicara smaris, Stenella frontalis, Stercorarius longicaudus, Sterna caspia, Sterna dougallii, Sterna hirundo, Sterna nilotica, Sterna paradisaea, Sternula albifrons, Sturnus roseus, Syngnatus tenuirostris, Syngnatus typhle, Tachybaptus ruficollis, Thalasseus sandvicensis, Thunnus thynnus, Trigla lucerna, Tringa cinerea, Tringa nebularia, Uria aalge, Uria lomvia, Xiphias gladius, Zoarces viviparus*	OSP, G-RL, BSC, BD, HEL, HD, EU-RL, NRL, PR
Cnidaria	*Corallium rubrum*	HD, PR
Echinodermata	*Echinocyamus pusillus, Marthasterias glacialis*	BSC
Foraminifera	*Coronella austriaca*	HD, G-RL
Mollusca	*Alderia modesta, Amauropsis islandica, Arctica islandica, Bela nebula, Boreotrophon truncatus, Cyclope donovani, Mya truncata, Nucella lapillus, Patella ferruginea, Patella ulyssiponensis aspera*	HEL, OSP, BSC, HD
Ochrophyta	*Dictyota dichotoma*	BSC
Platyhelminthes	*Hoplopterus spinosus*	BD
Porifera	*Halichondria panicea, Lissodendoryx variisclera, Suberites prototipus*	BSC
Rhodophyta	*Lithothamnium coralloides, Phymatolithon calcareum*	HD
Tracheophyta	*Carex distans, Carex extensa, Carex paleacea, Crassula aquatica, Posidonia australis, Spartina pectinata, Zostera asiatica, Zostera caulescens*	HD, G-RL, HEL
Threatened		
Annelida	*Hesionides arenarius, Mesonerilla prospera, Ophelia bicornis*	BSC, G-RL
Arthropoda	*Anomalocera patersoni, Antrisocopia prehensilis, Arubolana imula, Atelecyclus rotundatus, Atlantasellus cavernicolus, Barbouria cubensis, Bermudalana aruboides, Bermudamysis speluncola, Biancolina cuniculus, Callianassa pontica, Callianassa truncata, Cocoharpinia iliffei, Curassanthura bermudensis, Deshayesorchestia deshayesii, Erebonectes nesioticus, Eriphia verrucosa, Halacarellus procerus, Halobrecta princeps, Haploops tenuis, Haploops tubicola, Hemimysis anomala, Hemimysis serrata, Hippolyte varians, Idunella sketi, Labidocera brunescens, Leptocaris stromatolicolus, Limulus polyphemus, Macropipus arcuatus, Mexilana saluposi, Micronaspis floridana, Mictocaris halope, Nanocopia minuta, Ocypode cursor, Orthetrum poecilops, Pachylasma giganteum, Palinurus elephas, Paracyclopia naessi, Parapinnixa affinis, Pilumnus hirtellus, Platyops sterreri, Pontella mediterranea, Ponticyclops boscoi, Procaris chacei, Pseudoniphargus grandimanus, Somersiella sterreri, Spelaeoecia bermudensis, Speleoithona bermudensis, Speleophria bivexilla, Speleophria scottodicarloi, Sphaerolana affinis, Sphaerolana interstitialis, Tachypleus tridentatus, Typhlatya consobrina, Typhlatya iliffei, Typhlatya taina, Typhlocaris ayyaloni, Typhlocaris salentina, Upogebia pusilla, Xantho poressa*	BSC, G-RL, HEL, BC
Bryozoa	*Hornera lichenoides*	BC
Charophyta	*Lamprothamnium papulosum, Nitella hyalina*	HEL
Chlorophyta	*Caulerpa ollivieri*	BC
Chordata	*Acanthemblemaria atrata, Acanthemblemaria castroi, Acanthemblemaria mangognatha, Acanthemblemaria stephensi, Acanthobrama centisquama, Acanthogobius insularis, Acanthopagrus sivicolus, Acanthopagrus vagus, Acanthurus chronixis, Acentrogobius griseus, Acheilognathus*	G-RL, BSC, HD, BC, PR, HEL, OSP, EU-RL, NRL, BD

	melanogaster, Achoerodus gouldii, Acipenser baerii, Acipenser brevirostrum, Acipenser fulvescens, Acipenser gueldenstaedtii, Acipenser medirostris, Acipenser mikadoi, Acipenser naccarii, Acipenser nudiventris, Acipenser oxyrinchus, Acipenser persicus, Acipenser ruthenus, Acipenser schrenckii, Acipenser sinensis, Acipenser stellatus, Acipenser sturio, Acipenser transmontanus, Acroteriobatus annulatus, Acroteriobatus leucospilus, Acroteriobatus variegatus, Aetobatus flagellum, Aetobatus laticeps, Aetobatus narinari, Aetobatus narutobiei, Aetobatus ocellatus, Aetomylaeus bovinus, Aetomylaeus maculatus, Aetomylaeus milvus, Aetomylaeus nichofii, Aetomylaeus vespertilio, Aidablennius sphinx, Aioliops brachypterus, Aipysurus fuscus, Albula glossodonta, Alburnus mentoides, Alburnus nasreddini, Alburnus orontis, Alburnus sarmaticus, Allotoca diazi, Alopias pelagicus, Alopias superciliosus, Alopias vulpinus, Alosa aestivalis, Alosa algeriensis, Alosa immaculata, Alosa volgensis, Altrichthys azurelineatus, Altrichthys curatus, Amblycirrhitus earnshawi, Amblyeleotris neglecta, Amblyglyphidodon batunai, Amblyglyphidodon ternatensis, Amblyraja frerichsi, Amblyraja radiata, Amblyrhynchus cristatus, Amphiprion mccullochi, Anablepsoides luitalimae, Anarhichas denticulatus, Anarhichas lupus, Anarhynchus frontalis, Anas eatoni, Anas nesiotis, Anchoa choerostoma, Anguilla anguilla, Anguilla dieffenbachii, Anguilla japonica, Anguilla luzonensis, Anguilla rostrata, Anoxypristis cuspidata, Anser erythropus, Anser fabalis, Aphaniops richardsoni, Aphaniops sirhani, Aphanius almiriensis, Aphanius fasciatus, Aphanius iberus, Aphia minuta, Apistogramma psammophila, Apletodon barbatus, Aplocheilus dayi, Aplochiton marinus, Apricaphanius iberus, Aptychotrema timorensis, Arcos poecilophthalmos, Arctocephalus galapagoensis, Ardenna creatopus, Ardeola idae, Arenaria interpres, Argyrosomus inodorus, Argyrosomus japonicus, Argyrosomus thorpei, Arothron inconditus, Astyanax anai, Atherinella venezuelae, Atherinomorus lineatus, Atlantoraja castelnaui, Atlantoraja cyclophora, Atlantoraja platana, Atractosteus tristoechus, Awaous commersoni, Axoclinus cocoensis, Axoclinus multicinctus, Axoclinus rubinoffi, Aythya marila, Azurina eupalama, Bagarius bagarius, Bahaba taipingensis, Balaenoptera acutorostrata, Balaenoptera borealis, Balaenoptera musculus, Balaenoptera physalus, Balaenoptera ricei, Balistes capriscus, Balistes carolinensis, Balistes punctatus, Barbodes cataractae, Barbus tauricus, Bathygobius burtoni, Bathygobius lineatus, Bathyraja albomaculata, Bathyraja griseocauda, Bathyraja irrasa, Bathytoshia centroura, Bathytoshia lata, Batrachoides boulengeri, Belone belone euxini, Benthobatis kreffti, Benthobatis yangi, Beringraja pulchra, Betta omega, Bodianus scrofa, Bolbometopon muricatum, Brachaelurus colcloughi, Brachionichthys hirsutus, Brachiopsilus dianthus, Brachiopsilus ziebelli, Brachygenys jessiae, Brachyramphus marmoratus, Branta ruficollis, Brevitrygon heterura, Brevitrygon imbricata, Brevitrygon javaensis, Bythaelurus canescens, Calidris acuminata, Calidris falcinellus, Calidris ferruginea, Calidris maritima, Calidris temminckii, Calidris tenuirostris, Callionymus belenus, Callionymus comptus, Callionymus sanctaehelenae, Callogobius amikami, Callorhinchus callorynchus, Callorhinus ursinus, Calonectris diomedea, Canthigaster cyanetron, Canthigaster marquesensis, Canthigaster rapaensis, Canthigaster sanctaehelenae, Carcharhinus acronotus, Carcharhinus albimarginatus, Carcharhinus amblyrhynchoides, Carcharhinus amblyrhynchos, Carcharhinus amboinensis, Carcharhinus borneensis, Carcharhinus brachyurus, Carcharhinus brevipinna, Carcharhinus cerdale, Carcharhinus dussumieri, Carcharhinus falciformis, Carcharhinus hemiodon, Carcharhinus leiodon, Carcharhinus leucas, Carcharhinus limbatus, Carcharhinus longimanus, Carcharhinus melanopterus, Carcharhinus obscurus, Carcharhinus obsoletus, Carcharhinus perezi, Carcharhinus plumbeus, Carcharhinus porosus, Carcharhinus sealei, Carcharhinus signatus, Carcharhinus tjutjot, Carcharias taurus, Carcharodon carcharias, Caretta caretta, Centrophorus atromarginatus, Centrophorus granulosus, Centrophorus harrissoni, Centrophorus isodon, Centrophorus lesliei, Centrophorus longipinnis, Centrophorus lusitanicus, Centrophorus moluccensis, Centrophorus squamosus, Centrophorus tessellatus, Centrophorus uyato, Centroscyllium granulatum, Centroscymnus coelolepis, Centroscymnus owstonii, Cephalocassis manillensis, Cephalorhynchus hectori, Cephaloscyllium albipinnum, Cephaloscyllium fasciatum, Cephaloscyllium sarawakensis, Cephaloscyllium silasi, Cepphus grylle grylle/Cepphus grylle arcticus, Cetorhinus maximus, Chaenogaleus macrostoma, Chaenopsis schmitti, Chaetodontoplus vanderloosi, Champsocephalus esox, Channa orientalis, Charadrius alexandrinus, Charadrius leschenaultii, Charadrius obscurus, Charadrius thoracicus, Cheilinus undulatus, Cheimarrichthys fosteri, Cheimerius matsubarai, Chelonia mydas, Chelonodontops pleurospilus, Chiloscyllium burmensis, Chiloscyllium griseum, Chiloscyllium hasselti, Chiloscyllium indicum, Chimaera monstrosa, Chimaera phantasma, Chirostoma mezquital, Chlidonias albostriatus, Chriolepis dialepta, Chriolepis lepidota, Chrysiptera arnazae, Chrysiptera hemicyanea, Chrysiptera niger, Chrysoblephus cristiceps, Chrysoblephus gibbiceps, Cirrhinus cirrhosus, Cirrhoscyllium formosanum, Clangula hyemalis, Clangula hyemalis (wintering population), Clidoderma asperrimum, Clinus latipennis, Clinus spatulatus, Clupea manulensis, Clupeonella engrauliformis, Clupeonella grimmi, Clupeonella muhlisi, Cobitis phrygica, Coilia mystus, Coilia nasus, Colpichthys hubbsi, Conniella apterygia, Corcyrogobius lubbocki, Coregonus huntsmani, Coregonus lavaretus, Coregonus maraena, Coris bulbifrons, Coryogalops ocheticus, Coryphaenoides rupestris, Coryphopterus alloides, Coryphopterus eidolon, Coryphopterus hyalinus, Coryphopterus lipernes, Coryphopterus personatus, Coryphopterus thrix, Coryphopterus tortugae, Coryphopterus venezuelae, Cosmocampus balli, Crocodylus acutus, Ctenogobius claytonii, Cursorius cursor, Cymatoceps nasutus, Cynoglossus macrostomus, Cynoscion acoupa, Cynoscion othonopterus, Cynoscion regalis, Cyprinodon bobmilleri, Cyprinodon bondi, Cyprinodon laciniatus, Cyprinodon salinus, Cyprinodon tularosa, Cyprinus carpio, Cystophora cristata, Dactyloscopus insulatus, Dactyloscopus lacteus, Daector reticulata, Daector schmitti, Dalatias licha, Dasyatis centroura, Dasyatis hypostigma, Dasyatis pastinaca, Deania calcea, Deania quadrispinosa, Delphinus delphis, Dentex dentex, Dentiraja confusa, Dermochelys coriacea, Dermogenys orientalis, Dialommus fuscus, Dicentrarchus labrax, Didogobius amicuscaridis, Diomedea amsterdamensis, Diomedea antipodensis, Diomedea dabbenena, Diomedea epomophora, Diomedea exulans, Diomedea sanfordi, Diplobatis colombiensis, Diplobatis guamachensis, Diplobatis picta, Dipturus batis, Dipturus brevicaudatus, Dipturus canutus, Dipturus chilensis, Dipturus chinensis, Dipturus crosnieri, Dipturus intermedius, Dipturus leptocaudus, Dipturus maugeanus, Dipturus mennii, Dipturus trachydermus, Dipulus norfolkanus, Drombus dentifer, Dugong dugon, Echinorhinus brucus, Ecsenius kurti, Ecsenius randalli, Ecsenius tigris, Ecsenius tricolor, Egretta eulophotes, Elacatinus atronasus, Elacatinus cayman, Elacatinus centralis, Elacatinus figaro, Elacatinus jarocho, Elacatinus prochilos, Eleotrica cableae, Emblemariopsis pricei, Enhydra lutris, Enneanectes smithi, Enneapterygius namarrgon, Entomacrodus chapmani, Entomacrodus solus, Eopsetta grigorjewi, Epinephelus akaara, Epinephelus bruneus, Epinephelus fuscoguttatus, Epinephelus itajara, Epinephelus marginatus, Epinephelus morio, Epinephelus polyphekadion, Epinephelus striatus, Eptatretus cheni, Eptatretus fernholmi, Eptatretus longipinnis, Eptatretus nelsoni, Eptatretus octatrema, Eptatretus taiwanae,	

	Eretmochelys imbricata, Etmopterus spinax, Eubalaena glacialis, Eubalaena japonica, Eudyptes chrysocome, Eudyptes chrysolophus, Eudyptes moseleyi, Eudyptes robustus, Eudyptes sclateri, Eusphyra blochii, Eviota aquila, Eviota ocellifer, Eviota pamae, Eviota raja, Evynnis cardinalis, Fluvitrygon oxyrhynchus, Fluvitrygon signifer, Fontitrygon colarensis, Fontitrygon geijskesi, Fontitrygon margarita, Fontitrygon ukpam, Fratercula arctica, Fregata andrewsi, Fregata aquila, Fregetta maoriana, Fulmarus glacialis, Fundulus jenkinsi, Gadus morhua, Galaxias argenteus, Galaxias postvectis, Galaxiella toourtkoourt, Galeorhinus galeus, Galeus mincaronei, Galeus polli, Gallinago media, Gambusia heterochir, Gambusia xanthosoma, Gavia arctica (wintering population), Gavia stellata (wintering population), Gillellus chathamensis, Gillichthys seta, Ginglymostoma cirratum, Ginglymostoma unami, Girella zonata, Glareola nordmanni, Glareola pratincola, Glaucostegus cemiculus, Glaucostegus granulatus, Glaucostegus halavi, Glaucostegus obtusus, Glaucostegus thouin, Glaucostegus typus, Glaucostegus younholeei, Globicephala melas, Glossogobius minutus, Glyphis gangeticus, Glyphis garricki, Glyphis glyphis, Glyptocephalus cynoglossus, Gobiesox aethus, Gobiesox canidens, Gobiesox woodsi, Gobioclinus dendriticus, Gobiodon aoyagii, Gobiodon axillaris, Gobiodon erythrospilus, Gobiodon fulvus, Gobiodon reticulatus, Gobiomorphus hubbsi, Gobiosoma hildebrandi, Gobiosoma homochroma, Gobiosoma spilotum, Gobius tetrophthalmus, Gobulus birdsongi, Gorogobius stevcici, Grampus griseus, Gurgesiella dorsalifera, Gymnura altavela, Gymnura japonica, Gymnura poecilura, Gymnura sereti, Gymnura tentaculata, Gymnura zonura, Haematopus chathamensis, Haematopus ostralegus, Halaelurus boesemani, Halaelurus buergeri, Halaelurus natalensis, Haliaeetus albicilla, Haliaeetus leucoryphus, Halichoeres adustus, Halichoeres burekae, Halichoeres discolor, Halichoeres insularis, Halichoeres malpelo, Halichoeres salmofasciatus, Halichoeres socialis, Haploblepharus edwardsii, Haploblepharus fuscus, Haploblepharus kistnasamyi, Hemigaleus microstoma, Hemipristis elongata, Hemiscyllium galei, Hemiscyllium hallstromi, Hemiscyllium henryi, Hemiscyllium michaeli, Hemiscyllium strahani, Hemitriakis complicofasciata, Hemitriakis indroyonoi, Hemitriakis japanica, Hemitriakis leucoperiptera, Hemitrygon bennetti, Hemitrygon izuensis, Hemitrygon laevigata, Hemitrygon navarrae, Hemitrygon sinensis, Himantura leoparda, Himantura uarnak, Himantura undulata, Hippocampus algiricus, Hippocampus barbouri, Hippocampus capensis, Hippocampus comes, Hippocampus erectus, Hippocampus guttulatus, Hippocampus guttulatus microstephanus, Hippocampus hippocampus, Hippocampus histrix, Hippocampus ingens, Hippocampus kelloggi, Hippocampus kuda, Hippocampus mohnikei, Hippocampus patagonicus, Hippocampus spinosissimus, Hippocampus trimaculatus, Hippocampus whitei, Hippoglossoides platessoides, Hippoglossus hippoglossus, Holacanthus clarionensis, Holohalaelurus favus, Holohalaelurus punctatus, Hongeo koreana, Hoplostethus atlanticus, Horabagrus brachysoma, Horadandia atukorali, Hucho taimen, Huso dauricus, Huso huso, Hydrobates cheimomnestes, Hydrobates pelagicus, Hydrobates socorroensis, Hydrolagus matallanasi, Hydroprogne caspia, Hypanus berthalutzae, Hypanus dipterurus, Hypanus longus, Hypanus marianae, Hypanus rudis, Hyphessobrycon bussingi, Hypomesus transpacificus, Hypoplectrus castroaguirrei, Hypoplectrus liberte, Hypoplectrus maya, Hyporhamphus xanthopterus, Hyporthodus acanthistius, Hyporthodus flavolimbatus, Hyporthodus niveatus, Hypsoblennius proteus, Isogomphodon oxyrhynchus, Istiophorus platypterus, Isurus oxyrinchus, Isurus paucus, Knipowitschia cameliae, Knipowitschia longicaudata, Knipowitschia mermere, Kogia sima, Kuhlia sauvagii, Labrisomus jenkinsi, Labrisomus socorroensis, Labrus viridis, Lachnolaimus maximus, Lamiopsis temminckii, Lamiopsis tephrodes, Lamna nasus, Lampetra lanceolata, Larimichthys crocea, Larus argentatus, Larus armenicus, Larus audouinii, Larus fuliginosus, Larus fuscus fuscus, Larus marinus, Larus melanocephalus, Larus relictus, Larus ridibundus, Laterallus jamaicensis, Lates japonicus, Latimeria chalumnae, Latimeria menadoensis, Lepidochelys kempii, Lepidochelys olivacea, Lepidonectes bimaculatus, Lepidonectes corallicola, Leptocharias smithii, Lethrinus mahsena, Leucocarbo carunculatus, Leucocarbo chalconotus, Leucoraja circularis, Leucoraja fullonica, Leucoraja melitensis, Leucoraja ocellata, Leucoraja wallacei, Limbochromis robertsi, Limia islai, Limia mandibularis, Limia rivasi, Lipophrys pavo, Lithognathus lithognathus, Liza luciae, Lontra felina, Lontra provocax, Lopholatilus chamaeleonticeps, Lucifuga gibarensis, Lucifuga lucayana, Lucifuga simile, Lucifuga spelaeotes, Luciobarbus brachycephalus, Luciobarbus capito, Luciogobius albus, Lupinoblennius paivai, Lutjanus campechanus, Lutjanus cyanopterus, Lutra sumatrana, Lythrypnus gilberti, Lythrypnus insularis, Maculabatis arabica, Maculabatis bineeshi, Maculabatis gerrardi, Maculabatis macrura, Maculabatis pastinacoides, Makaira nigricans, Malaclemys terrapin, Malacoctenus zonogaster, Malacoraja senta, Medusablennius chani, Megadyptes antipodes, Megalops atlanticus, Megaptera novaeangliae, Meiacanthus abruptus, Meiacanthus naevius, Melanitta fusca, Melanitta fusca (breeging/wintering), Melanitta nigra (wintering population), Melanogrammus aeglefinus, Melanotaenia bowmani, Melanotaenia grunwaldi, Melanotaenia klasioensis, Melanotaenia lacunosa, Melanotaenia longispina, Melanotaenia mamahensis, Melanotaenia manibuii, Melanotaenia naramasae, Melanotaenia sembrae, Melanotaenia sikuensis, Melanotaenia susii, Melanotaenia wilsoni, Menidia conchorum, Mergus serrator, Mergus serrator (wintering population), Merluccius senegalensis, Mesoplodon densirostris, Mesoplodon perrini, Milyeringa veritas, Mimoblennius lineathorax, Mobula alfredi, Mobula birostris, Mobula eregoodoo, Mobula hypostoma, Mobula kuhlii, Mobula mobular, Mobula munkiana, Mobula tarapacana, Mobula thurstoni, Mola mola, Molva dypterygia, Monachus monachus, Morus capensis, Mustelus andamanensis, Mustelus dorsalis, Mustelus fasciatus, Mustelus griseus, Mustelus higmani, Mustelus manazo, Mustelus mento, Mustelus minicanis, Mustelus mustelus, Mustelus punctulatus, Mustelus schmitti, Mustelus whitneyi, Mustelus widodoi, Mycteroperca fusca, Mycteroperca interstitialis, Mycteroperca jordani, Mycteroperca microlepis, Mycteroperca olfax, Myliobatis aquila, Myliobatis chilensis, Myliobatis freminvillei, Myliobatis goodei, Myliobatis longirostris, Myliobatis peruvianus, Myliobatis ridens, Myliobatis tobijei, Myripristis clarionensis, Myripristis gildi, Myxine garmani, Myxine paucidens, Myxine sotoi, Myxodagnus sagitta, Myzopsetta ferruginea, Nannoperca obscura, Nannoperca pygmaea, Narcine atzi, Narcine brevilabiata, Narcine entemedor, Narcine leoparda, Narcine lingula, Narcine maculata, Narcine prodorsalis, Narcine timlei, Narke dipterygia, Narke japonica, Nasolamia velox, Nebrius ferrugineus, Negaprion acutidens, Negaprion brevirostris, Nemipterus virgatus, Neomonachus schauinslandi, Neoopisthopterus cubanus, Neophoca cinerea, Neophocaena asiaeorientalis, Neophocaena phocaenoides, Neopomacentrus aquadulcis, Neosalanx reganius, Neostethus ctenophorus, Neostethus geminus, Neostethus robertsi, Neostethus thessa, Nesofregetta fuliginosa, Ninnigobius canestrinii, Notarius bonillai, Notarius cookei, Notarius neogranatensis, Notorynchus cepedianus, Numenius arquata, Numenius borealis, Numenius madagascariensis, Numenius tenuirostris, Odobenus rosmarus, Odontaspis ferox, Odontoscion eurymesops, Ogilbia cocoensis, Ogilbia galapagosensis, Ogilbichthys ferocis, Okamejei acutispina, Okamejei boesemani, Okamejei cairae, Okamejei hollandi, Okamejei kenojei, Okamejei meerdervoortii, Okamejei schmidti, Oman ypsilon, Omobranchus	

	aurosplendidus, Omobranchus hikkaduwensis, Omobranchus mekranensis, Omobranchus smithi, Onychoprion aleuticus, Onychoprion fuscatus, Ophioblennius clippertonensis, Ophisternon afrum, Ophisternon candidum, Opisthonema berlangai, Orcaella brevirostris, Orcaella heinsohni, Orcinus orca, Orcynopsis unicolor, Oreochromis amphimelas, Oreochromis andersonii, Oreochromis lepidurus, Oreochromis mossambicus, Oxymonacanthus halli, Oxymonacanthus longirostris, Oxynotus centrina, Oxynotus japonicus, Oxynotus paradoxus, Oxyura maccoa, Pachyptila macgillivrayi, Pandion haliaetus, Pangasius krempfi, Papasula abbotti, Parablennius lodosus, Parablennius serratolineatus, Paraclinus fehlmanni, Paraclinus magdalenae, Paraclinus walkeri, Paradiancistrus cuyoensis, Paragaleus leucolomatus, Paragaleus pectoralis, Paragaleus randalli, Paragaleus tengi, Parahucho perryi, Paralabrax albomaculatus, Paraletharchus opercularis, Paralichthys patagonicus, Parmaturus angelae, Pastinachus ater, Pastinachus gracilicaudus, Pastinachus solocirostris, Pastinachus stellurostris, Pateobatis bleekeri, Pateobatis fai, Pateobatis jenkinsii, Pateobatis uarnacoides, Pelacanus onocrotalus, Pelagodroma marina, Pelecanus crispus, Pelecanus onocrotalus, Pelonaia corrugata, Pentanemus quinquarius, Petromyzon marinus, Petrus rupestris, Pezichthys amplispinus, Pezichthys compressus, Phalacrocorax aristotelis, Phalacrocorax capensis, Phalacrocorax featherstoni, Phalacrocorax neglectus, Phalacrocorax nigrogularis, Phalacrocorax pygmeus, Philomachus pugnax, Phoca vitulina vitulina, Phocarctos hookeri, Phocoena phocoena, Phocoena sinus, Phoebastria albatrus, Phoebastria irrorata, Phoebetria fusca, Phoenicopterus ruber, Physeter macrocephalus, Platalea leucorodia, Platichthys bicoloratus, Platygillellus rubellulus, Platyrhina hyugaensis, Platyrhina sinensis, Platyrhina tangi, Plectranthias chungchowensis, Plectropomus areolatus, Plectropomus marisrubri, Plegadis falcinellus, Podiceps auritus, Podiceps auritus (breeding/wintering), Podiceps gallardoi, Podiceps grisegena, Podiceps grisegena (wintering population), Podocnemis unifilis, Poecilia velifera, Poeciliopsis jackschultzi, Pogonias courbina, Polysteganus praeorbitalis, Polysteganus undulosus, Polysticta stelleri, Polysticta stelleri (wintering population), Pomatomus saltator, Pomatomus saltatrix, Pomatoschistus caucasicus, Pomatoschistus tortonesei, Pontoporia blainvillei, Poropuntius chonglingchungi, Praealticus natalis, Priolepis ascensionis, Prionotus miles, Prionotus teaguei, Pristis clavata, Pristis pectinata, Pristis pristis, Pristis zijsron, Probarbus jullieni, Procellaria aequinoctialis, Procellaria conspicillata, Procellaria parkinsoni, Procellaria westlandica, Proscyllium habereri, Proterorhinus tataricus, Protogobius attiti, Prototroctes maraena, Pseudobatos buthi, Pseudobatos glaucostigmus, Pseudobatos horkelii, Pseudobatos lentiginosus, Pseudobatos leucorhynchus, Pseudobatos percellens, Pseudobatos planiceps, Pseudobatos prahli, Pseudobulweria aterrima, Pseudobulweria becki, Pseudobulweria macgillivrayi, Pseudocaranx chilensis, Pseudoginglymostoma brevicaudatum, Pseudohemiculter dispar, Pseudomugil mellis, Pseudophoxinus anatolicus, Pseudophoxinus antalyae, Pseudopleuronectes americanus, Pseudoscaphirhynchus fedtschenkoi, Pseudoscaphirhynchus hermanni, Pseudoscaphirhynchus kaufmanni, Pseudosphromenus dayi, Pseudotolithus senegalensis, Pseudotolithus senegallus, Pseudupeneus prayensis, Psilotris boehlkei, Pterapogon kauderni, Pterodroma alba, Pterodroma arminjoniana, Pterodroma atrata, Pterodroma axillaris, Pterodroma baraui, Pterodroma brevipes, Pterodroma cahow, Pterodroma caribbaea, Pterodroma cervicalis, Pterodroma cookii, Pterodroma defilippiana, Pterodroma deserta, Pterodroma externa, Pterodroma hasitata, Pterodroma incerta, Pterodroma leucoptera, Pterodroma longirostris, Pterodroma madeira, Pterodroma magentae, Pterodroma phaeopygia, Pterodroma pycrofti, Pterodroma sandwichensis, Pteromylaeus bovinus, Ptychochromis inornatus, Ptychochromis oligacanthus, Puffinus auricularis, Puffinus heinrothi, Puffinus huttoni, Puffinus lherminieri, Puffinus mauretanicus, Puffinus newelli, Puffinus puffinus yelkouan, Puffinus yelkouan, Pungitius sinensis, Pusa caspica, Quassiremus evionthas, Raja clavata, Raja maderensis, Raja ocellifera, Raja radula, Raja undulata, Redigobius dispar, Rhabdosargus globiceps, Rhina ancylostoma, Rhincodon typus, Rhinobatos albomaculatus, Rhinobatos annandalei, Rhinobatos borneensis, Rhinobatos hynnicephalus, Rhinobatos irvinei, Rhinobatos jimbaranensis, Rhinobatos lionotus, Rhinobatos penggali, Rhinobatos ranongensis, Rhinobatos rhinobatos, Rhinobatos schlegelii, Rhinobatos whitei, Rhinoptera bonasus, Rhinoptera brasiliensis, Rhinoptera javanica, Rhinoptera jayakari, Rhinoptera marginata, Rhizoprionodon acutus, Rhizoprionodon lalandii, Rhizoprionodon longurio, Rhizoprionodon porosus, Rhomboplites aurorubens, Rhynchobatus australiae, Rhynchobatus cooki, Rhynchobatus djiddensis, Rhynchobatus immaculatus, Rhynchobatus laevis, Rhynchobatus luebberti, Rhynchobatus springeri, Rhynchorhina mauritaniensis, Rioraja agassizii, Rissa brevirostris, Rissa tridactyla, Rissa tridactyla (breeding/wintering), Rostroraja alba, Rostroraja equatorialis, Rostroraja velezi, Rynchops albicollis, Rypticus courtenayi, Salmo abanticus, Salmo salar, Salmo trutta, Salmo trutta labrax, Salvelinus confluentus, Sanopus astrifer, Sanopus greenfieldorum, Sanopus reticulatus, Sanopus splendidus, Sarda sarda, Sardinella maderensis, Scaphirhynchus suttkusi, Scartella nuchifilis, Scartella poiti, Scartella springeri, Scarus trispinosus, Schismatogobius insignus, Schistura scripta, Schroederichthys saurisqualus, Sciades parkeri, Sciaena callaensis, Scomber scombrus, Scomberomorus concolor, Scophthalmus maximus, Scorpaena ascensionis, Scorpaena mellissii, Scyliorhinus stellaris, Scylliogaleus quecketti, Scymnodon ichiharai, Scymnodon plunketi, Scymnodon ringens, Sebastes fasciatus, Sebastes mentella, Sebastes norvegicus, Sebastes paucispinis, Sebastolobus alascanus, Semicossyphus pulcher, Serranus cabrilla, Serranus socorroensis, Sicyopterus eudentatus, Sicyopterus rapa, Sicyopus beremeensis, Sicyopus jonklaasi, Siganus niger, Silhouettea sibayi, Sillago parvisquamis, Somateria mollissima, Somateria mollissima (breeding/wintering), Somniosus microcephalus, Sousa chinensis, Sousa plumbea, Sousa sahulensis, Sousa teuszii, Spheniscus demersus, Spheniscus humboldti, Spheniscus mendiculus, Sphyrna corona, Sphyrna lewini, Sphyrna media, Sphyrna mokarran, Sphyrna tiburo, Sphyrna tudes, Sphyrna zygaena, Spiniraja whitleyi, Springeratus polyporatus, Squalus acanthias, Squalus brevirostris, Squalus chloroculus, Squalus formosus, Squalus hemipinnis, Squalus japonicus, Squalus mitsukurii, Squalus montalbani, Squatina aculeata, Squatina albipunctata, Squatina argentina, Squatina armata, Squatina formosa, Squatina guggenheim, Squatina japonica, Squatina legnota, Squatina nebulosa, Squatina occulta, Squatina oculata, Squatina squatina, Squatina tergocellatoides, Starksia galapagensis, Stegastes beebei, Stegastes leucorus, Stegastes redemptus, Stegostoma tigrinum, Stenella coeruleoalba, Steno bredanensis, Stenogobius kyphosus, Stercorarius parasiticus, Stereolepis gigas, Sterna acuticauda, Sterna albifrons, Sterna aurantia, Sterna sandvicensis, Sternula lorata, Sternula nereis, Stiphodon imperiorientis, Styracura pacifica, Styracura schmardae, Sympterichthys moultoni, Sympterygia acuta, Syngnathus watermeyeri, Synthliboramphus craveri, Synthliboramphus hypoleucus, Synthliboramphus scrippsi, Synthliboramphus wumizusume, Tachyeres leucocephalus, Tadorna ferruginea, Taeniurops meyeni, Takifugu chinensis, Takifugu plagiocellatus, Tautoga onitis, Telatrygon acutirostra, Telatrygon biasa, Telatrygon crozieri, Telatrygon zugei, Temera hardwickii, Tenualosa toli, Tetraodon pustulatus, Tetronarce puelcha,	

	Thalassarche carteri, Thalassarche chlororhynchos, Thalassarche chrysostoma, Thalassarche eremita, Thalassarche impavida, Thalassarche salvini, Thalasseus bernsteini, Thalassoma robertsoni, Thalassoma virens, Thalassophryne uranoscopus, Thinornis cucullatus, Thinornis novaeseelandiae, Thunnus maccoyii, Thunnus obesus, Thymallus aeliani, Thymallus thymallus, Thymichthys politus, Tigrigobius harveyi, Tigrigobius nesiotes, Tigrigobius redimiculus, Tomicodon absitus, Tomicodon abuelorum, Tomicodon bidens, Tomicodon vermiculatus, Torpedo adenensis, Torpedo bauchotae, Torpedo mackayana, Torpedo marmorata, Torpedo panthera, Torpedo suessii, Torpedo torpedo, Totoaba macdonaldi, Trachurus indicus, Trachurus trachurus, Triaenodon obesus, Triakis acutipinna, Triakis maculata, Triakis scyllium, Trichechus inunguis, Trichechus manatus, Trichechus senegalensis, Tringa erythropus, Tringa guttifer, Tringa stagnatilis, Tringa totanus, Trionyx triunguis, Tursiops truncatus, Umbrina cirrosa, Umbrina galapagorum, Upeneus saiab, Uria aalge ibericus, Urobatis tumbesensis, Urogymnus asperrimus, Urogymnus granulatus, Urogymnus lobistoma, Urogymnus polylepis, Urolophus aurantiacus, Urolophus bucculentus, Urolophus javanicus, Urolophus orarius, Urolophus sufflavus, Urolophus viridis, Urotrygon microphthalmum, Urotrygon reticulata, Urotrygon simulatrix, Urotrygon venezuelae, Ursus maritimus, Vanellus gregarius, Vanellus spinosus, Verasper moseri, Verasper variegatus, Vladichthys gloverensis, Wallago attu, Xenichthys agassizii, Xenus cinereus, Xyrichtys victori, Xyrichtys wellingtoni, Zalophus wollebaeki, Zanobatus schoenleinii, Zapteryx brevirostris, Zapteryx xyster, Zebrias lucapensis, Ziphius cavirostris	
Cnidaria	*Acanthastrea brevis, Acanthastrea hemprichii, Acropora abrolhosensis, Acropora aculeus, Acropora acuminata, Acropora anthocercis, Acropora aspera, Acropora awi, Acropora batunai, Acropora caroliniana, Acropora cervicornis, Acropora dendrum, Acropora derawanensis, Acropora desalwii, Acropora donei, Acropora echinata, Acropora elegans, Acropora globiceps, Acropora hemprichii, Acropora hoeksemai, Acropora horrida, Acropora indonesia, Acropora jacquelineae, Acropora kimbeensis, Acropora kirstyae, Acropora kosurini, Acropora listeri, Acropora loisetteae, Acropora lokani, Acropora lovelli, Acropora microclados, Acropora multiacuta, Acropora palmata, Acropora palmerae, Acropora paniculata, Acropora papillare, Acropora pharaonis, Acropora plumosa, Acropora polystoma, Acropora retusa, Acropora roseni, Acropora rudis, Acropora russelli, Acropora simplex, Acropora solitaryensis, Acropora speciosa, Acropora spicifera, Acropora striata, Acropora suharsonoi, Acropora tenella, Acropora turaki, Acropora vaughani, Acropora verweyi, Acropora walindii, Acropora willisae, Agaricia agaricites, Agaricia humilis, Agaricia lamarcki, Agaricia tenuifolia, Alveopora allingi, Alveopora daedalea, Alveopora excelsa, Alveopora fenestrata, Alveopora gigas, Alveopora japonica, Alveopora marionensis, Alveopora minuta, Alveopora verrilliana, Anacropora matthaii, Anacropora puertogalerae, Anacropora reticulata, Anacropora spinosa, Anomastraea irregularis, Astraeosmilia connata, Astraeosmilia curvata, Astreopora cucullata, Astreopora incrustans, Astreopora moretonensis, Astroides calycularis, Australogyra zelli, Balanophyllia europaea, Cantharellus noumeae, Catalaphyllia jardinei, Caulastraea echinulata, Cladocora caespitosa, Colpophyllia breviserialis, Colpophyllia natans, Coscinaraea hahazimaensis, Crassophyllum thessalonicae, Ctenella chagius, Cycloseris curvata, Cyphastrea agassizi, Cyphastrea hexasepta, Cyphastrea ocellina, Dendrogyra cylindrus, Dichocoenia stokesii, Diploria labyrinthiformis, Dipsastraea faviaformis, Dipsastraea laddi, Dipsastraea rosaria, Duncanopsammia peltata, Echinophyllia costata, Echinopora ashmorensis, Echinopora robusta, Edwardsia ivelli, Errina aspera, Eunicella verrucosa, Euphyllia cristata, Euphyllia paraglabrescens, Eusmilia fastigiata, Favites spinosa, Fimbriaphyllia ancora, Fimbriaphyllia paraancora, Fimbriaphyllia paradivisa, Galaxea acrhelia, Galaxea astreata, Galaxea cryptoramosa, Gerardia savaglia, Goniastrea ramosa, Goniopora albiconus, Goniopora burgosi, Goniopora cellulosa, Goniopora paliformis, Goniopora planulata, Goniopora polyformis, Halomitra clavator, Heliofungia actiniformis, Heliopora coerulea, Helioseris cucullata, Homophyllia bowerbanki, Horastrea indica, Hydnophora bonsai, Isopora brueggemanni, Isopora crateriformis, Isopora cuneata, Isopora togianensis, Leptastrea aequalis, Leptoria irregularis, Leptoseris incrustans, Leptoseris yabei, Lithophyllon ranjithi, Lobophyllia dentata, Lobophyllia diminuta, Lobophyllia flabelliformis, Lobophyllia hassi, Lobophyllia ishigakiensis, Lobophyllia serrata, Madracis decactis, Meandrina brasiliensis, Meandrina jacksoni, Meandrina meandrites, Micromussa multipunctata, Micromussa regularis, Millepora alcicornis, Millepora boschmai, Millepora braziliensis, Millepora complanata, Millepora foveolata, Millepora latifolia, Millepora nitida, Millepora squarrosa, Millepora striata, Millepora tuberosa, Montipora altasepta, Montipora angulata, Montipora australiensis, Montipora cactus, Montipora calcarea, Montipora caliculata, Montipora capricornis, Montipora cebuensis, Montipora cocosensis, Montipora corbettensis, Montipora crassituberculata, Montipora delicatula, Montipora dilatata, Montipora flabellata, Montipora florida, Montipora friabilis, Montipora gaimardi, Montipora hodgsoni, Montipora lobulata, Montipora mactanensis, Montipora maeandrina, Montipora malampaya, Montipora orientalis, Montipora patula, Montipora samarensis, Montipora setosa, Montipora stilosa, Montipora turtlensis, Montipora verruculosa, Montipora vietnamensis, Moseleya latistellata, Mussismilia braziliensis, Mussismilia harttii, Mussismilia hispida, Mussismilia leptophylla, Mycedium steeni, Mycetophyllia danaana, Mycetophyllia ferox, Nematostella vectensis, Nemenzophyllia turbida, Orbicella annularis, Orbicella faveolata, Pachyseris involuta, Pachyseris rugosa, Paragoniastrea deformis, Paramontastraea salebrosa, Paramontastraea serageldini, Paranemonia vouliagmeniensis, Parasimplastrea sheppardi, Pavona bipartita, Pavona cactus, Pavona danai, Pavona decussata, Pavona diffluens, Pavona venosa, Pavonia crispa, Pectinia africana, Pectinia alcicornis, Pectinia lactuca, Pectinia maxima, Physogyra lichtensteini, Platygyra yaeyamaensis, Plerogyra discus, Pleuractis seychellensis, Pleuractis taiwanensis, Pocillopora ankeli, Pocillopora danae, Pocillopora elegans, Pocillopora fungiformis, Pocillopora indiania, Pocillopora inflata, Polycyathus isabela, Porites aranetai, Porites attenuata, Porites cocosensis, Porites colonensis, Porites cumulatus, Porites desilveri, Porites eridani, Porites horizontalata, Porites napopora, Porites nigrescens, Porites okinawensis, Porites ornata, Porites pukoensis, Porites rugosa, Porites silimaniana, Porites sverdrupi, Porites tuberculosus, Psammocora stellata, Pseudodiploria strigosa, Rhizopsammia wellingtoni, Scolymia cubensis, Scolymia lacera, Scolymia wellsii, Seriatopora aculeata, Seriatopora dendritica, Siderastrea siderea, Stomphia coccinea, Stylocoeniella cocosensis, Stylophora madagascarensis, Tubastraea floreana, Turbinaria bifrons, Turbinaria heronensis, Turbinaria mesenterina, Turbinaria patula, Turbinaria reniformis, Turbinaria stellulata*	G-RL, BC, HEL
Echinodermata	*Actinopyga echinites, Actinopyga mauritiana, Actinopyga miliaris, Apostichopus japonicus, Apostichopus parvimensis, Asterina pancerii, Bohadschia maculisparsa, Centrostephanus longispinus, Hippasteria phrygiana, Holothuria arenacava, Holothuria fuscogilva, Holothuria lessoni, Holothuria nobilis, Holothuria platei, Holothuria scabra, Holothuria whitmaei, Isostichopus fuscus, Ophidiaster ophidianus, Pycnopodia helianthoides, Solaster endeca, Stichopus herrmanni, Thelenota ananas*	G-RL, BC, PR, HEL

Mollusca	*Abra prismatica, Acharax alinae, Adeuomphalus collinsi, Adeuomphalus elegans, Adeuomphalus trochanter, Alviniconcha adamantis, Alviniconcha boucheti, Alviniconcha hessleri, Alviniconcha kojimai, Alviniconcha marisindica, Alviniconcha strummeri, Bathyacmaea jonassoni, Bathyaustriella thionipta, Bathymodiolus antarcticus, Bathymodiolus brevior, Bathymodiolus elongatus, Bathymodiolus manusensis, Bathymodiolus marisindicus, Bathymodiolus puteoserpentis, Bathymodiolus septemdierum, Bruceiella globulus, Bruceiella wareni, Canarium elegans, Cantrainea jamsteci, Cantrainea nuda, Catillopecten vulcani, Charonia lampas, Charonia tritonis, Chrysomallon squamiferum, Cirroctopus hochbergi, Clathrosepta becki, Clelandella miliaris, Conus allaryi, Conus anabathrum, Conus ardisiaceus, Conus ateralbus, Conus belairensis, Conus bruguieresi, Conus cacao, Conus cepasi, Conus cloveri, Conus compressus, Conus crotchii, Conus cuneolus, Conus cuvieri, Conus decoratus, Conus duffyi, Conus echinophilus, Conus felitae, Conus fernandesi, Conus fontonae, Conus guinaicus, Conus henckesi, Conus hennequini, Conus hieroglyphus, Conus hybridus, Conus immelmani, Conus jeanmartini, Conus julii, Conus lugubris, Conus melvilli, Conus mercator, Conus mordeirae, Conus rawaiensis, Conus regonae, Conus richardbinghami, Conus salreiensis, Conus stearnsii, Conus tacomae, Conus teodorae, Conus thevenardensis, Conus unifasciatus, Conus xicoi, Cornisepta verenae, Ctenopelta porifera, Dendropoma petraeum, Desbruyeresia armata, Desbruyeresia cancellata, Desbruyeresia costata, Desbruyeresia marianaensis, Desbruyeresia marisindica, Desbruyeresia melanioides, Desbruyeresia spinosa, Diegus gasulli, Donacilla cornea, Dracogyra subfuscus, Dreissena caspia, Enigmaticolus marshalli, Epitonium clathrus, Erosaria spurca, Eupaludestrina foxianensis, Eupaludestrina scamandri, Falsimargarita nauduri, Fucaria mystax, Gibbula nivosa, Gigantidas gladius, Gigantidas horikoshii, Gigantidas taiwanensis, Gigantidas vrijenhoeki, Gigantopelta aegis, Gorgoleptis patulus, Haliotis corrugata, Haliotis cracherodii, Haliotis discus, Haliotis drogini, Haliotis fulgens, Haliotis geigeri, Haliotis gigantea, Haliotis kamtschatkana, Haliotis laevigata, Haliotis madaka, Haliotis mariae, Haliotis melculus, Haliotis midae, Haliotis rubiginosa, Haliotis rubra, Haliotis rufescens, Haliotis sorenseni, Haliotis stomatiaeformis, Haliotis tuberculata, Haliotis walallensis, Hanleyella henrici, Helicoradomenia parathermalis, Helicrenion reticulatum, Hippopus hippopus, Hippopus porcellanus, Hirtopelta hirta, Hirtopelta tufari, Hyalogyra vitrinelloides, Hydrobia djerbaensis, Ifremeria nautilei, Iheyaspira bathycodon, Iheyaspira lequios, Iphinopsis boucheti, Lacunoides exquisitus, Lacunoides vitreus, Laevicaspia ismailensis, Laeviphitus japonicus, Lamellomphalus manusensis, Lepetodrilus corrugatus, Lepetodrilus gordensis, Lepetodrilus japonicus, Lepetodrilus nux, Lepetodrilus schrolli, Leptogyra inflata, Lirapex politus, Lunatia pallida, Luria lurida, Lurifax japonicus, Macoma calcarea, Margarites manusensis, Margarites ryukyuensis, Melanodrymia galeronae, Melaraphe neritoides, Mitra zonata, Modiolus modiolus, Neolepetopsis densata, Neritina coronata, Neritina granosa, Nodopelta rigneae, Nodopelta subnoda, Nucula nucleus, Opisthoteuthis calypso, Opisthoteuthis chathamensis, Opisthoteuthis massyae, Opisthoteuthis mero, Ostrea edulis, Paralepetopsis rosemariae, Paralepetopsis tunnicliffae, Parvicardium hauniense, Patella nigra, Patella tarentina, Peltospira delicata, Peltospira lamellifera, Pholas dactylus, Phreagena edisonensis, Phymorhynchus carinatus, Phymorhynchus hyfifluxi, Phymorhynchus major, Phymorhynchus moskalevi, Phymorhynchus oculatus, Phymorhynchus starmeri, Phymorhynchus wareni, Pinna nobilis, Pinna rudis, Planorbidella depressa, Pliocardia crenulomarginata, Potamopyrgus kaitunuparaoa, Provanna buccinoides, Provanna clathrata, Provanna fenestrata, Provanna lucida, Provanna segonzaci, Provanna subglabra, Puncturella parvinobilis, Puncturella rimaizenaensis, Puncturella solis, Pyropelta bohlei, Pyropelta ryukyuensis, Pyropelta yamato, Ranella olearia, Schilderia achatidea, Scrobicularia plana, Shinkailepas myojinensis, Shinkailepas tollmanni, Shinkailepas tufari, Siphonaria compressa, Solemya flava, Solen vagina, Speculator cariosus, Stenothyra decollata, Sutilizona pterodon, Sutilizona theca, Symmetromphalus hageni, Thermosipho auzendei, Thyasira southwardae, Tomichia tristis, Tomichia ventricosa, Tomichia zwellendamensis, Tonna galea, Tridacna derasa, Tridacna gigas, Tridacna maxima, Tridacna mbalavuana, Tridacna rosewateri, Tridacna squamosa, Ventsia tricarinata, Vetulonia phalcata, Vulcanidas insolatus, Waisiuconcha helios, Xylodiscula major, Zonaria pyrum*	HEL, G-RL, BC, BSC, OSP, PR, HD
Ochrophyta	*Bifurcaria galapagensis, Cystoseira adriatica, Cystoseira amentacea, Cystoseira amentacea var. spicata, Cystoseira amentacea var. stricta, Cystoseira barbata, Cystoseira crinita, Cystoseira mediterranea, Cystoseira sedoides, Cystoseira spinosa, Cystoseira zosteroides, Desmarestia tropica, Dictyota galapagensis, Eisenia galapagensis, Laminaria rodriguezii, Sargassum setifolium, Spatoglossum schmittii*	G-RL, BC, BSC
Porifera	*Aplysina aerophoba, Asbestopluma hypogea, Axinella cannabina, Axinella polypoides, Cliona celata, Geodia cydonium, Ircinia foetida, Ircinia pipetta, Petrobiona massiliana, Tethya aurantium, Tethya citrina, Tethya vaurantium*	BC, HEL
Rhodophyta	*Acrosorium papenfussii, Austrofolium equatorianum, Galaxaura barbata, Goniolithon alternans, Gracilaria skottsbergii, Laurencia oppositocladia, Lithophyllum lichenoides, Myriogramme kylinii, Phycodrina elegans, Phyllophora brodiaei, Phyllophora nervosa, Phyllophora pseudoceranoides, Pseudolaingia hancockii, Ptilophora mediterranea, Schimmelmannia shousboei, Schizymenia ecuadoreana*	G-RL, BC, BSC
Tracheophyta	*Alisma wahlenbergii, Avicennia bicolor, Avicennia integra, Avicennia lanata, Avicennia rumphiana, Camptostemon philippinensis, Halophila beccarii, Halophila hawaiiana, Heritiera fomes, Heritiera globosa, Hippuris tetraphylla, Kewa acida, Pelliciera rhizophorae, Phyllospadix iwatensis, Phyllospadix japonicus, Posidonia oceanica, Posidonia sinuosa, Sonneratia griffithii, Tetramerista glabra, Zostera caespitosa, Zostera capensis, Zostera chilensis, Zostera marina, Zostera noltii*	HEL, G-RL, HD, BC, BSC

Table 7. Introduced species recorded in Europe and their status. Species were recorded on the World Record of Introduced Marine Species (WRiMS), on the European Alien Species Information Network (EASIN) or both.

Ablennes hians	*Chama macerophylla*	*Halimede ochtodes*	*Nephtys ciliata*	*Pyrgulina nana*
Abudefduf hoefleri	*Chama pacifica*	*Halimede tyche*	*Neptunea arthritica*	*Pyrgulina pirinthella*
Abudefduf saxatilis	*Champsodon capensis*	*Haliotis discus hannai*	*Nereis (Nereis) gilchristi*	*Pyrgulina pupaeformis*
Abudefduf sexfasciatus	*Champsodon nudivittis*	*Haliotis pustulata*	*Nereis jacksoni*	*Pyrunculus fourierii*
Abudefduf vaigiensis	*Champsodon vorax*	*Haliotis rufescens*	*Nereis persica*	*Pyura praeputialis*
Abyla trigona	*Chanos chanos*	*Haliotis rugosa pustulata*	*Nereis zonata*	*Pyura vittata*
Acantharctus posteli	*Charybdis (Archias) longicollis*	*Haliotis tuberculata*	*Nerita sanguinolenta*	*Quinqueloculina milletti*
Acanthaster planci	*Charybdis (Charybdis) feriata*	*Halisarca dujardinii*	*Nerocila orbignyi*	*Rachycentron canadum*
Acanthopagrus bifasciatus	*Charybdis (Charybdis) hellerii*	*Haliscera bigelowi*	*Netuma thalassina*	*Rangia cuneata*
Acanthopleura gemmata	*Charybdis (Charybdis) japonica*	*Halitiara inflexa*	*Nicidion cariboea*	*Rapana venosa*
Acanthurus chirurgus	*Charybdis (Goniohellenus) longicollis*	*Haloa japonica*	*Nikoides sibogae*	*Rastrelliger kanagurta*
Acanthurus coeruleus	*Cheilodipterus novemstriatus*	*Halocynthia roretzi*	*Nippoleucon hinumensis*	*Redicirce sulcata*
Acanthurus monroviae	*Chelicorophium curvispinum*	*Halopteris alternata*	*Nitidotellina lux*	*Reteporella jermanensis*
Acanthurus sohal	*Chelidonura fulvipunctata*	*Hamimaera hamigera*	*Nitidotellina valtonis*	*Retusa desgenettii*
Acar plicata	*Chelon labrosus*	*Haminoea cyanomarginata*	*Nodophthalmidium antillarum*	*Rhabdosargus haffara*
Acartia (Acanthacartia) tonsa	*Chelura terebrans*	*Haminoea japonica*	*Nolella stipata*	*Rhabdosoma whitei*
Acartia (Acartiura) omorii	*Chionoecetes opilio*	*Haplopoma graniferum*	*Nonionella stella*	*Rhinoclavis kochi*
Acartia (Odontacartia) centrura	*Chirocentrus dorab*	*Haplopoma impressum*	*Nosema ceratomyxae*	*Rhinoclavis sinensis*
Acervulina inhaerens	*Chiton hululensis*	*Haplosporidium nelsoni*	*Nothobomolochus fradei*	*Rhithropanopeus harrisii*
Achelia echinata	*Chondrochelia dubia*	*Harpacticus flexus*	*Notocochlis gualteriana*	*Rhizogeton nudus*
Acipenser baerii	*Chondrochelia savignyi*	*Hauerina diversa*	*Notomastus aberans*	*Rhizosolenia calcar-avis*
Acipenser gueldenstaedtii	*Choromytilus chorus*	*Haynesina germanica*	*Notomastus mossambicus*	*Rhizosolenia imbricata*
Acipenser nudiventris	*Chromis limbata*	*Hazeus ingressus*	*Notopus dorsipes*	*Rhizosolenia styliformis*
Acipenser ruthenus	*Chromodoris quadricolor*	*Hebella scandens*	*Notopygos crinita*	*Rhodine loveni*
Acipenser stellatus	*Chrysaora pseudoocellata*	*Heliaster helianthus*	*Nototeredo norvagica*	*Rhodosoma turcicum*
Acromegalomma claparedei	*Chrysiptera hemicyanea*	*Hemichromis bimaculatus*	*Novafabricia infratorquata*	*Rhopilema nomadica*
Acropoma japonicum	*Chrysopetalum debile*	*Hemidiscus cuneiformis*	*Nubiella mitra*	*Rhynchoconger trewavasae*
Actaea savignii	*Cibicides mabahethi*	*Hemigrapsus penicillatus*	*Nucellicola holmanae*	*Rhynchozoon larreyi*
Acteocina crithodes	*Cingulina isseli*	*Hemigrapsus sanguineus*	*Nudiscintilla glabra*	*Rimapenaeus similis*
Acteocina mucronata	*Ciona intestinalis*	*Hemigrapsus takanoi*	*Nuttallia obscurata*	*Rissoina ambigua*
Actinocyclus normanii	*Ciona robusta*	*Hemimysis anomala*	*Obelia bidentata*	*Rissoina bertholleti*
Actumnus globulus	*Ciona savignyi*	*Hemiramphus far*	*Obelia dichotoma*	*Rissoina spirata*
Aequorea conica	*Circenita callipyga*	*Heniochus acuminatus*	*Obelia geniculata*	*Robertgurneya rostrata*
Aequorea globosa	*Circulus novemcarinatus*	*Heniochus intermedius*	*Obelia longissima*	*Robertsonia salsa*
Aequorea macrodactyla	*Cirrenalia basiminuta*	*Heniochus varius*	*Oblimopa multistriata*	*Ruditapes decussatus*
Aetea anguina	*Cirrholovenia tetranema*	*Herbstia nitida*	*Ocenebra inornata*	*Ruditapes philippinarum*
Aetea sica	*Cirriformia semicincta*	*Herdmania momus*	*Ochetostoma erythrogrammon*	*Rugalucina angela*

Aeverrillia setigera
Afrocardium richardi
Afropinnotheres monodi
Afruca tangeri
Agglutinella compressa
Agglutinella robusta
Aglaophenia pluma
Aidanosagitta neglecta
Aiptasia pulchella
Akatopora leucocypha
Alcyonidium polyoum
Alectryonella plicatula
Alepes djedaba
Aliculastrum cylindricum
Alitta succinea
Alitta virens
Alkmaria romijni
Allolepidapedon fistulariae
Alosa fallax
Alpheus edwardsii
Alpheus inopinatus
Alpheus lobidens
Alpheus macrocheles
Alpheus migrans
Alpheus platydactylus
Alpheus rapacida
Alvania dorbignyi
Alveinus miliaceus
Amathia gracilis
Amathia gracillima
Amathia imbricata
Amathia verticillata
Amathia vidovici
Amathina tricarinata
Ambassis dussumieri
Ambunguipes rufocincta
Ameira divagans divagans
Ameiurus catus
Ammophila arenaria
Ammothea hilgendorfi
Ammothella appendiculata
Ammothella longioculata
Ampelisca cavicoxa
Ampelisca heterodactyla
Cladonema radiatum
Clava multicornis
Clavelina lepadiformis
Clavelina oblonga
Clavellisa ilishae
Clavulina angularis
Clementia papyracea
Cliona celata
Cliona thoosina
Clorida albolitura
Clupeonella cultriventris
Clymenella torquata
Clypeomorus bifasciata
Clytia hemisphaerica
Clytia hummelincki
Clytia linearis
Coelorinchus occa
Coleusia signata
Conger conger
Conomurex decorus
Conomurex persicus
Conopeum reticulum
Conopeum seurati
Conus arenatus
Conus fumigatus
Conus rattus
Coptodon zillii
Corambe obscura
Cordylophora caspia
Coregonus lavaretus
Coregonus maraena
Coregonus muksun
Coregonus nasus
Corella eumyota
Corella inflata
Corethron pennatum
Cornigerius maeoticus
Corophium volutator
Corymorpha annulata
Corymorpha bigelowi
Coryne eximia
Coryogalops ocheticus
Coryphellina rubrolineata
Coryphoblennius galerita
Herklotsichthys punctatus
Herrmannella duggani
Hesionides arenaria
Hesionura serrata
Hesperibalanus fallax
Heterocyclina tuberculata
Heterolaophonte hamondi
Heteromastus filiformis
Heterosaccus dollfusi
Heterostegina depressa
Heterotentacula mirabilis
Hexapleomera robusta
Hexaplex trunculus
Hiatula rosea
Himantura leoparda
Himantura uarnak
Hinea punctostriata
Hippaliosina acutirostris
Hippocampus fuscus
Hippocampus hippocampus
Hippocampus kuda
Hippoglossus hippoglossus
Hippopodina feegeensis
Hippopodina iririkiensis
Hirudinella ventricosa
Holacanthus africanus
Holacanthus ciliaris
Holothuria (Roweothuria) arguinensis
Homalaspis plana
Homarus americanus
Homotrema rubrum
Huso huso
Hyastenus hilgendorfi
Hyboscolex longiseta
Hydrodendron mirabile
Hydroides albiceps
Hydroides brachyacantha
Hydroides dianthus
Hydroides dirampha
Hydroides elegans
Hydroides ezoensis
Hydroides heterocera
Hydroides homoceros
Hydroides minax
Ocinebrellus inornatus
Octactis speculum
Octopus cyanea
Octotiara russelli
Oculina patagonica
Odontella sinensis
Odontodactylus scyllarus
Odostomia lorioli
Odostomia widmeri
Ogyrides mjoebergi
Oithona davisae
Oithona plumifera
Okenia longiductis
Olindias singularis
Ommastrephes bartramii
Omobranchus punctatus
Oncorhynchus clarkii
Oncorhynchus gorbuscha
Oncorhynchus keta
Oncorhynchus kisutch
Oncorhynchus mykiss
Oncorhynchus nerka
Oncorhynchus tshawytscha
Onisimus sextonae
Onuphis eremita
Operculina ammonoides
Ophiactis macrolepidota
Ophiactis savignyi
Ophioblennius atlanticus
Ophiocoma scolopendrina
Ophryotrocha diadema
Ophryotrocha japonica
Ophryotrocha puerilis
Opisthosyllis brunnea
Oplegnathus fasciatus
Orchestia gammarellus
Orchestia mediterranea
Oreochromis aureus
Oreochromis mossambicus
Oreochromis niloticus
Oscilla galilae
Oscilla jocosa
Oshurkovia littoralis
Osmerus mordax
Sabella spallanzanii
Sabia conica
Saccostrea cuccullata
Saccostrea cucullata
Saccostrea glomerata
Saduria entomon
Salicornia bigelovii
Salmacina dysteri
Salmo salar
Salmo trutta
Salsola kali
Salsola soda
Salvelinus alpinus
Salvelinus fontinalis
Sander lucioperca
Sardinella aurita
Sardinella gibbosa
Sargocentron rubrum
Saron marmoratus
Sarpa salpa
Sarsamphiascus minutus
Sarsamphiascus tenuiremis
Sarsamphiascus varians
Saurida lessepsianus
Saurida macrolepis
Savignyella lafontii
Savoryella lignicola
Scarus ghobban
Scatophagus argus
Scherocumella gurneyi
Schistomeringos rudolphi
Schizobrachiella verrilli
Schizoporella errata
Schizoporella japonica
Schizoporella pungens
Schizoporella unicornis
Schizoretepora hassi
Schlumbergerina alveoliniformis
Sciaenops ocellatus
Scolelepis (Parascolelepis) tridentata
Scolelepis (Scolelepis) squamata
Scolelepis korsuni
Scolelepis tridentata
Scoletoma debilis

Amphibalanus amphitrite	*Coscinodiscus wailesii*	*Hydroides norvegica*	*Ostorhinchus fasciatus*	*Scolionema suvaense*
Amphibalanus amphitrite amphitrite	*Coscinospira hemprichii*	*Hydroides operculata*	*Ostracion cubicum*	*Scomberomorus commerson*
Amphibalanus eburneus	*Cossura coasta*	*Hydroides sanctaecrucis*	*Ostrea angasi*	*Scophthalmus maximus*
Amphibalanus improvisus	*Costellipitar chordatus*	*Hymeniacidon perlevis*	*Ostrea chilensis*	*Scorpiodinipora costulata*
Amphibalanus reticulatus	*Cotylorhiza erythraea*	*Hyotissa hyotis*	*Ostrea denselamellosa*	*Scottolana longipes*
Amphibalanus variegatus	*Cradoscrupocellaria bertholletii*	*Hyotissa inermis*	*Ostrea edulis*	*Scruparia ambigua*
Amphicorina pectinata	*Crassicorophium bonellii*	*Hypania invalida*	*Ostrea puelchana*	*Scyllarus caparti*
Amphimedon chloros	*Crassostrea rivularis*	*Hypaniola kowalewskii*	*Ostrea stentina*	*Sebastapistes nuchalis*
Amphioctopus aegina	*Crassostrea sikamea*	*Hypogastrura viatica*	*Oulastrea crispata*	*Sebastes schlegelii*
Amphiodia (Amphispina) obtecta	*Crassostrea virginica*	*Hypophthalmichthys molitrix*	*Owenia borealis*	*Sebastiscus marmoratus*
Amphioplus (Lymanella) laevis	*Crenidens crenidens*	*Hyporhamphus affinis*	*Oxydromus pallidus*	*Sepia pharaonis*
Amphiprion chrysopterus	*Crepidacantha poissonii*	*Hypselodoris infucata*	*Oxynoe viridis*	*Sepioteuthis lessoniana*
Amphisbetia operculata	*Crepidula fornicata*	*Hyrtios erectus*	*Oxyurichthys papuensis*	*Septifer cumingii*
Amphisorus hemprichii	*Crepidula onyx*	*Hysterolecitha sigani*	*Oxyurichthys petersii*	*Septloculina rotunda*
Amphistegina lessonii	*Crepipatella dilatata*	*Ianiropsis serricaudis*	*Pachycerianthus solitarius*	*Septloculina tortuosa*
Amphistegina lobifera	*Crisia eburnea*	*Idyella pallidula*	*Pachycordyle michaeli*	*Seriola fasciata*
Amphogona pusilla	*Crisia eburneodenticulata*	*Imogine necopinata*	*Pachycordyle navis*	*Seriola rivoliana*
Ampithoe valida	*Cristapseudes omercooperi*	*Incisocalliope aestuarius*	*Pachygrapsus gracilis*	*Serpula hartmanae*
Anadara broughtonii	*Crisularia plumosa*	*Indothais lacera*	*Pachygrapsus transversus*	*Sertularella mediterranea*
Anadara inaequivalvis	*Crisularia serrata*	*Indothais sacellum*	*Pacificincola perforata*	*Shepheardella taeniformis*
Anadara kagoshimensis	*Critomolgus actiniae*	*Iniistius pavo*	*Pagrus major*	*Sicyonia lancifer*
Anadara natalensis	*Cryptocentrus caeruleopunctatus*	*Iolaea neofelixoides*	*Palaemon adspersus*	*Sigambra constricta*
Anadara transversa	*Cryptosoma cristatum*	*Iphione muricata*	*Palaemon carinicauda*	*Sigambra parva*
Anas platyrhynchos	*Cryptosula pallasiana*	*Ischyrocerus commensalis*	*Palaemon elegans*	*Sigambra tentaculata*
Angiola punctostriata	*Cuapetes calmani*	*Isognomon bicolor*	*Palaemon macrodactylus*	*Siganus fuscescens*
Anguilla anguilla	*Cucurbitula cymbium*	*Isognomon legumen*	*Palaemonella rotumana*	*Siganus javus*
Anguilla rostrata	*Cumulospora marina*	*Isognomon radiatus*	*Palmadusta lentiginosa*	*Siganus luridus*
Anguillicola crassus	*Cumulospora varia*	*Isolda pulchella*	*Palola valida*	*Siganus rivulatus*
Anguinella palmata	*Cushmanina striatopunctata*	*Istiblennius meleagris*	*Pampus argenteus*	*Sigmamiliolinella australis*
Anilocra pilchardi	*Cuthona perca*	*Istiompax indica*	*Panulirus ornatus*	*Sigmoihauerina bradyi*
Anisolabis maritima	*Cyclichthys spilostylus*	*Ixa monodi*	*Panulirus regius*	*Silhouettea aegyptia*
Anomia chinensis	*Cycloforina quinquecarinata*	*Janua heterostropha*	*Papilloculiceps longiceps*	*Sillago sihama*
Anomia simplex	*Cyclopinella multispinosa*	*Jassa marmorata*	*Parablennius incognitus*	*Sillago suezensis*
Anoplodactylus californicus	*Cyclopterus lumpus*	*Jassa slatteryi*	*Paracanthurus hepatus*	*Simplaria pseudomilitaris*
Anoplodactylus digitatus	*Cyclorbiculina compressa*	*Jaydia queketti*	*Paracaprella pusilla*	*Sinelobus stanfordi*
Anteaeolidiella lurana	*Cycloscala hyalina*	*Jaydia smithi*	*Paracartia grani grani*	*Sinelobus vanhaareni*
Antennella secundaria	*Cylichna villersii*	*Joculator problematicus*	*Paracerceis sculpta*	*Siphogenerina raphanus*
Antigona lamellaris	*Cylista elegans*	*Juncus acutus*	*Paracytaeis octona*	*Siphonaperta distorqueata*
Aoroides curvipes	*Cylista ornata*	*Juncus filiformis*	*Paradella dianae*	*Siphonaperta pittensis*
Aoroides longimerus	*Cymadusa filosa*	*Juxtacribrilina mutabilis*	*Paradoxapseudes intermedius*	*Siphonaria crenata*
Apanthura sandalensis	*Cymbaloporetta plana*	*Kantiella enigmatica*	*Paradyte crinoidicola*	*Siphonaria pectinata*

Aphaniops dispar	*Cymothoa indica*	*Keratella tropica*	*Paraehlersia weissmannioides*	*Sirpus zariquieyi*
Aphelochaeta marioni	*Cynoglossus sinusarabici*	*Kirchenpaueria halecioides*	*Paralaeospira malardi*	*Skeletonema costatum*
Apionsoma (Apionsoma) misakianum	*Cynoscion regalis*	*Kirkegaardia dorsobranchialis*	*Paralaophonte (Paralaophonte) congenera*	*Skeletonema subsalsum*
Apionsoma (Apionsoma) trichocephalus	*Cyprinus carpio*	*Knipowitschia caucasica*	*Paraleucilla magna*	*Smaragdia souverbiana*
Aplidium accarense	*Cystodytes dellechiajei*	*Koinostylochus ostreophagus*	*Paralia sulcata*	*Smittina nitidissima*
Aplidium glabrum	*Cystodytes philippinensis*	*Labidocera acutifrons*	*Paralichthys lethostigma*	*Smittoidea prolifica*
Aplysia dactylomela	*Dactylopterus volitans*	*Labyrinthula zosterae*	*Paralithodes camtschaticus*	*Solea senegalensis*
Aplysia parvula	*Dagetichthys lusitanicus*	*Lagocephalus guentheri*	*Paramphiascella fulvofasciata*	*Solea solea*
Apocorophium acutum	*Daira perlata*	*Lagocephalus lagocephalus*	*Paramphiascella vararensis*	*Solenocera crassicornis*
Apogonichthyoides pharaonis	*Dasybranchus carneus*	*Lagocephalus sceleratus*	*Paramphitrite birulai*	*Solidobalanus fallax*
Apoprionospio pygmaea	*Decapterus russelli*	*Lagocephalus spadiceus*	*Paramysis (Mesomysis) intermedia*	*Sorites orbiculus*
Aquilonastra burtoni	*Delavalia inopinata*	*Lagocephalus suezensis*	*Paramysis (Serrapalpisis) lacustris*	*Sorites variabilis*
Arachnidium lacourti	*Delavalia minuta*	*Lamprohaminoea ovalis*	*Paranais frici*	*Sorsogona prionota*
Arachnoidella protecta	*Dendostrea folium*	*Laodicea fijiana*	*Paranthias furcifer*	*Sousa plumbea*
Arbopercula tenella	*Dendostrea frons*	*Laomedea calceolifera*	*Paranthura japonica*	*Sparisoma cretense*
Arca navicularis	*Dendostrea sandvichensis*	*Laomedea flexuosa*	*Paraonides nordica*	*Spartina alterniflora*
Arcania brevifrons	*Dendrodoris fumata*	*Laonice norgensis*	*Paraprionospio coora*	*Spartina anglica*
Arctapodema australis	*Dermatobranchus rubidus*	*Laonome calida*	*Pararotalia calcariformata*	*Spartina cynosuroides*
Arcuatula perfragilis	*Desdemona ornata*	*Laonome triangularis*	*Pararotalia spinigera*	*Spartina densiflora*
Arcuatula senhousia	*Detonula pumila*	*Lateolabrax japonicus*	*Parasmittina egyptiaca*	*Spartina maritima*
Argopecten irradians	*Diadema setosum*	*Laternula anatina*	*Parasmittina protecta*	*Spartina patens*
Arhynchite arhynchite	*Diadumene cincta*	*Laticauda colubrina*	*Parasmittina serruloides*	*Spartina townsendii*
Aricidea (Aricidea) fragilis	*Diadumene leucolena*	*Laticorophium baconi*	*Parasmittina spondylicola*	*Sparus aurata*
Aricidea hartmani	*Diadumene lineata*	*Latigammaropsis togoensis*	*Parasorites orbitolitoides*	*Sphaerocoryne bedoti*
Arietellus pavoninus	*Diala semistriata*	*Latopilumnus malardi*	*Paratapes textile*	*Sphaeroma quoianum*
Arius parkii	*Diamysis bahirensis*	*Lecithochirium magnicaudatum*	*Paratrochammina madeirae*	*Sphaeroma serratum*
Arothron hispidus	*Dicentrarchus labrax*	*Leiochrides australis*	*Parexocoetus mento*	*Sphaeroma walkeri*
Articulina alticostata	*Didemnum candidum*	*Leiognathus berbis*	*Parougia caeca*	*Sphaerozius nitidus*
Articulina mayori	*Didemnum perlucidum*	*Leiosolenus aristatus*	*Parthenina cossmanni*	*Sphenia rueppellii*
Articulina pacifica	*Didemnum vexillum*	*Leiosolenus hanleyanus*	*Parthenina typica*	*Sphoeroides pachygaster*
Ascidia cannelata	*Dikerogammarus villosus*	*Leocrates chinensis*	*Parupeneus forsskali*	*Sphyraena chrysotaenia*
Ascidiella aspersa	*Dikoleps micalii*	*Leodice antennata*	*Parvocalanus crassirostris*	*Sphyraena flavicauda*
Ascidiella scabra	*Diodora funiculata*	*Leonnates decipiens*	*Parvocalanus elegans*	*Sphyraena obtusata*
Ashtoret lunaris	*Diodora ruppellii*	*Leonnates indicus*	*Parvocalanus latus*	*Sphyraena pinguis*
Aspidelectra melolontha	*Diopatra hupferiana hupferiana*	*Leonnates persicus*	*Patelloida saccharina*	*Spinocalanus terranovae*
Aspidosiphon (Akrikos) mexicanus	*Diopatra hupferiana monroi*	*Lepas (Lepas) anatifera*	*Patinella radiata*	*Spiophanes algidus*
Aspidosiphon (Aspidosiphon) elegans	*Diopatra marocensis*	*Lepas (Lepas) anserifera*	*Pecten maximus*	*Spirobranchus giganteus*
Astacolus insolitus	*Diphasia digitalis*	*Lepidochelys olivacea*	*Pegidia lacunata*	*Spirobranchus kraussii*
Asterias amurensis	*Diplogrammus randalli*	*Lepidonotus carinulatus*	*Pelagia benovici*	*Spirobranchus tetraceros*
Asterias rubens	*Diplosoma listerianum*	*Lepidonotus tenuisetosus*	*Pelagia noctiluca*	*Spirobranchus triqueter*

Asterionellopsis glacialis
Asterocarpa humilis
Asteromphalus sarcophagus
Atactodea striata
Atergatis roseus
Athanas nitescens
Atherina boyeri
Atherinomorus forskalii
Atherinomorus lacunosus
Atrina rigida
Attheya decora
Atys angustatus
Atys macandrewii
Aulacomya atra
Aurelia coerulea
Aurelia solida
Austrominius modestus
Avenella flexuosa
Axelsonia littoralis
Babka gymnotrachelus
Baccharis halimifolia
Bacteriastrum comosum
Bacteriastrum hyalinum
Baeolidia moebii
Balantidium sigani
Balanus glandula
Balanus trigonus
Balistoides conspicillum
Bankia bipennata
Bankia carinata
Bankia fimbriatula
Barbatia trapezina
Barentsia benedeni
Barentsia ramosa
Barnea candida
Bathygobius cyclopterus
Batillaria attramentaria
Batillaria zonalis
Bedeva paivae
Belzebub hanseni
Bemlos leptocheirus
Dipolydora armata
Dipolydora blakei
Dipolydora flava
Dipolydora giardi
Dipolydora quadrilobata
Dipolydora socialis
Dipterygonotus balteatus
Dispio uncinata
Distaplia bermudensis
Distaplia corolla
Divalinga arabica
Dodecaceria capensis
Dorippe quadridens
Dorvillea similis
Dosima fascicularis
Dosinia erythraea
Doxander vittatus
Dreissena polymorpha
Dreissena rostriformis
Dreissena rostriformis bugensis
Drepanophora birbira
Drymonema dalmatinum
Dussumieria elopsoides
Duvaucelia plebeia
Dynamena disticha
Dynamena quadridentata
Dynamene bidentata
Dynamene edwardsi
Dyspanopeus sayi
Echinogammarus trichiatus
Echinolittorina punctata
Ecteinascidia styeloides
Ecteinascidia thurstoni
Ecteinascidia turbinata
Ectopleura crocea
Edentostomina cultrata
Elamena mathoei
Elasmopus pectenicrus
Elates ransonnettii
Electra monostachys
Electroma vexillum
Lepomis gibbosus
Leptochela (Leptochela) aculeocaudata
Leptochela (Leptochela) pugnax
Leptochela aculeocaudata
Lernanthropus callionymicola
Lesueurigobius sanzi
Leucaspius delineatus
Leucotina eva
Leucotina natalensis
Libinia dubia
Licornia jolloisii
Lienardia mighelsi
Ligophorus kaohsianghsieni
Limnoperna fortunei kikuchii
Limnoria quadripunctata
Limnoria tripunctata
Limulus polyphemus
Lineus sanguineus
Linopherus canariensis
Lioberus ligneus
Liocarcinus navigator
Lioloma pacificum
Lipophrys pholis
Lissoclinum perforatum
Lissodendoryx (Waldoschmittia) schmidti
Littorina littorea
Littorina saxatilis
Liza haematocheila
Lodderia novemcarinata
Loimia medusa
Lovenella assimilis
Lucicutia clausi
Lucifer hanseni
Lucifer typus
Lumbricillus lineatus
Lumbrinerides neogesae
Lumbrineris acutifrons
Lumbrineris inflata
Lumbrineris perkinsi
Lutjanus argentimaculatus
Lutjanus fulviflamma
Pelates quadrilineatus
Pempheris rhomboidea
Penaeopsis serrata
Penaeus aztecus
Penaeus hathor
Penaeus japonicus
Penaeus merguiensis
Penaeus monodon
Penaeus pulchricaudatus
Penaeus semisulcatus
Peneroplis antillarum
Peneroplis arietinus
Peneroplis pertusus
Penilia avirostris
Pennaria disticha
Perccottus glenii
Percnon gibbesi
Perinereis nuntia
Perisesarma alberti
Peristedion cataphractum
Perkinsyllis augeneri
Perna perna
Perna viridis
Perophora japonica
Perophora multiclathrata
Perophora viridis
Petalifera gravieri
Petricola fabagella
Petricolaria pholadiformis
Petroscirtes ancylodon
Phaeostachys spinifera
Phallusia nigra
Phascolion (Isomya) convestitum
Phascolion (Phascolion) caupo
Phascolosoma (Phascolosoma) scolops
Pherusella brevituba
Phialella quadrata
Phidiana militaris
Philinopsis speciosa
Phleum pratense
Photis lamellifera
Spiroloculina angulata
Spiroloculina antillarum
Spiroloculina nummiformis
Spirorbis (Spirorbis) marioni
Spirorbis marioni
Spondylus groschi
Spondylus nicobaricus
Spondylus spinosus
Spratelloides delicatulus
Squalus megalops
Stegastes variabilis
Stenopus spinosus
Stenothoe eduardi
Stenothoe gallensis
Stenothoe georgiana
Stephanolepis diaspros
Stephanopyxis palmeriana
Stephos cryptospinosus
Stephos marsalensis
Sternodromia spinirostris
Steromphala adansonii
Steromphala adriatica
Steromphala albida
Steromphala cineraria
Sticteulima lentiginosa
Stolephorus indicus
Stolephorus insularis
Stomatella impertusa
Stomolophus meleagris
Stramonita haemastoma
Streblosoma comatus
Streblosoma pseudocomatus
Streblospio benedicti
Streblospio gynobranchiata
Streptosyllis varians
Styela canopus
Styela clava
Styela plicata
Stylarioides grubei
Stylochus flevensis
Stylochus necopinata

Benthophilus stellatus
Beroe ovata
Beroe ovatus
Berthellina citrina
Bhawania goodei
Biflustra arborescens
Biflustra grandicella
Biflustra savartii
Bimeria vestita
Bispira polyomma
Biuve fulvipunctata
Blackfordia virginica
Blennius ocellaris
Boccardia polybranchia
Boccardia proboscidea
Boccardia semibranchiata
Boccardiella hamata
Boccardiella ligerica
Bolinopsis vitrea
Bolinus brandaris
Bolivina simpsoni
Bonamia exitiosa
Bonamia ostreae
Boninia neotethydis
Borelis schlumbergeri
Bostrycapulus aculeatus
Bostrycapulus odites
Botrylloides diegensis
Botrylloides giganteum
Botrylloides leachii
Botrylloides niger
Botrylloides nigrum
Botrylloides violaceus
Botryllus schlosseri
Bougainvillia muscus
Bougainvillia niobe
Bougainvillia rugosa
Brachidontes exustus
Brachidontes pharaonis
Brachynotus sexdentatus
Branchiomma bairdi
Branchiomma boholense
Branchiomma luctuosum
Branchiosyllis exilis
Elphidium charlottense
Elphidium striatopunctatum
Elymus repens
Elysia grandifolia
Elysia ornata
Elysia tomentosa
Enchelycore anatina
Enchytraeus albidus
Endeis spinosa
Engina mendicaria
Ensiculus cultellus
Ensis leei
Entelurus aequoreus
Eocuma dimorphum
Eocuma rosae
Eocuma sarsii
Ephippion guttifer
Epinephelus areolatus
Epinephelus caninus
Epinephelus chlorostigma
Epinephelus coioides
Epinephelus fasciatus
Epinephelus fuscoguttatus
Epinephelus malabaricus
Epinephelus merra
Epistomaroides punctulata
Equulites elongatus
Equulites klunzingeri
Ercolania viridis
Ergalatax contracta
Ergalatax junionae
Ergalatax martensi
Ericthonius difformis
Ericthonius punctatus
Erinaceusyllis serratosetosa
Eriocheir sinensis
Erugosquilla massavensis
Ervilia scaliola
Escharina vulgaris
Ethminolia hemprichii
Etrumeus golanii
Eucheilota menoni
Eucheilota paradoxica
Eucheilota ventricularis
Lutjanus sebae
Lymnaea stagnalis
Lyonsia norwegica
Lyrodus pedicellatus
Lyrodus takanoshimensis
Lysidice collaris
Lysidice natalensis
Lysmata kempi
Lysmata uncicornis
Lysmata vittata
Macrobrachium olfersii
Macrobrachium rosenbergii
Macromedaeus voeltzkowii
Macrorhynchia philippina
Mactra lilacea
Mactra olorina
Maeotias marginata
Maera grossimana
Magallana angulata
Magallana gigas
Malleus regula
Marenzelleria arctia
Marenzelleria neglecta
Marenzelleria viridis
Marginella glabella
Marionia blainvillea
Maritigrella fuscopunctata
Marivagia stellata
Marmorofusus verrucosus
Marphysa adenensis
Marphysa sanguinea
Marphysa victori
Marteilia refringens
Martesia striata
Matuta victor
Mawia benovici
Mediomastus capensis
Megabalanus coccopoma
Megabalanus tintinnabulum
Megabalanus tintinnabulum tintinnabulum
Megalomma claparedei
Megastomia lorioli
Melibe viridis
Melita nitida
Photis longicaudata
Phtisica marina
Phyllodoce longifrons
Phyllorhiza punctata
Physalia physalis
Pigrogromitus timsanus
Pileolaria berkeleyana
Pileolaria militaris
Pilumnoides inglei
Pilumnopeus africanus
Pilumnopeus vauquelini
Pilumnus minutus
Pilumnus spinifer
Pinctada imbricata
Pinctada imbricata radiata
Pinctada margaritifera
Pinctada radiata
Pinguipes brasilianus
Pisione guanche
Pisodonophis semicinctus
Pista unibranchia
Placida dendritica
Plagusia depressa
Plagusia squamosa
Planaxis savignyi
Planiliza carinata
Planiliza haematocheilus
Planispirinella exigua
Planogypsina acervalis
Planogypsina squamiformis
Planostrea pestigris
Platax teira
Platorchestia platensis
Platycephalus indicus
Platynereis australis
Plecoglossus altivelis
Pleurobranchus forskalii
Pleurosigma simonsenii
Pleurosira laevis
Plicatula plicata
Plocamopherus ocellatus
Plocamopherus tilesii
Plotosus lineatus
Plumularia setacea
Suberites massa
Subeucalanus crassus
Subeucalanus subcrassus
Sulculeolaria turgida
Sundstroemia setigera
Syllis alosae
Syllis bella
Syllis ergeni
Syllis gracilis
Syllis hyllebergi
Syllis pectinans
Syllis schulzi
Symplectoscyphus tricuspidatus
Symplegma brakenhielmi
Symplegma reptans
Symplegma rubra
Synanceia verrucosa
Synaptula reciprocans
Synchiropus sechellensis
Synelmis rigida
Syngnathus abaster
Synidotea laevidorsalis
Synidotea laticauda
Synischia hectica
Syphonota geographica
Syrnola cinctella
Syrnola fasciata
Syrnola lendix
Taeniacanthus lagocephali
Tanais dulongii
Tanystylum orbiculare
Taractes rubescens
Tayuva lilacina
Telmatogeton japonicus
Temora turbinata
Tenellia adspersa
Terapon jarbua
Terapon puta
Terapon theraps
Terebella ehrenbergi
Terebella lapidaria
Teredo bartschi
Teredo navalis
Teredothyra dominicensis

Bregmaceros atlanticus	*Euchone limnicola*	*Melita palmata*	*Podarkeopsis capensis*	*Tesseropora atlantica*
Bregmaceros nectabanus	*Eucidaris tribuloides*	*Melithaea erythraea*	*Podocerus cristatus*	*Tetrancistrum polymorphum*
Bugula neritina	*Eucrate crenata*	*Membranipora membranacea*	*Poecilia latipinna*	*Tetrancistrum strophosolenus*
Bugulina flabellata	*Eudendrium capillare*	*Menaethius monoceros*	*Poecilopsetta beanii*	*Tetrancistrum suezicum*
Bugulina fulva	*Eudendrium carneum*	*Mercenaria mercenaria*	*Polyandrocarpa zorritensis*	*Tetrapturus georgii*
Bugulina simplex	*Eudendrium merulum*	*Meretrix lusoria*	*Polycera hedgpethi*	*Tetrorchis erythrogaster*
Bugulina stolonifera	*Eudendrium vaginatum*	*Merhippolyte ancistrota*	*Polycerella emertoni*	*Tetrosomus gibbosus*
Bulla arabica	*Eulalia clavigera*	*Mertensia ovum*	*Polycirrus twisti*	*Thalamita gloriensis*
Bursatella leachii	*Eulalia viridis*	*Mesanthura romulea*	*Polyclinum aurantium*	*Thalamita indistincta*
Bythocaris cosmetops	*Eumetopias jubatus*	*Metacalanus acutioperculum*	*Polyclinum constellatum*	*Thalamita poissonii*
Caesio varilineata	*Eumida sanguinea*	*Metapenaeopsis aegyptia*	*Polydora ciliata*	*Thalamoporella harmelini*
Cakile maritima	*Eunaticina papilla*	*Metapenaeopsis mogiensis consobrina*	*Polydora colonia*	*Thalamoporella rozieri*
Calanopia elliptica	*Eunice floridana*	*Metapenaeus affinis*	*Polydora cornuta*	*Thalassionema nitzschioides*
Calanopia media	*Eunice tubifex*	*Metapenaeus monoceros*	*Polydora hoplura*	*Thalassiosira nordenskioeldii*
Calappa hepatica	*Euplana gracilis*	*Metapenaeus stebbingi*	*Polydora limicola*	*Thalassiosira punctigera*
Caligus lagocephali	*Eurycarcinus integrifrons*	*Metasychis gotoi*	*Polydora spongicola*	*Thalassiosira tealata*
Caligus pageti	*Eurypanopeus depressus*	*Metaxia bacillum*	*Polydora websteri*	*Thalassiothrix mediterranea*
Callinectes bocourti	*Eurytemora americana*	*Metridium senile*	*Polylabris mamaevi*	*Tharyx killariensis*
Callinectes danae	*Eurytemora carolleeae*	*Micippa thalia*	*Pomacanthus imperator*	*Thecacera pennigera*
Callinectes exasperatus	*Eurytemora pacifica*	*Microchirus azevia*	*Pomacanthus maculosus*	*Theora lubrica*
Callinectes sapidus	*Eurythoe complanata*	*Microcosmus exasperatus*	*Pomacanthus paru*	*Thuridilla mazda*
Callionymus filamentosus	*Eurythoe laevisetis*	*Microcosmus squamiger*	*Pomacanthus xanthometopon*	*Thyasira succisa*
Callionymus lyra	*Eusarsiella zostericola*	*Microlipophrys adriaticus*	*Pomadasys stridens*	*Timarete anchylochaeta*
Callista florida	*Eusyllis kupfferi*	*Micromesistius poutassou*	*Pomatoschistus bathi*	*Timarete caribous*
Callopora craticula	*Euterpina acutifrons*	*Microphthalmus similis*	*Pontinus kuhlii*	*Timarete dasylophius*
Callopora lineata	*Euthymonacha polita*	*Micropogonias undulatus*	*Porcellana africana*	*Timarete punctata*
Caloria indica	*Eutintinnus lusus-undae*	*Microporella browni*	*Porcelloides tenuicaudus*	*Tonicia chilensis*
Calyptospadix cerulea	*Eutintinnus lususundae*	*Microporella coronata*	*Poromya granulata*	*Tornus jullieni*
Calyptotheca alexandriensis	*Evadne anonyx*	*Microporella genisii*	*Porpita porpita*	*Torpedo sinuspersici*
Calyptraea chinensis	*Exaiptasia diaphana*	*Microporella harmeri*	*Portunus (Portunus) segnis*	*Torquigener flavimaculosus*
Campanularia morgansi	*Exogone (Exogone) breviantennata*	*Miliolinella fichteliana*	*Portunus pelagicus*	*Toxonidea insignis*
Canarium mutabile	*Exogone africana*	*Millerella pannosa*	*Portunus segnis*	*Trachurus indicus*
Cancer irroratus	*Fabienna oligonema*	*Millerigobius macrocephalus*	*Potamocorbula amurensis*	*Trachysalambria curvirostris*
Cancer pagurus	*Fabriciola ghardaqa*	*Mimachlamys sanguinea*	*Potamopyrgus antipodarum*	*Trachysalambria palaestinensis*
Candiella plebeia	*Favella brevis*	*Mitrapus oblongus*	*Potamothrix bavaricus*	*Trachyscorpia cristulata*
Canuellina insignis	*Favonigobius melanobranchus*	*Mitrella psilla*	*Praunus flexuosus*	*Transkeia bogii*
Capitella capitata	*Favorinus ghanensis*	*Mitrocomium medusiferum*	*Predanophora longiuscula*	*Trapania toddi*
Capitellethus dispar	*Fenestrulina delicia*	*Mitromorpha cachiai*	*Priacanthus hamrur*	*Trapezium oblongum*
Caprella andreae	*Fenestrulina malusii*	*Mitromorpha columbellaria*	*Priacanthus sagittarius*	*Tremoctopus gracilis*

Caprella dilatata
Caprella equilibra
Caprella mutica
Caprella penantis
Caprella scaura
Carassius auratus
Carcharhinus brachyurus
Carcharhinus falciformis
Carcinus aestuarii
Carcinus maenas
Carinaria lamarckii
Carupa tenuipes
Cassiopea andromeda
Catenicella paradoxa
Caulibugula zanzibariensis
Cauloramphus spiniferum
Cellana rota
Celleporaria aperta
Celleporaria brunnea
Celleporaria fusca
Celleporaria labelligera
Celleporaria pilaefera
Celleporaria vermiformis
Celleporella carolinensis
Celleporella hyalina
Celleporina bitari
Celtodoryx ciocalyptoides
Centrocardita akabana
Centrolabrus exoletus
Centropristis striata
Cephalopholis argus
Cephalopholis nigri
Cephalopholis taeniops
Cephalothrix simula
Cerastoderma edule
Ceratonereis mirabilis
Ceratophyllum submersum
Cereus pedunculatus
Cerithidium diplax
Cerithidium perparvulum
Ferosagitta galerita
Festuca rubra
Ficopomatus enigmaticus
Filellum serratum
Finella pupoides
Fistularia commersonii
Fistularia petimba
Fistulobalanus albicostatus
Fistulobalanus pallidus
Flabellina rubrolineata
Fossarus eutorniscus
Fragilariopsis doliolus
Fucellia maritima
Fulvia (Fulvia) australis
Fulvia fragilis
Fundulus heteroclitus
Fusinus rostratus
Gafrarium pectinatum
Gafrarium savignyi
Galeocerdo cuvier
Galeus atlanticus
Gambusia affinis
Gambusia holbrooki
Gammarellus angulosus
Gammaropsis togoensis
Gammarus tigrinus
Gammogobius steinitzi
Gari pallida
Garveia franciscana
Gasterosteus aculeatus
Gemma gemma
Geodia micropunctata
Gephyroberyx darwinii
Geukensia demissa
Gibborissoia virgata
Gibbula albida
Glabropilumnus laevis
Glaucostegus halavi
Gloniella clavatispora
Glycera alba
Mizuhopecten yessoensis
Mnemiopsis leidyi
Mnestia girardi
Modiolus auriculatus
Modiolus barbatus
Moerisia carine
Moerisia inkermanica
Molgula citrina
Molgula manhattensis
Monalysidium acicularis
Monetaria annulus
Monocorophium acherusicum
Monocorophium insidiosum
Monocorophium sextonae
Monocorophium uenoi
Monopylephorus rubroniveus
Monotaxis grandoculis
Monotygma fulva
Monotygma lauta
Monotygma watsoni
Morone saxatilis
Mucropetraliella thenardii
Muggiaea atlantica
Mulinia lateralis
Muraenesox cinereus
Murchisonella mediterranea
Murex forskoehlii
Musculus coenobitus
Musculus viridulus
Mya arenaria
Mycteroperca fusca
Myicola ostreae
Myosotella myosotis
Myra subgranulata
Myriophyllum spicatum
Mytilicola intestinalis
Mytilicola orientalis
Mytilopsis leucophaeata
Mytilopsis sallei
Mytilus chilensis
Prionospio aucklandica
Prionospio depauperata
Prionospio krusadensis
Prionospio paucipinnulata
Prionospio pulchra
Prionospio pygmaeus
Prionospio saccifera
Prionospio sexoculata
Pristis pectinata
Proameira simplex
Proboscia indica
Procambarus clarkii
Proceraea cornuta
Procerastea halleziana
Procerolagena oceanica
Prokelisia marginata
Proterorhinus marmoratus
Protodorvillea biarticulata
Protodorvillea egena
Protoreaster nodosus
Psammacoma gubernaculum
Pseliodinium fusus
Pseudo-nitzschia australis
Pseudo-nitzschia calliantha
Pseudo-nitzschia delicatissima
Pseudo-nitzschia multistriata
Pseudo-nitzschia pseudodelicatissima
Pseudo-nitzschia pungens
Pseudo-nitzschia seriata
Pseudo-nitzschia subfraudulenta
Pseudobacciger harengulae
Pseudobiceros stellae
Pseudocalanus elongatus
Pseudoceros duplicinctus
Pseudochama corbierei
Pseudocyclops xiphophorus
Pseudodactylogyrus anguillae
Pseudodactylogyrus bini
Pseudodiaptomus marinus
Pseudodiaptomus trihamatus
Tretomphaloides clara
Tricellaria inopinata
Tricellaria ternata
Trichydra pudica
Triconia hawii
Triconia minuta
Triconia rufa
Triconia umerus
Tridentata marginata
Tridentiger barbatus
Tridentiger bifasciatus
Tridentiger trigonocephalus
Trididemnum savignii
Triloculinella asymmetrica
Trinectes maculatus
Tritia neritea
Trivirostra triticum
Trochus erithreus
Trochus radiatus
Trophonopsis alboranensis
Truncatella subcylindrica
Tryblionella punctata
Trypauchen vagina
Tubastraea coccinea
Tubificoides benedii
Tubificoides brownae
Tubificoides heterochaetus
Tubificoides pseudogaster
Tubulipora flabellaris
Turbonilla edgarii
Turritopsis dohrnii
Tylerius spinosissimus
Tylosurus choram
Tylosurus crocodilus crocodilus
Undatella quadrata
Upeneus moluccensis
Upeneus pori
Urocaridella pulchella
Urosalpinx cinerea
Vaginulinopsis sublegumen

Cerithiopsis pulvis	*Glycera capitata*	*Mytilus edulis*	*Pseudofabriciola filamentosa*	*Vanderhorstia mertensi*
Cerithiopsis tenthrenois	*Glycinde bonhourei*	*Mytilus galloprovincialis*	*Pseudofusus rostratus*	*Varicopeza pauxilla*
Cerithium columna	*Glycymeris arabica*	*Mytilus trossulus*	*Pseudohauerina diversa*	*Varicorbula gibba*
Cerithium egenum	*Glyphidohaptor plectocirra*	*Myxicola infundibulum*	*Pseudohauerinella dissidens*	*Variola louti*
Cerithium litteratum	*Gmelinoides fasciatus*	*Naineris quadraticeps*	*Pseudolachlanella slitella*	*Ventomnestia girardi*
Cerithium nesioticum	*Gobiosoma bosc*	*Naineris setosa*	*Pseudomassilina australis*	*Vexillum (Pusia) depexum*
Cerithium nodulosum	*Gobius cruentatus*	*Nanostrea fluctigera*	*Pseudomassilina reticulata*	*Victorella pavida*
Cerithium scabridum	*Godiva quadricolor*	*Naria turdus*	*Pseudominolia nedyma*	*Virgulinella fragilis*
Chaetoceros bacteriastroides	*Goneplax rhomboides*	*Nassa situla*	*Pseudomyicola spinosus spinosus*	*Virididentula dentata*
Chaetoceros coarctatus	*Goniadella gracilis*	*Nassarius arcularia*	*Pseudonereis anomala*	*Viriola corrugata*
Chaetoceros concavicornis	*Goniobranchus annulatus*	*Nassarius arcularia plicatus*	*Pseudopolydora antennata*	*Voorwindia tiberiana*
Chaetoceros convolutus	*Goniobranchus obsoletus*	*Nassarius concinnus*	*Pseudopolydora kempi*	*Watersipora arcuata*
Chaetoceros curvisetus	*Gonioinfradens paucidentatus*	*Naucrates ductor*	*Pseudopolydora paucibranchiata*	*Watersipora subatra*
Chaetoceros decipiens	*Gonionemus vertens*	*Navicula finmarchica*	*Pseudorasbora parva*	*Watersipora subtorquata*
Chaetoceros densus	*Gonothyraea loveni*	*Navicula schroeteri*	*Pseudorhaphitoma iodolabiata*	*Weinkauffia macandrewii*
Chaetoceros didymus	*Gouldiopa consternans*	*Naxotia attenuata*	*Pseudosolenia calcar-avis*	*Xanthias lamarckii*
Chaetoceros diversus	*Grandidierella japonica*	*Neanthes agulhana*	*Pseudotriloculina subgranulata*	*Xenostrobus securis*
Chaetoceros peruvianus	*Grapsus granulosus*	*Neanthes willeyi*	*Psiloteredo megotara*	*Xiphopenaeus kroyeri*
Chaetoceros rostratus	*Gregariella ehrenbergi*	*Necora puber*	*Pteragogus pelycus*	*Xiphophorus hellerii*
Chaetoceros simplex	*Guttigadus latifrons*	*Nematostella vectensis*	*Pteragogus trispilus*	*Xylophaga dorsalis*
Chaetoceros tortissimus	*Gyrodactylus mugili*	*Nemichthys scolopaceus*	*Pteria colymbus*	*Xylophaga praestans*
Chaetodipterus faber	*Gyrodactylus salaris*	*Nemipterus randalli*	*Pteria hirundo*	*Yoldia limatula*
Chaetodon austriacus	*Gyrodactylus zhukovi*	*Nemopsis bachei*	*Pterois antennata*	*Zafra exilis*
Chaetodon larvatus	*Halecium delicatulum*	*Neodexiospira brasiliensis*	*Pterois miles*	*Zafra savignyi*
Chaetogammarus ischnus	*Halgerda willeyi*	*Neodexiospira pseudocorrugata*	*Pterois volitans*	*Zafra selasphora*
Chaetogammarus trichiatus	*Halichoerus grypus*	*Neodexiospira steueri*	*Ptilohyale littoralis*	*Zebrasoma desjardinii*
Chaetogammarus warpachowskyi	*Halichondria (Halichondria) bowerbanki*	*Neogobius fluviatilis*	*Pulleniatina obliquiloculata*	*Zebrasoma flavescens*
Chaetopleura (Chaetopleura) angulata	*Halichondria (Halichondria) panicea*	*Neogobius gymnotrachelus*	*Pungitius platygaster*	*Zebrasoma xanthurum*
Chaetopleura angulata	*Haliclona (Haliclona) oculata*	*Neogobius melanostomus*	*Purpuradusta gracilis*	*Zenopsis conchifer*
Chaetozone corona	*Haliclona (Rhizoniera) indistincta*	*Neomoelleria cornuta*	*Purpuradusta gracilis notata*	*Zeuxo (Parazeuxo) coralensis*
Chalinula loosanoffi	*Haliclona (Soestella) xena*	*Neomysis americana*	*Pyrgo denticulata*	*Zeuxo coralensis*
Chama asperella	*Haliclona spinosella*	*Neopseudocapitella brasiliensis*	*Pyrgulina fischeri*	*Zopfiella latipes*
Chama chinensis	*Haliclona xena*	*Nephasoma (Nephasoma) eremita*	*Pyrgulina maiae*	*Zygochlamys patagonica*

Table 8. Conservation status of marine habitats in Europe. Habitats were classified as either threatened or of conservation importance. Documents or assessments used are the Habitat Directive (HD), Nature Restoration Law (NRL), OSPAR list of threatened habitats (OSP), HELCOM Red List (HEL), ICES Vulnerable Marine Ecosystems (IC), the EU Red List of habitats (EU-RL) and its extended version (EU-RL+).

Habitat	Document(s)
Conservation importance	
Anemone aggregations	IC
Baltic aphotic muddy sediment dominated by *Monoporeia affinis* and/or *Pontoporeia femorata*	HEL
Baltic aphotic muddy sediment dominated by meiofauna	HEL
Baltic aphotic rock and boulders or mixed hard and soft substrates dominated by sea anemones (Actiniarida)	HEL
Baltic aphotic rock and boulders or mixed hard and soft substrates dominated by sea squirts (Ascidiacea)	HEL
Baltic aphotic rock and boulders or mixed hard and soft substrates dominated by soft corals (Alcyonacea)	HEL
Baltic aphotic rock and boulders or mixed hard and soft substrates dominated by stone corals (Scleractinida)	HEL
Baltic aphotic rock and boulders or mixed substrates dominated by sponges (Porifera)	HEL
Baltic aphotic sand dominated by striped venus (*Chamelea gallina*)	HEL
Baltic photic muddy sediment dominated by Unionidae	HEL
Baltic photic muddy sediment dominated by ocean quahog (*Arctica islandica*)	HEL
Baltic photic muddy sediment or sand dominated by spiny naiad (*Najas marina*)	HEL
Baltic photic muddy sediment, coarse sediment, sand or mixed substrate dominated by common eelgrass (*Zostera marina*)	HEL
Baltic photic or aphotic coarse sediment dominated by multiple infaunal polychaete species including *Ophelia* spp. Baltic photic or aphotic sand dominated by multiple infaunal polychaete species including *Ophelia* spp. and *Travisia forbesii*	HEL
Baltic photic or aphotic coarse sediment or sand dominated by multiple infaunal bivalve species: *Macoma calcarea*, *Mya truncata*, *Astarte* spp., *Spisula* spp.	HEL
Baltic photic or aphotic rock and boulders or mixed substrate dominated by erect moss animals (*Flustra foliacea*)	HEL
Baltic photic or aphotic shell gravel characterized by mixed infaunal macrocommunity in fine sand-like shell fragments	HEL
Baltic photic sand dominated by ocean quahog (*Arctica islandica*)	HEL
Baltic photic shell gravel dominated by kelp	HEL
Bryozoan patches	IC
Carbonate mounds	OSP
Cold-water coral reef	IC
Coral gardens	OSP, IC
Cymodocea meadows	OSP
Deep-sea sponge aggregations	OSP
Haploops habitat	OSP
Hard-bottom anemone aggregations	IC
Hard-bottom coral garden: Colonial scleractinians on rocky out-crops	IC
Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens	IC
Hard-bottom coral garden: Non-reefal scleractinian aggregations	IC
Hard-bottom coral garden: Stylasterid corals on hard substrata	IC
Hard-bottom sponge aggregations	IC

Hydrothermal vents/fields	IC
Intertidal Mytilus edulis beds on mixed and sandy sediments	OSP
Kelp forests	OSP
Littoral chalk communities	OSP
Lophelia pertusa reefs	OSP
Lophelia pertusa/Madrepora oculata reef	IC
Maerl beds	OSP
Modiolus modiolus beds	OSP
Ostrea edulis beds	OSP
Sabellaria spinulosa reefs	OSP
Sea-pen and burrowing megafauna communities	OSP
Sea-pen fields	IC
Seamounts	OSP
Soft-bottom anemone aggregations	IC
Soft-bottom coral garden: Cauliflower Coral Fields	IC
Soft-bottom coral garden: Cup-coral fields	IC
Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens	IC
Soft-bottom sponge aggregations	IC
Solenosmilia variabilis reef	IC
Zostera beds	OSP
Threatened	
Algal dominated communities in the Mediterranean infralittoral sediment	EU-RL, EU-RL+
Atlantic maerl beds	EU-RL, EU-RL+
Baltic Sea aphotic pelagic below halocline oxic	HEL
Baltic aphotic hard clay dominated by *Astarte* spp.	HEL
Baltic aphotic muddy sediment characterized by sea-pens	HEL
Baltic aphotic muddy sediment dominated by *Astarte* spp.	HEL
Baltic aphotic muddy sediment dominated by *Haploops* spp.	HEL
Baltic aphotic muddy sediment dominated by ocean quahog (*Arctica islandica*)	HEL
Baltic aphotic sand dominated by ocean quahog (*Arctica islandica*)	HEL
Baltic photic and aphotic maërl beds (unattached particles of coralline red algae)	HEL
Baltic photic mixed substrate, mud, coarse sediment or sand dominated by stable aggregations of unattached *Fucus* spp. (dwarf form)	HEL
Baltic photic or aphotic shell gravel dominated by vase tunicate (*Ciona intestinalis*)	HEL
Biogenic habitats of Mediterranean mediolittoral rock	EU-RL, EU-RL+
Boreal Baltic coastal meadows	HD, NRL
Boreal Baltic narrow inlets	HD, NRL, HEL
Boreal Baltic sandy beaches with perennial vegetation	HD, NRL
Estuaries	HD, NRL, HEL
Fucales and other algae on Pontic sheltered upper infralittoral rock, well illuminated	EU-RL, EU-RL+
Infaunal communities in Baltic upper circalittoral coarse sediment and shell gravel dominated by bivalves	EU-RL, EU-RL+
Infaunal communities of Baltic upper circalittoral muddy sediment dominated by bivalves	EU-RL, EU-RL+
Infaunal communities on Baltic infralittoral shell gravel	EU-RL, EU-RL+

Invertebrate-dominated Pontic circalittoral rock	EU-RL, EU-RL+
Macaronesian communities of eulittoral rock moderately exposed to wave action	EU-RL, EU-RL+
Macaronesian communities of lower eulittoral rock sheltered from wave action	EU-RL, EU-RL+
Mediterranean infralittoral mussel beds	EU-RL, EU-RL+
Mediterranean infralittoral oyster beds	EU-RL, EU-RL+
Mediterranean salt meadows (*Juncetalia maritimi)*	HD, NRL
Mediterranean salt steppes (*Limonietalia*)	HD, NRL
Mussel beds in the Atlantic littoral zone	EU-RL, EU-RL+
Mussel beds on Pontic circalittoral terrigenous muds	EU-RL, EU-RL+
Photophilic communities dominated by calcareous, habitat-forming algae	EU-RL, EU-RL+
Photophilic communities with canopy-forming algae in Mediterranean infralittoral and upper circalittoral rock	EU-RL, EU-RL+
Polychaete/bivalve-dominated mid-estuarine Atlantic littoral mud	EU-RL, EU-RL+
Polychaete/oligochaete-dominated upper estuarine Atlantic littoral mud	EU-RL, EU-RL+
Pontic circalittoral biogenic detritic bottoms with dead or alive mussel beds, shell deposits, with encrusting corallines (*Phymatolithon*, *Lithothamnion*) and attached foliose sciaphilic macroalgae	EU-RL, EU-RL+
Pontic infralittoral sands and muddy sands with stable aggregations of perennial unattached macroalgae	EU-RL+
Pontic mediolittoral caves and overhangs	EU-RL
Posidonia beds (*Posidonion oceanicae*)	HD
Posidonia beds in the Mediterranean infralittoral zone	HD, NRL, EU-RL, EU-RL+
Salicornia and other annuals colonizing mud and sand	HD, NRL
Sandbanks which are slightly covered by sea water all the time	HD, NRL, HEL
Seagrass beds on Atlantic infralittoral sand (Macaronesian)	EU-RL, EU-RL+
Seagrass beds on Atlantic infralittoral sand (non-Macaronesian)	EU-RL, EU-RL+
Seagrass meadows in Pontic lower infralittoral sands	EU-RL, EU-RL+
Sparse epibenthic community of Baltic upper circalittoral muddy sediment	EU-RL, EU-RL+

Figures

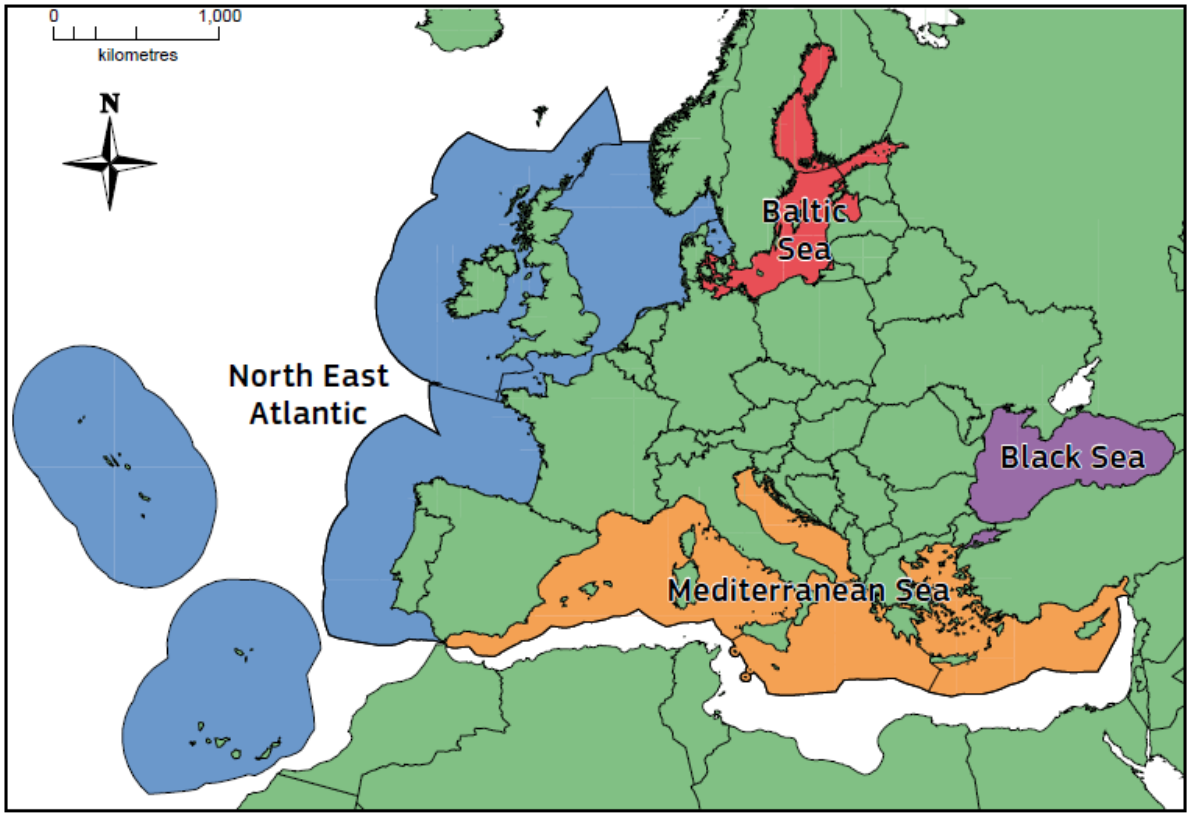

Figure 1. Marine assessment areas (shaded) and regional sea groupings for the European Red List of Habitats (note that, within these boundaries, habitats below 200 m depth and pelagic habitats were not assessed) (from European Commission et al. 2016; Figure 1.1).

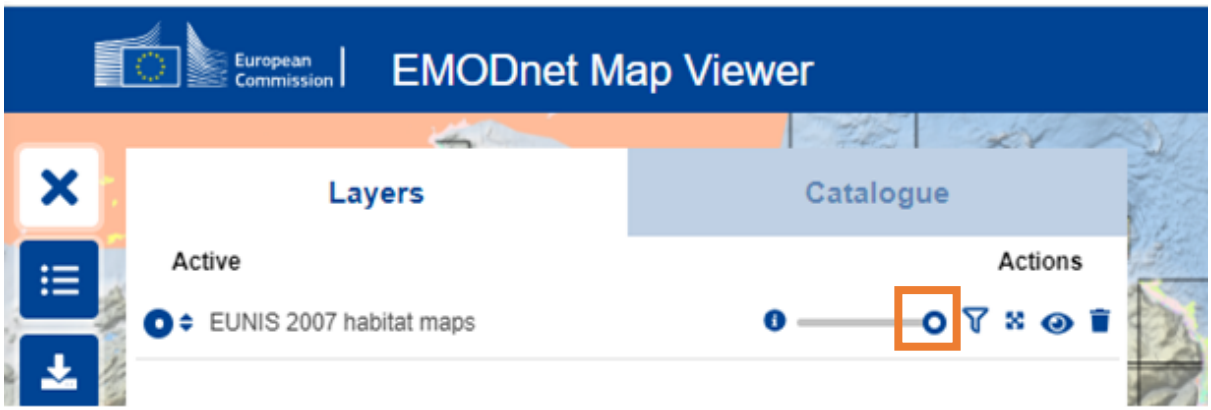

Figure 2. Some layers on the EMODnet Map Viewer can be filtered by various attributes by clicking on the icon shown in the orange box.

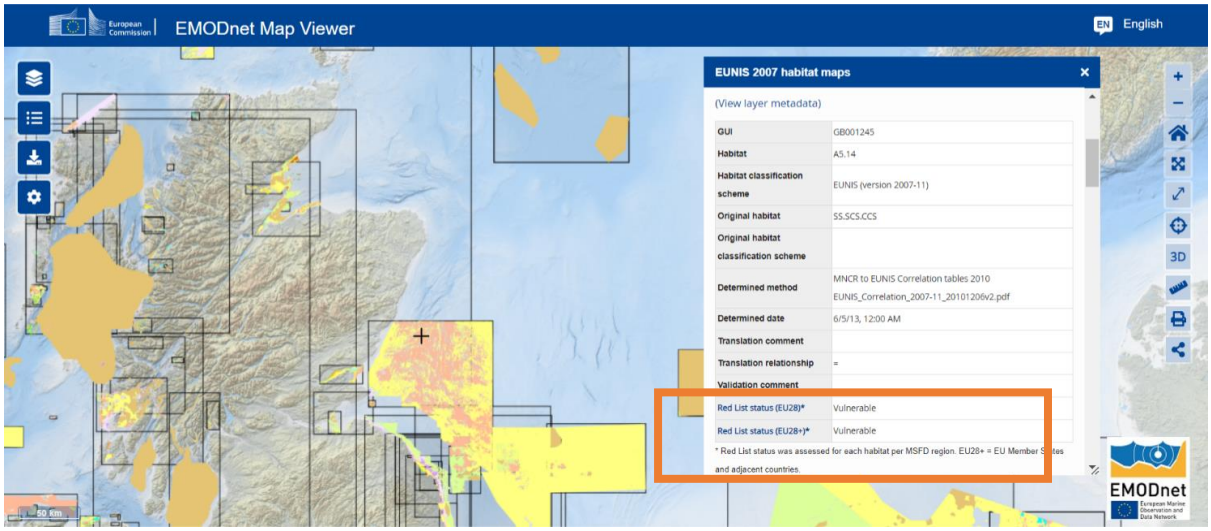

Figure 3. The Red List conservation status is now presented alongside the habitat and other information about the habitat map for all EUNIS 2007 habitat maps – as highlighted in the orange rectangle.

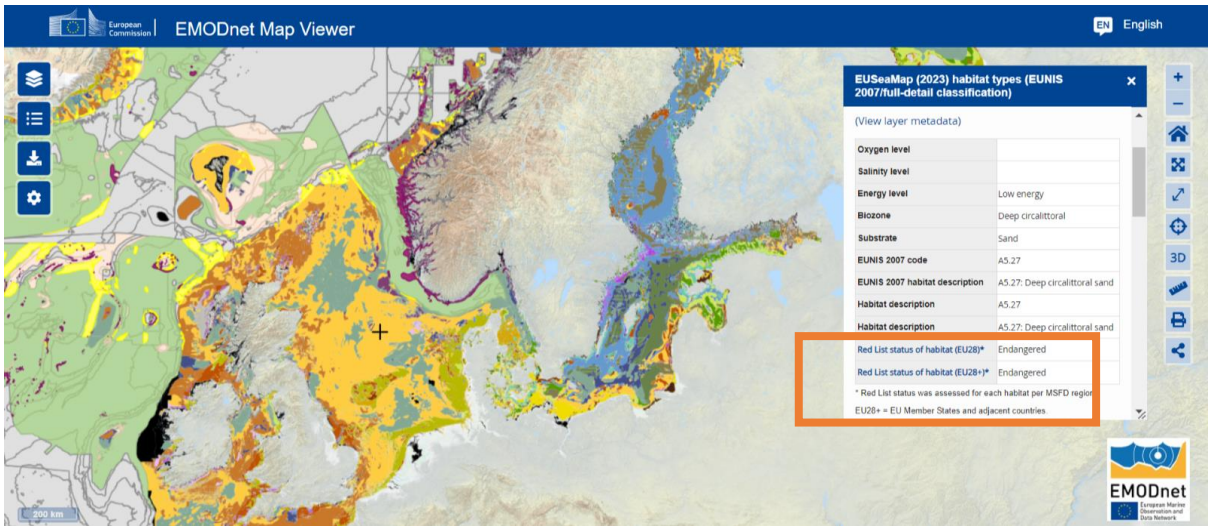

Figure 4. The Red List conservation status is now presented alongside the habitat within the EMODnet broad-scale seabed habitat map for Europe (EUSeaMap) layer – as highlighted in the orange rectangle.

Supplementary Material

The following files are available in a zip folder *MPA Europe_Deliverable 3.4_Supplementary Materials*:

MPAEU_D3_4_threatened_species_list.csv
MPAEU_D3_4_threatened_species_fulltaxonomy.csv
MPAEU_D3_4_threatened_species_README.csv
MPAEU_D3_4_invasive_species_list.csv
MPAEU_D3_4_invasive_species_README.csv
MPAEU_D3_4_threatened_habitats_list.csv
MPAEU_D3_4_threatened_habitats_README.csv
MPAEU_D3_4_EUNIS-RedList-lookup.xlsx

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