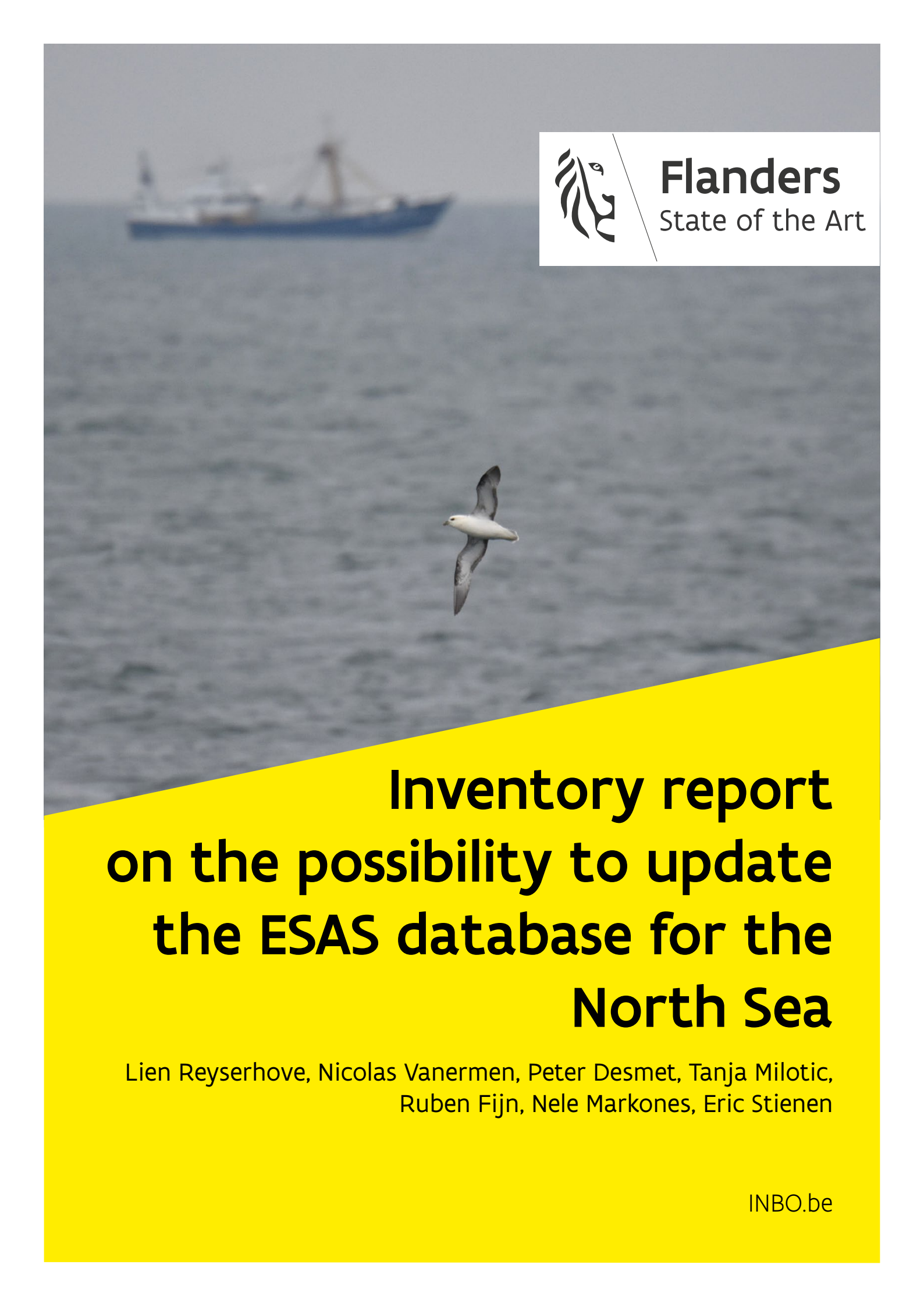




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# **Inventory report on the possibility to update the ESAS database for the North Sea**

Lien Reyserhove, Nicolas Vanermen, Peter Desmet, Tanja Milotic,  
Ruben Fijn, Nele Markones, Eric Stienen

INBO.be

**Authors:**

[Lien Reyserhove](#) , [Nicolas Vanermen](#) , [Peter Desmet](#) , [Tanja Milotic](#) , [Ruben Fijn](#) ,  
Nele Markones, [Eric Stienen](#) 

*Research Institute for Nature and Forest (INBO)*

**Reviewers:**

Dimitri Brosens, Marc Pollet

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**Location:**

INBO vestiging Herman Teirlinck  
Havenlaan 88, 1000 Brussel  
[www.inbo.be](http://www.inbo.be)

**e-mail:**

[lien.reyserhove@inbo.be](mailto:lien.reyserhove@inbo.be)

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# INVENTORY REPORT ON THE POSSIBILITY TO UPDATE THE ESAS DATABASE FOR THE NORTH SEA

**Lien Reyserhove, Nicolas Vanermen, Peter Desmet, Tanja Milotic, Ruben Fijn,  
Nele Markones, Eric Stienen**

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## Abstract

This inventory report presents the results of the questionnaire set up to identify the existing 'seabirds at sea' (SAS) programmes collected in the OSPAR and HELCOM areas. For each country and SAS programme, we discuss the specific content and the potential constraints for future integration in the central ESAS database. We can conclude that data quality aspects (language use, update frequency, data format) allow for future migration. Only 8% of the respondents indicated to have financial constraints for sharing data, although one third indicated not to know. The legal aspects to the mobilization are considered to be the largest hindrance: almost half of the respondents indicated to have legal objections for sharing monitoring data. These results were discussed in a joint workshop and led to the conclusion that a joint international effort is essential to work towards a central ESAS database, which will automatically benefit the monitoring and research of seabirds in the North Sea.



**Recommendations for management and/or policy**

This report is an important step towards an improved monitoring and research in the North Sea. Joint international effort is essential, and will allow for:

- better status assessments and trend analysis reporting,
- Environmental Impact Assessments (EIA) for marine industries,
- vulnerability and habitat suitability mapping,
- marine spatial planning and the designation of Marine Protected Areas,
- the identifications of management needs for internationally protected species,
- filling in knowledge gaps on seabird ecology.

Further involvement of each country is key. We therefore recommend to:

- install a network of delegates, with one or two representatives from each country who are involved in marine monitoring,
- approve a data sharing agreement on the details and level of public availability, which will enable a smooth data exchange,
- coordinate this network by a central steering committee, to facilitate a smooth and continuous transition of data to the database,
- make the ESAS methodology and standards as mandatory as possible in each country,
- focus on national and international survey scheme data and not too much on data from private companies





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# 1 INTRODUCTION

A general lack of detailed quantitative knowledge on seabird distribution at sea was identified in the late 1970s. To share knowledge between seabird researchers, the *European Seabirds at Sea (ESAS) database* was established in 1991 as a collaboration between individuals and institutes who had collected data on the distribution of seabirds and marine mammals in north-west European offshore areas. In this database, distribution data of seabirds at sea (SAS data) and marine mammals were regularly added for over 25 years. The data were collected according to a **standardised methodology**, mostly during ship-based surveys in the North Sea basin. The most recent version of the ESAS database contains over two million records collected during ship-based and aerial surveys since 1979. The shared ESAS database has been managed by the Joint Nature Conservation Committee (JNCC) on behalf of the ESAS coordinating group. The JNCC is currently presenting distributional data of Seabirds at Sea (SAS) through the online Ocean Biogeographic Information System (OBIS) Seamap project (<https://seamap.env.duke.edu/dataset/427>). The OBIS database currently holds a subset of the ESAS database from the years ca. 1979 to ca. 2000. In addition, the Joint OSPAR/HELCOM/ICES Working Group on Seabirds (JWGBIRD) has plans to relocate the hosting and maintenance of the ESAS database to the International Council for the Exploration of the Sea (ICES) Data Centre and to be managed by a subgroup from JWGBIRD.

Unfortunately, the ESAS database **has not been updated in the last decade**, despite the fact that SAS surveys were continued to be carried out (ship-based counts as well as aerial surveys) by many different organisations. In the current project, “Inventory report on revitalizing the ESAS-database for the North Sea”, issued by Rijkswaterstaat (RWS, the Netherlands) an update of the existing ESAS database with recent data is prepared as well as the migration of the database from the JNCC to the ICES Data Centre.

In *Work package 1*, *the possibility to update the ESAS database with recent data* is explored. This relies on knowing the extent of the current ESAS database (version 5) and more importantly identifying data sources holding recent data of ESAS partners that have not yet been added to the database as well as survey programmes that are not yet included in ESAS at all. In order to make an inventory of existing data sources, a questionnaire was sent out to the JWGBIRD consortium and additional researchers engaged in SAS research. The questionnaire was designed to identify the diverse sources of SAS data in Europe, in addition to the datasets that have previously been identified by the JWGBIRD consortium, and to investigate which datasets and monitoring programmes are suitable for inclusion in the ESAS database at a later stage.







## 4 RESULTS

### 4.1 GENERAL FINDINGS

Our questionnaire identified **48 monitoring programmes** (one monitoring programme = one dataset in this text), associated with 34 organizations. Two organizations, Natural Power (Ireland, one programme) and the Dansk Marine Observers ApS (Denmark, one programme) did not share the requested information at the present time. Additionally, the Institute of Geography (Russian Federation, one programme) and the Bangor University (United Kingdom, one programme) indicated not to hold SAS data. This resulted in a total of 30 organizations involved in 44 SAS programmes successfully completing the questionnaire (Figure 1, Table 1). The overall purpose of these programmes is to monitor abundance and distribution of birds and marine mammal biodiversity on a regular basis, with some programmes specifically focusing on the impact of offshore wind farms, fisheries or ports.

### 4.2 DATA COMPATIBILITY FOR INCLUSION IN ESAS

All five OSPAR regions (<https://www.ospar.org/convention/the-north-east-atlantic>) are covered by the identified programmes, of which almost half of the programmes include the greater North Sea (OSPAR Region II) (n = 19, 43%) (Table 2). The HELCOM areas (<https://en.wikipedia.org/wiki/HELCOM>) are covered by 14 datasets (31%). All programmes include birds into their surveys, but 50% (n = 22) of them also focus on the monitoring of marine mammals. The monitoring programmes vary markedly with respect to dataset size, temporal scope, and observation platform.

Table 1 Overview of the 44 SAS monitoring programmes collected by the questionnaire, with the programme ID (generated), country, organization of respondent and programme name.

<b>Programme ID</b>	<b>Country</b>	<b>Organization</b>	<b>Programme name/acronym</b>
FIN-SYKE	Finland	Finnish Environment Institute (SYKE)	National offshore seabird monitoring programme on wintering birds
FIN-MNH	Finland	Metsähallitus Nature and Heritage	Archipelago Bird Census Monitoring
EST-EMU	Estonia	Estonian University of Life Sciences (EMU)	Aerial survey of seabirds in Estonian waters
EST-EOS	Estonia	BirdLife Estonia (EOS)	
LVA-GOR	Latvia	Latvian Ornithological Society (LOB)	The Gulf of Riga as a Resource for Wind Energy (GORWIND)
LVA-LIFE05	Latvia	Latvian Ornithological Society (LOB)	LIFE project (LIFE05 NAT/LV/000100)
LVA-MAR	Latvia	Latvian Ornithological Society (LOB)	MARMONI
LVA-WWAS	Latvia	Latvian Ornithological Society (LOB)	Survey of wintering waterbirds at sea







Table 2 Programme specifics: temporal scope (blue: active programme), number of occurrences, geographical focus: OSPAR region (I: Arctic waters , II: Greater North Sea, III: Greater North Sea, IV: Bay of Biscay and Iberian Coast, empty if not applicable) or Baltic Sea (yes if sampling in Baltic Sea, empty if not applicable), Marine mammals (yes if programme includes marine mammals monitoring), and platform: Plane (yes if aerial observations) and Ship (yes if observations by boat).

Programme ID	Temporal scope	Nr of occurrences	OSPAR region	Baltic Sea	Marine mammals	Plane	Ship
FIN-SYKE	1996-now	100K-1M		yes		yes	yes
FIN-MNH	1980-now	100K-1M		yes			yes
EST-EMU	2016-now	10K-100K		yes		yes	
EST-EOS	2006-now	10K-100K		yes			yes
LVA-GOR	2011-2012	1-10K		yes		yes	
LVA-LIFE05	2005-2008			yes			yes
LVA-MAR	2011-2014	10K-100K		yes		yes	yes
LVA-WWAS	2016-now	10K-100K		yes		yes	
LTU	2006-2008	10K-100K		yes			yes
RUS	2018-2018	1-10K		yes		yes	
POL-MZPM	2011-now	100K-1M		yes			yes
SWE	2004-now	10K-100K	II	yes		yes	
DNK	2004-now	100K-1M	II	yes		yes	
DEU-BSH	2000-now		II	yes	yes	yes	yes
DEU-GMBM	2008-now		II		yes	yes	yes
DEU-OSMS	2004-now		II			yes	yes
DEU-SAS	1990-now		II		yes	yes	yes
NOR-NINA	2004-now	>1M	I		yes		yes
NLD-BuWa-AIR	2004-now	100K-1M	II		yes	yes	
NLD-BuWa-SHIP	2004-now	10K-100K	II		yes		yes
NLD-MWTL	1991-now	100K-1M	II		yes	yes	
NLD-NIOZ	1985-now	>1M	I,II,IV,V				yes
NLD-WUR	1980-now		I, II, III, IV		yes		yes
BEL-INBO	1992-now	100K-1M	II		yes		yes
BEL-RBINS	2008-now	1-10K	II		yes	yes	
GBR-HIDEF	2011-now	>1M	II,III		yes	yes	
GBR-JNCC	1980-now		II,III		yes	yes	yes
GBR-OWF	2004-2016	10K-100K	II		yes		yes







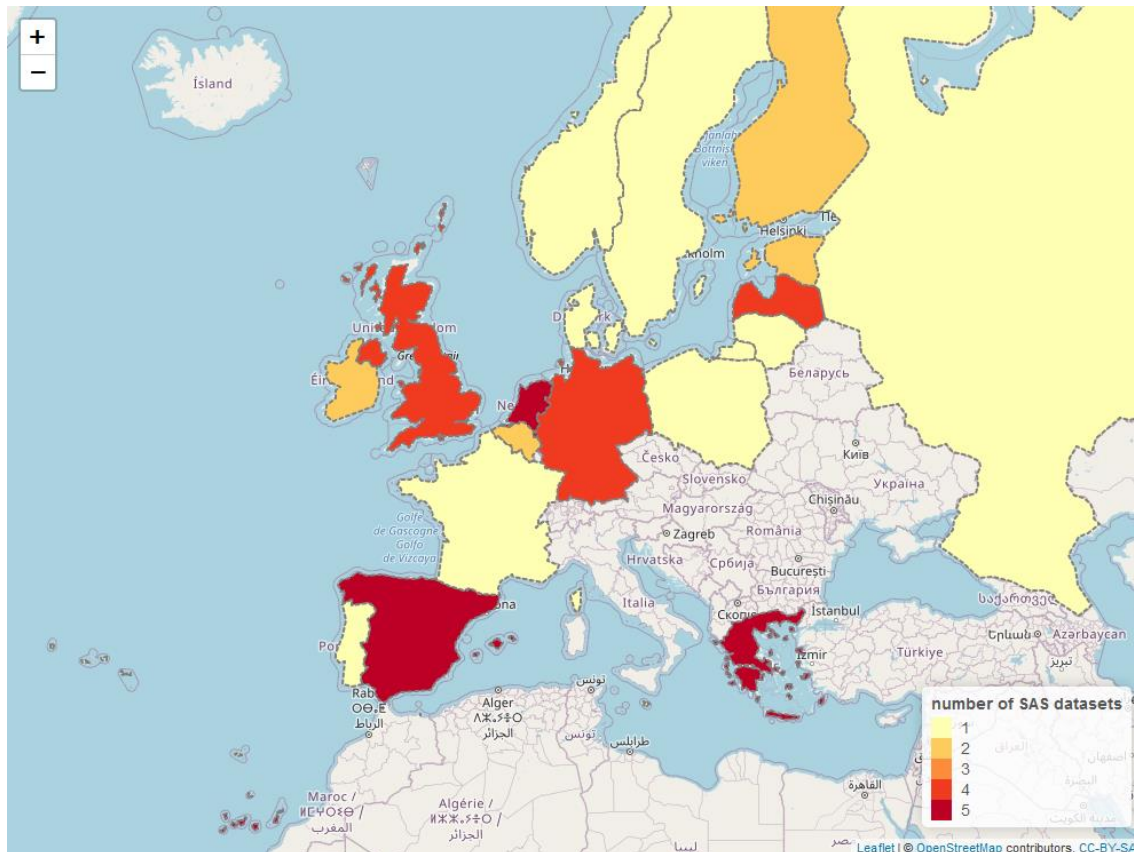


Figure 1 Map with number of SAS monitoring programmes per country. One (out of three) SAS programmes in Ireland and one (out of two) SAS programmes in Denmark are not included, as they were not allowed to share information.

We identified three main data quality aspects that could hinder the unification of the identified programmes into a single ESAS v6 database: language use, data update frequency and data storage. Most fields in the ESAS v5 database are encoded, except the remark field, which contains full text. Thus, different language use in these remark fields should not be a big problem. For each active programme, data updates into the local data management system takes place one year after field sampling at the latest, meaning that all active datasets are kept up to date. Some of the datasets are managed in a structured file such as a comma separated file (11%) or Excel file (52%), some are held in a relational database such as Microsoft Access (34%), SQL or Postgres (22%) or Paradox (11%). Some datasets are stored as shapefiles (4%) or in a GIS database (2%) Most data are stored in multiple systems. We can conclude that there are *no main issues with respect to language use, update frequency or data storage that could obstruct future integration into a single ESAS database.*

Dataset content quality was assessed using two criteria: (1) current inclusion in the ESAS database and (2) sampling methodology. Programmes already or partially included in the ESAS database ( $n = 10$  or 22%) already use the correct protocol and are considered to be of sufficient quality (Table 3). Ship-based observations are considered to be of high quality if they are generated by using (1) distance estimation methods combined with (2) snapshot counts for flying birds. For aerial observations also, the method (both line or strip transects) should make use of distance sampling methods. Based on this definition, *four of the five Spanish programmes* (ESP-AV3, ESP-PEL, ESP-JUV and ESP-BIO) and the Lithuanian programme (LTU) were identified to *potentially contain low quality data.* These ship-based programmes did not

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use snapshot counts for flying birds as a methodology or did not use distance estimation. Two programmes, *the Finnish National offshore seabird monitoring programme on wintering birds* (FIN-SYKE) and the *French MEGASCOPE programme* (FRA) combine *lower quality ship-based* (no snapshot count for flying birds) *data with higher quality aerial data*. For the Finnish Archipelago Bird Census Monitoring (FIN-MNH) programme, no information on these specific sampling methodologies is available and as such, data quality could not be assessed.

### 4.3 CONSTRAINTS FOR SHARING DATA

Out of the 44 identified ESAS programmes, *only three are fully integrated in the ESAS v5 database*: the British Seabirds at Sea programme led by the Joint Nature Conservation Committee (GBR-JNCC), the SAS programme led by Wageningen Marine Research (NLD-WUR) and the “monitoring van de Waterstaatkundige Toestand des Lands (MWTL), zeevogels” programme carried out by Bureau Waardenburg (NLD-MWTL) and commissioned by Rijkswaterstaat. However, recent updates are missing for the GBR-JNCC and MWTL programmes. To date, almost half of the programmes have not yet been included in the database (n = 21, 48%), eight of them are partially integrated (18%) and for four datasets (9%), integration has been planned.

A *large proportion* (75%, n = 33) of the respondents indicated to be *interested in sharing their SAS data*. None of the organizations was unwilling to share their data: the other 25% (n = 11) indicated not to know if sharing their SAS data is allowed. The *legal aspect* will be the *largest hurdle* for sharing the data: almost half (n = 20) of the respondents indicated to have legal objections for sharing monitoring data. In most of these cases, the data is owned by third parties (private companies or commissioners) and thus mobilization towards a single ESAS database should be authorized first. Others indicated that the legal conditions for sharing data differ between subsets of the data and should thus be considered for each case separately. In this respect, it is important to note that the data sharing agreement imposed by ICES allows data providers to choose between public and restricted access for (subsets of) their share of the data. The data sharing agreement specifications will be clearly communicated among all potential and current data providers and owners.

Another obstacle is *ownership and attribution*: ownership flags need to be maintained and appropriately credited. For almost half (48%, n = 21) of the monitoring programmes, no financial constraints were identified, although 34% (n = 15) indicated not to know. The remaining 8% indicated to have financial constraints for sharing the data, with costs estimated between 2.500 and 8.000 euro.

Table 3 Inclusion of programmes in the current ESAS v5 database, sharing interest with respect to future mobilization to ESAS v6 database and the financial and legal constraints for sharing.

Programme ID	Inclusion ESAS DB	Sharing interest	financial constraints	legal constraints
FIN-SYKE	Unknown	Yes	No	No
FIN-MNH	No	Unknown	Unknown	Yes
EST-EMU	Partially	Yes	Unknown	Yes
EST-EOS	No	Yes	Unknown	Yes
LVA-GOR	No	Yes	Yes	Unknown

Programme ID	Inclusion ESAS DB	Sharing interest	financial constraints	legal constraints
LVA-LIFE05	Unknown	Yes	No	No
LVA-MAR	No	Unknown	Unknown	Unknown
LVA-WWAS	Planned	Yes	Unknown	Yes
LTU	Unknown	Yes	No	No
RUS	No	Unknown	No	No
POL-MZPM	No	Yes	Unknown	Unknown
SWE	Planned	Yes	Yes	Yes
DNK	No	Unknown	Unknown	Unknown
DEU-BSH	No	Unknown	Unknown	Yes
DEU-GMBM	Partially	Yes	No	Yes
DEU-OSMS	Partially	Unknown	No	Unknown
DEU-SAS	Partially	Yes	No	Yes
NOR-NINA	No	Yes	No	No
NLD-BuWa-AIR	No	Yes	Yes	Yes
NLD-BuWa-SHIP	Unknown	Yes	Yes	Yes
NLD-MWTL	Planned	Yes	No	No
NLD-NIOZ	Partially	Yes	No	Yes
NLD-WUR	Yes	Yes	No	Yes
BEL-INBO	Partially	Yes	No	Yes
BEL-RBINS	No	Unknown	No	Yes
GBR-HIDEF	No	Yes	No	Yes
GBR-JNCC	Yes	Yes	No	No
GBR-OWF	No	Unknown	Unknown	Unknown
GBR-SFF	No	Unknown	Unknown	Unknown
IRL-NPWS-1	Partially	Yes	Unknown	Yes
IRL-NPWS-2	Unknown	Yes	Unknown	Unknown
FRA	Unknown	Yes	No	Yes
ESP-AV3	No	Unknown	Unknown	Unknown
ESP-BIO	No	Yes	Yes	Yes
ESP-JUV	No	Yes	Yes	Yes
ESP-PEL	No	Yes	Unknown	Unknown
ESP-UCA	Planned	Unknown	Unknown	Yes



Programme ID	Inclusion ESAS DB	Sharing interest	financial constraints	legal constraints
PRT	Partially	Yes	No	No
GRC-HSP	No	Yes	No	Unknown
GRC-LIFE03	Unknown	Yes	No	Unknown
GRC-LIFE07	Unknown	Yes	No	Unknown
GRC-LIFE96	Unknown	Yes	No	Unknown
GRC-MSFD	No	Yes	Yes	Unknown
MLT	No	Yes	Yes	Unknown

#### 4.4 FUTURE PERSPECTIVES

On March 25<sup>th</sup> 2021, an ESAS database workshop was organized by RWS to:

- present the results outlined in this inventory report
- discuss on the potential use of an updated ESAS database
- explore the way forward

This workshop was attended by representatives from the United Kingdom, Belgium, the Netherlands, France and BirdLife International.

*It was concluded that a joint international effort is essential to improve monitoring and research in the North Sea*, with the HELCOM approach on joint seabird monitoring as the main example. This will benefit status assessments and trend analysis reporting, Environmental Impact Assessments (EIA) for marine industries, vulnerability and habitat suitability mapping, marine spatial planning and the designation of Marine Protected Areas, the identification of management needs for internationally protected species and filling in knowledge gaps on seabird ecology. For this, involvement of each country is key. The idea was launched to install a network of delegates, with one or two representatives from each country who are involved in marine monitoring. The setup of such a network could act as an incentive for uploading data to the central ESAS database. This network would preferably be coordinated by a central steering committee, to facilitate a smooth and continuous transition of data to the database. This would however require funding, so possibilities will be explored to apply for funding on a EU scale. The need for standardized monitoring was recognized. It was suggested to make the ESAS methodology and standards as mandatory as possible in each country. With respect to the migration of historical data to the ESAS database, it was further suggested to focus on national and international survey scheme data and not too much on data from private companies.



## 5 MONITORING PROGRAMMES PER COUNTRY

The following section gives an overview of the specifics for each monitoring programme, grouped by country. For each monitoring programme, we discuss the specific goal, timeframe, geographical and taxonomic focus and dataset size (number of species occurrence records), complemented with information on the current integration in the ESAS v5 database and the potential financial and legal objections for integration in the updated ESAS v6 database. As discussed earlier in this report, data quality allows in almost all cases for inclusion in the ESAS database. When problems are expected with respect to data quality, we indicate this specifically in the text below.

### 5.1 FINLAND

Finland currently has two active seabird programmes: the National offshore seabird programme and the Archipelago Bird Census Monitoring.

#### 5.1.1 National offshore seabird programme (FIN-SYKE)

The Finnish Environment Institute (SYKE) has been leading the national offshore seabird monitoring programme since 1996. The programme comprises aerial surveys (every four years) that cover the regularly ice-free areas during winter. Four monitoring routes in the Åland Sea and Archipelago Sea are annually covered by ship. Three of the routes have been covered yearly since 1996. The fourth route is placed in the middle of the Archipelago Sea along the ship. The programme focuses on birds only and generated between 100,000 and 1 million records. There's an interest to share the data, no legal or financial constraints for the mobilization were identified.

**Contact person:** Markku Mikkola-Roos

#### 5.1.2 The Archipelago Bird Census Monitoring (FIN-MNH)

The Archipelago Bird Census Monitoring programme has been led by Metsähallitus Nature and Heritage since 1980. The programme was set up to monitor the abundance of breeding birds on islands in Finnish archipelago and is ship-based. The programme generated between 100,000 and 1 million records which have not been included in the current ESAS database yet. It is unknown whether the data will be shared in the future or whether financial constraints obstruct the mobilization. The data can only be shared without point coordinates, e.g. in 50 km squares.

**Contact person:** Antti Below

### 5.2 ESTONIA

Estonia is involved in two ongoing SAS programmes in the Baltic Sea.

#### 5.2.1 Aerial survey of seabirds in Estonian waters (EST-EMU)

The Estonian University of Life Sciences (EMU) is currently performing aerial surveys on the winter distribution of seabirds in Estonian coastal waters. This survey started in 2016 and is

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scheduled once every four year. The dataset includes between 10,000 and 100,000 records, from which a part is included in the current ESAS v5 database. Although EMU is interested in sharing their SAS data, the legal conditions for the mobilizations of the data should be specified by the Environmental Board of Estonia.

**Contact person:** Leho Luigujõe

**5.2.2 Monitoring by BirdLife Estonia (EST-EOS)**

Year-round, ship-based counts have been performed in the Baltic Sea by BirdLife Estonia since 2006, which generated between 10,000 and 100,000 records. These data are currently not available in the ESAS database, though BirdLife Estonia expressed to be willing to share their data. No financial constraints were specified. However, as other organizations are involved in the censuses, the sharing conditions would need to be negotiated with the owners on a case-by-case basis.

**Contact person:** Andrus Kuus

**5.3 LATVIA**

Latvia currently has one ongoing and two completed SAS programmes carried out by the Latvian Ornithological Society, with a specific focus on the Baltic Sea. None of these programmes are currently included in the ESAS v5 database.

**5.3.1 The GORWIND programme (LVA-GOR)**

The GORWIND project started in 2011 and lasted for one year. The project was set up to provide decision makers and potential developers of wind farms in the Gulf of Riga with reliable marine wind information from high resolution remote sensing data, coastal wind measurements and ensemble of regional climate models. Furthermore, information on habitat area for seals, wintering, migrating and breeding birds was collected. The database of the programme includes up to 10,000 records. The data owners are interested to share their data. Although financial constraints for the mobilization were identified, no specific costs were mentioned. Whether or not the legal aspect will be an issue is unknown.

**Contact person:** Ainars Aunins

**5.3.2 The Baltic MPAs programme (LVA-LIFE05)**

The LIFE project “Baltic MPAs - Marine protected areas in the Eastern Baltic Sea” (LIFE05 NAT/LV/000100, 2005-2008) aimed to contribute to the protection and sustainable use of marine biodiversity in the coastal and offshore waters of Estonia, Latvia and Lithuania. The sampling was ship-based and focused on birds only. There’s an interest to share the data, no financial or legal constraints for mobilization were identified.

**Contact person:** Antra Stīpniece

**5.3.3 The MARMONI programme (LVA-MAR)**

The MARMONI project was set up in 2011 and was rolled out in four different countries: Latvia, Estonia, Sweden and Finland. The goal of this project was to monitor the state of marine biodiversity by developing indicators for monitoring and assessment of marine biodiversity, conservation status of species and habitats, as well as impacts of human activities

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in the Baltic Sea. The programme ended in 2014. Sampling was carried out by airplane and/or ship. The project generated between 10,000 and 100,000 records. No financial nor legal objections for the mobilization were specified.

**Contact person:** Ainars Aunins

#### **5.3.4 Survey on wintering Seabirds at Sea (LVA-WWAS)**

The Latvian Nature Conservation Agency is the national authority for organizing surveys on wintering seabirds in the Baltic Sea, Latvia. The surveys are carried out by subcontractors. So far, all actual aerial surveys have been carried out by the Latvian Ornithological Society. Since 2016, they have been performing annual aerial surveys to obtain waterbird population estimates and dynamics. The generated dataset contains between 10,000 and 100,000 records. Migration to the central ESAS database is planned. However, the data is not in the public domain; permission to use data should be asked, and if used, it should be appropriately credited. Financial obstructions for data mobilization are unknown.

**Contact person:** Ainars Aunins

### **5.4 LITHUANIA**

#### **5.4.1 LIFE Marine Special Protection Area (SPA) project (LTU)**

From 2006 to 2008, a European LIFE project led by the Baltic Environmental Forum (BEF) Latvia was set up to identify the abundance and distribution of seabirds in territorial water of Lithuania and to designate SPAs. The sampling was carried out by the Nature Research Centre (NRC) and included eight surveys in total in different seasons (primarily winter-spring). These ship-based surveys were performed in the Baltic Sea and generated between 10,000 and 100,000 records. NRC has expressed interest to share their data, and no financial or legal constraints for sharing data were identified. This LIFE project covered Latvia and Estonia as well.

**Contact person:** Mindaugas Dagys

### **5.5 RUSSIA**

The Russian Federation is involved in two sampling programmes: the research conducted by the Saint-Petersburg Research Center of Russian Academy of Sciences (SREC RAS) and the sampling campaign led by the Norwegian Institute for Nature Research. The last programme is led by Norway and is discussed there (NINA-NOR).

#### **5.5.1 Sampling by SREC RAS (RUS)**

In 2018, the Saint-Petersburg Research Center of Russian Academy of Sciences (SREC RAS) conducted aerial surveys connected to Ust-Luga port activities in the Gulf of Finland. Sampling was conducted in spring and autumn 2018, and generated up to 10,000 records. It is unknown if the data will be shared, but no financial or legal constraints for the mobilization were identified.

**Contact person:** Julia Bublichenko



## **5.6 POLAND**

### **5.6.1 Monitoring of Wintering Sea Birds (POL-MZPM)**

The Museum and Institute of Zoology of the Polish Academy of Sciences (MIIZ), in cooperation with the Polish Society for the Protection of Birds (OTOP), has been coordinating the Monitoring of Wintering Sea Birds programme (MZPM - Monitoring Zimujących Ptaków Morskich) since 2011. MZPM is the only official governmental offshore bird monitoring programme. The aim of the monitoring programme is to determine numbers, distribution and trends of wintering seabird populations in the Baltic Sea. Their sampling campaigns occur on a yearly basis and are ship-based. The dataset includes about 50,000 records (5,000 records yearly) and is managed by the Chief Inspector of Environmental Protection. Currently, the database is compatible with Polish databases and the INSPIRE database. It is currently not possible to transform the database in its current form to the ESAS format. However, the data contained in the database can be transferred on the basis of "data call".

**Contact persons:** Dominik Marchowski and Włodzimierz Meissner

## **5.7 SWEDEN**

### **5.7.1 National flight surveys (SWE)**

Since 2004, Lund University has engaged in national flight surveys, occurring on a six-year basis. In between, regional flight surveys are being conducted at the request of count boards. These surveys focus on birds only and take place in the Greater North Sea (OSPAR II) and the Baltic Sea. The database contains between 10,000 and 100,000 records. Migration to the central ESAS v6 database has been planned, although costs for this migration are estimated at € 8,000. No problem is foreseen with respect to the mobilization of publicly funded data. However, Lund University also stores data from surveys financed by private companies. For the latter, permission to share should be asked.

**Contact person:** Frederik Haas

## **5.8 DENMARK**

The questionnaire revealed two sampling programmes: one by the Aarhus University and one by the Dansk Marine Observers ApS (Dansk Bioconsult Aps). Although the latter is known to hold SAS data, they were not able to share the requested information at the present time.

### **5.8.1 Programme by Aarhus University (DNK)**

The Aarhus University, Department of Biodiversity, is currently leading the national monitoring of marine birds. Their programme consists of multiple monitoring schemes, with NOVANA as the most permanent one.

**Contact person:** Ib Krag Petersen

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at € 2,500. Additionally, some of the aerial survey data are owned by clients for which permission needs to be obtained.

**Contact person:** Ruben Fijn

### **5.11.2 Ship-based surveys BuWa (NLD-BuWa-SHIP)**

Since 2004, Bureau Waardenburg has been conducting a few ship-based surveys generating between 10,000 to 100,000 records. Examples of such studies were PMR-NCV where between 2004 and 2006 ship-based surveys were conducted to study seabirds in the Voordelta SPA. Another example are some dedicated ship-surveys of Sandwich Terns in the Dutch coastal zone 2020. Data mobilization should not be a problem as Rijkswaterstaat has ownership of the data, though the mobilization might cost up to € 2,500.

**Contact person:** Ruben Fijn

### **5.11.3 Monitoring Waterstaatkundige Toestand des Lands (MWTL) programme (NL-MWTL)**

The MWTL Seabird programme is performing bi-monthly aerial surveys of seabirds and marine mammals on the Dutch Continental Shelf (NCP), with increased effort in the coastal zone and in designated Natura 2000-SPAs. These data are owned by Rijkswaterstaat and managed on their behalf by Sovon bird research. The programme runs since 1984 in different forms. Some major changes were made to the methodology and design in 1991 and 2014. They have a large database (up to one million records), for which the mobilization to ESAS has recently been carried out. Data sharing (particularly in view of inclusion in the ICES database) is strongly supported, but some legal issues will have to be solved.

**Contact person:** Ruben Fijn, Mervyn Roos, Menno Hornman

### **5.11.4 Programme by Royal Netherlands Institute for Sea Research (NLD-NIOZ)**

Since 1985, the Royal Netherlands Institute for Sea Research is involved in year round, ship-based seabirds at sea studies in the Arctic waters (OSPAR Region I), Greater North Sea (OSPAR Region II), Bay of Biscay and Iberian Coast (OSPAR Region IV), Wider Atlantic (OSPAR Region V) and tropics. Next to the systematic screening of ecology and species interactions, they record interactions with fisheries. They manage over 1 million of records, which are partially included in the central ESAS database. Database updates are foreseen, as soon as ESAS is planning an update. No financial constraints are foreseen. Legal constraints include that the commercial use of the data has to be budgeted.

**Contact person:** Kees Camphuysen

### **5.11.5 Programme by Wageningen Marine Research (NLD-WUR)**

Wageningen Marine Research is currently leading a long-running (since 1980) ship-based sampling programme covering a large geographical area (OSPAR I, II, III and IV regions). The database hosts a large number of records , which are partially included in the current ESAS database (n = 477,552). No financial constraints have been identified. No legal constraints are identified for data owned by WUR. However, their database also includes data from the Dutch Seabird Group, for which permission needs to be obtained.

Contact person: Mardik Leopold

## 5.12 BELGIUM

Belgium currently has two active monitoring programmes. They both focus on seabirds and marine mammals in the Belgian part of the North Sea (OSPAR II region).

### 5.12.1 Monitoring by the INBO (BEL-INBO)

Belgium has been performing ship-based monthly surveys to monitor the number and distribution of seabirds and marine mammals, in order to provide input in assessments regarding anthropogenic impacts or input into the Marine Strategy Framework and Bird Directives. These surveys have been carried out by the Research Institute for Nature and Forest (INBO) since 1992 and are still ongoing, however the frequency of recording was lower during 1992-2000. They host a SAS dataset containing between 32,400 records, which is partially integrated in the current ESAS v5 database. Although no financial constraints are mentioned and there's an interest for sharing the data, the data collected within wind farm monitoring surveys (commissioned by the Scientific Service Management Unit of the Mathematical Model of the North Sea (MUMM)) cannot be used nor be distributed without written permission of MUMM.

Contact person: Eric Stienen, Nicolas Vanermen

### 5.12.2 Monitoring by the MUMM (BEL-RBINS)

Since 2008, the Scientific Science Management Unit of the Mathematical Model of the North Sea (MUMM) has been performing aerial surveys of birds and marine mammals. Marine mammals are identified on a visual basis and photographs are taken to further analysis of tracks. These surveys have generated up to 10,000 records. Whether or not MUMM is willing to share their data is unknown. No financial constraints were identified, but data can only be shared with a contribution to the data collector.

Contact person: Jan Haelters

## 5.13 GREAT BRITAIN

The United Kingdom is currently engaged in four monitoring surveys and projects in the Greater North Sea (OSPAR II region), all currently active and each focussing on both birds and marine mammals and often with a specific focus on wind farms.

### 5.13.1 HiDef Aerial Surveying Limited (GBR-HIDEF)

HiDef Aerial Surveying Limited is involved in multiple post consent and Special Protection Area (SPA) monitoring projects (<https://www.hidefsurveying.co.uk/case-studies/>) in the Greater North Sea (OSPAR II) and the Celtic Seas (OSPAR Region III). The general goal of these aerial surveys is to measure the effects and impacts of offshore windfarms on seabird distribution and to monitor changes in numbers and distribution of seabirds in marine SPAs. These projects are commissioned by wind farm developers and the UK statutory bodies such as the Joint Nature Conservation Centre (JNCC), Marine Scotland Science (MSS), Natural England (NE), Scottish Natural Heritage and the Marine Institute in Ireland (MI). HiDef started its first commercial flights in 2009. Their database hosts more than one million records which are currently not integrated in the ESAS database, but integration is planned. Upon migration of

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the data, line and strip transect data would have to be segmented to ensure compatibility. The sharing conditions would need to be negotiated with the data owners on a case-by-case basis. Commercial clients are usually reluctant to share the data, while governmental and non-governmental clients are almost always in favour of sharing.

**Contact person:** Andy Webb

### **5.13.2 British Seabirds at Sea programme (GBR-JNCC)**

The Joint Nature Conservation Centre is currently leading the British Seabirds at Sea programme. This programme has been active since 1980. Observations are made by ship and plane and focus mainly on seabirds and marine mammals in UK waters. The JNCC data, including more than one million records, is currently integrated in the central ESAS v5 database. No financial or legal constraints for mobilizing the data were identified.

**Contact person:** Mark Lewis

### **5.13.3 Sheringham Shoal Offshore Wind Farm programme (GBR-OWF)**

Between 2004 and 2016, ECON (Ecological Consultancy) acted as the lead ornithological consultant in the Norwegian SAS programme at the Sheringham Shoal Offshore Wind Farm between 2004 and 2016. Their monitoring programme included birds and marine mammals in the Greater North Sea (OSPAR Region II). They performed ship-based surveys on a year round basis, with monthly intervals and greater survey intensity in breeding seasons. Their database hosts between 10,000 and 100,000 records. None of these records are currently included in the ESAS database. It is uncertain whether financial or legal issues would constrain data mobilization.

**Contact person:** Richard Berridge

### **5.13.4 Seagreen Firth of Forth Zone programme (GBR-SFF)**

Since 2009, Seagreen Wind Energy has been leading the Firth of Forth Zone offshore wind farm development programme to monitor seabirds. Between 2009 and 2011, surveys were conducted on a monthly basis. Since then, surveys were targeted at the breeding season. About 100,000 to 1 million records have been collected since 2009, but none of those have been included in the central ESAS database up to now. It remains unclear whether or not Seagreen Wind Energy would be willing to share their data, or whether financial or legal constraints would prevent the mobilization of the dataset.

**Contact person:** Richard Berridge

## **5.14 IRELAND**

The questionnaire identified three monitoring programmes, but one organisation, Natural Power Ireland, was not allowed to share the requested information at the present time. Natural Power usually undertakes SAS surveys on behalf of renewable energy developers to produce baseline datasets for impact assessments, and therefore datasets and associated metadata becoming available would usually correspond with the submission of the Environmental Impact Assessment (EIA) Report.

### 5.14.1 Monitoring programme led by National Parks and Wildlife Service (IRL-NPWS-1 and IRL-NPWS-2)

The National Parks and Wildlife Service leads multiple pelagic fisheries surveys that include seabird and marine mammals records in the Celtic Seas (OSPAR Region III, IRL-NPWS-1). These ship-based surveys started in 2018 and are ongoing. The data (> 10,000 records) are intended to be used in the central ESAS database (older data may have been uploaded already). Although the data are collected by agencies with an open-access policy, the publication of some datasets may be under moratorium.

**Contact person:** Graham Johnston

Additionally, From 2016 onwards, the National Park and Wildlife Service is working together with the Marine Institute and the Department of Communications, Climate Action and Environment in Ireland on multiple surveys (e.g. ObSERVE) to collect seabirds at sea data in a standardized way (IRL-NPWS-2). Their ship-based and aerial surveys focus on seabirds only in the Irish Exclusive Economic Zone (EEZ). Currently, the ObSERVE programme has stopped, but boat-based surveys are to start again in 2021 and digital aerial surveys are still ongoing. Although there's an interest for sharing their data, the financial and legal implications of the data mobilization need consideration.

**Contact person:** David Tierney

## 5.15 FRANCE

### 5.15.1 The MEGASCOPE programme (FRA)

The MEGASCOPE programme, currently funded by the French Office of Biodiversity (OFB), is led by Observatoire PELAGIS and has been active since 2004 and focuses on birds, marine mammals, turtles and large fish in the Greater North Sea (OSPAR II), the Celtic Seas (OSPAR Region III) and the Bay of Biscay and the Iberian Coast (OSPAR Region IV). The programme includes a sighting protocol dedicated for marine megafauna for four halieutics surveys PELGAS, IBTS, CGFS, EVHOE (Ifremer's fisheries monitoring). These surveys are annual and concern a sampling for two seasons in the Atlantic (springtime and fall) and two in the English Channel (winter and fall). They are conducted for every monitoring cycle for the Marine Strategy Framework Directive. Their database hosts between 10,000 and 100,000 records. The data holders have expressed interest in sharing their data with the central ESAS database and see no financial constraints for doing so. Data can be shared on the condition that the source is cited or co-authorship is considered in case of publication.

**Contact person:** Ghislain Doremus

## 5.16 SPAIN

We identified five active monitoring programmes in the Bay of Biscay and Iberian Coast (OSPAR IV). All programmes are ship-based, focus on both seabirds and marine mammals, and occur on a yearly basis.

### 5.16.1 Seabird and cetacean monitoring programmes (ESP-AV3)

The Spanish Institute of Oceanography (IEO) has been involved in the seabird and cetacean monitoring programmes under the framework of the Marine Strategy Framework Directive



since 2007. The programme generated between 10,000 and 100,000 records. These records are not included in the ESAS v5 database. It is unsure whether legal or financial constraints will obstruct future migration.

**Contact person:** Camilo Saavedra

### **5.16.2 The JUVENA and BIOMAN programmes (ESP-JUV and ESP-BIO)**

The JUVENA (active since 2013) and BIOMAN (active since 2016) programmes are both led by AZTI (Ciencia y tecnología marina y alimentaria). For both programmes, the sampling strategy is designed to monitor European anchovy and other small pelagic fish over both Spanish and French continental shelf and slope waters. Each programme generated up to 10,000 records. Mobilization to a central ESAS database might be complicated from both a legal and financial point of view, though the specific conditions are unclear and should be analyzed.

**Contact person:** Maite Louzao

### **5.16.3 The PELACUS programme (ESP-PEL)**

The PELACUS programme led by the Spanish Institute of Oceanography (IEO) has been active since 2007 and focuses mainly on Spanish shelf waters in the North and North-West Iberian Coast. The programme generated between 10,000 and 100,000 records. These records are not included in the ESAS v5 database. It is unsure whether legal or financial constraints will obstruct future migration.

**Contact person:** Camilo Saavedra

### **5.16.4 The ECOCADIZ programme (ESP-UCA)**

The University of Cádiz, together with the Spanish Institute of Oceanography, is currently (since 2006) leading the ECOCADIZ programme. The generated database includes up to 10,000 records, with migration to the central ESAS v6 database planned. Whether or not extra costs are associated with the migration is unknown. Sharing of the data is only possible after the publication of the research in the context of a PhD.

**Contact person:** Andrés Delacruz

## **5.17 PORTUGAL**

### **5.17.1 Portuguese Seabirds at Sea programme (PRT)**

Since 2005, the Portuguese Society for the Study of Birds (SPEA) has been collecting data on seabirds and other megafauna (marine mammals and reptiles) at sea using the ESAS methodology. The data is collected under different frameworks in the aim of specific projects. Sampling is ship-based and occurs on a monthly basis. The database includes 100,000 to 1 million species occurrence records from the Portuguese Exclusive Economic Zone, stored in Paradox. Part of these data has been enclosed in the central ESAS database. No financial or legal issues for the mobilization were identified.

**Contact person:** Nuno Oliveira



## 5.18 GREECE

Greece is currently involved in two active monitoring programmes: the Hellenic Seabird Project and the European Marine Strategy Framework Directive (MSFD) for Greece, funded through three LIFE projects. All programmes, except for the MSFD programme, were led by the Hellenic Ornithological Society and BirdLife Greece. The MSFD programme was led by the Hellenic Center for Marine Research. All programmes took place in the East Mediterranean Sea and were ship-based.

**Contact person** (for all programmes): Dana Portolou

### 5.18.1 Hellenic Seabird Project (GRC-HSP)

The aim of the HSP project is to gather reliable information on the population status and conservation priorities of Greek seabirds in order to establish the National Marine Important Bird and Biodiversity Area (IBA) Network, to produce National Species Action Plans and to support their active conservation. The project started in 2013 and is still ongoing. The project generated up to 10,000 records, none of which have been included in the ESAS v5 database. There is an interest in sharing data and financial constraints were identified. The legal framework for data mobilization should be clarified.

### 5.18.2 Past LIFE projects (GRC-LIFE96, GRC-LIFE03, GRC-LIFE07)

We identified three past LIFE projects that generated SAS data:

LIFE project “Larus audouinii - Conservation actions for Larus audouinii in Greece” (GRC-LIFE96) (1992-2001)

LIFE project: “Conservation measures for Falco eleonora in Greece (GRC-LIFE03)” (2004-2006)

LIFE project “Concrete conservation measures for the Mediterranean Shag and Audouin’s Gull in Greece, including the inventory of relevant marine IBAs” (GRC-LIFE07) (2009-2012)

Each project generated up to 10,000 records on these specific species. It is not sure whether these records are included in the current ESAS database, but there is an interest to share, although the legal aspect of this mobilization should be clarified. No financial constraints were identified.

### 5.18.3 EU MSFD programme for Greece (GRC-MSFD)

The European Marine Strategy Framework Directive programme for Greece was set up to monitor the good environmental status of marine waters (D1C1, D1C2 and D1C3 criteria of the MSFD). The programme was led by the Hellenic Center for Marine Research (HCMR) and started in 2020. The programme generated up to 10,000 records so far. None of the records are included in the ESAS v5 database but the respondents are interested in sharing their data. However, both legal and financial constraints could complicate the migration. Costs are estimated at € 5,000, no legal specifications were given.

## 5.19 MALTA (MLT)

In 2020, Malta started the LIFE project (“LIFE PanPuffinus!: Improving the conservation status of endemic Balearic and Yelkouan shearwaters by ensuring safe land and sea”). The project’s

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## References

RStudio Team (2020). RStudio: Integrated Development for R. RStudio, PBC, Boston, MA URL <http://www.rstudio.com/>

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