Outcome of the BfN-JWGBIRD workshop on migratory birds

Introduction

1. Following a workshop on migration routes of seabirds over the Baltic Sea convened on 20-22 November 2018 at the premises of HELCOM Secretariat in cooperation with JWGBIRD, several knowledge gaps were identified with regard to advancing knowledge on bird migration to support work of JWGBIRD. STATE&CONSERVATION 11-2019 considered the proposals for further work on identifying migration routes and staging areas of migrating seabirds (document 3N-5 t that meeting) and agreed that a Migratory birds correspondence group should be established, preferably as a subgroup to JWGBIRD. To support the establishment of the sub-group on bird migration under JWBBIRD, an online workshop was organised in collaboration with the German Federal Agency for Nature Conservation (BfN) and JWGBIRD on 8-9 September 2021.

2. The aim of the regional Workshop was to serve as a kick-off event for the envisaged ICES/OSPAR/HELCOM sub-group on bird migration under JWGBIRD, aiming at bringing together expertise on bird migration, collating data on migratory routes and discussing methodologies to produce high-quality maps of bird migration routes across the North-East Atlantic and Baltic Sea. Given these objectives, a particular focus during the workshop was put on drafting of a workplan for the group to guide further work.

3. The Workshop was attended by 50 experts from the Contracting Parties from the HELCOM, OSPAR and ICES regions, as well as several Observer organizations. The List of Participants is contained as **Annex 1.**

4. The workshop was hosted by BfN and chaired by Mr. Janos Hennicke (BfN), Mr. Dieter Boedeker (BfN), Mr. Ommo Hüppop (Institute of Avian Research, Germany) and co-chair of JWGBIRD Mr. Volker Dierschke (GaviaEco Research, Germany). Laura Kaikkonen, HELCOM Associate Professional Secretary acted as the secretary of the Workshop. The workshop programme is contained in Annex 2.

Agenda Item 1 Welcome, Introduction and Background

5. The Workshop took note of an introduction to HELCOM Recommendation 34E/1 "Safeguarding important bird habitats and migration routes in the Baltic Sea from negative effects of wind and wave energy production at sea" and concretized actions in the new Baltic Sea Action Plan (BSAPUp 2021 - 2030) as presented by Dieter Boedeker, BfN.

6. The Workshop took note of existing international agreements on migratory bird conservation in the HELCOM-OSPAR area, as presented by Nina Mikander (Ministry of the Environment), Finland.

7. The Workshop highlighted the importance of accounting for the existing international agreements and ongoing work in any subsequent work of the bird migration group.

8. The Workshop took note of concerns from the workshop participants that while several recommendations are in place, there seems to be inadequate support from governments and planning agencies for protecting bird migration routes in terms of e.g., offshore energy construction.

9. The Workshop took note of the outcomes of the HELCOM workshop on migratory waterbirds, Helsinki, November 2018 and the associated recommendations from the workshop as presented by Volker Dierschke, Germany.

10. The Workshop emphasized, based on the outcomes of the previous workshop, the importance of weighting species based on population size and vulnerability to collision.

11. The Workshop noted that the flying altitude, both within and between species, can vary notably, e.g. depending on weather and purpose of flight, which makes it more challenging to include it as a parameter to the products of the workshop. The Workshop further noted that the flying altitude of many bird species, not only waterbirds, varies when they migrate over sea areas, and are thus more at risk of collision with offshore structures.

Agenda Item 2 How to identify and map migration routes?

12. The Workshop took note of the following presentations:

- Detecting the migration of birds using weather radar data (Ommo Hüppop, Institute of Avian Research, Germany)
- Bat migration over the Sea (Antje Seebens-Hoyer, NABU, Mecklenburg-Vorpommern, Germany)
- Speedupdate: How to protect migration routes? (Sandra Vardeh, BfN, Germany)
- Identification of routes and threats during migration in small Charadrius plovers – a novel approach using super light-weighted GPS tags in the Wadden Sea (*Dominic Cimiotti (MOIN), Germany)*
- Tracking the migration of Caspian terns and Lesser Black-backed Gulls (Ulrik Lötberg, BirdLife Sweden)

13. The Workshop emphasized that offshore constructions present a threat to all types of birds migrating over sea areas, and not only waterbird species.

Agenda Item 3 Potential and actual threats to birds migrating over sea

14. The Workshop noted that migration of terrestrial birds across the sea areas also needs to be considered in spatial planning.

15. The Workshop took note of the following presentations

- Assessment of collision risk for vulnerable bird species with offshore wind farms (*Aonghais Cook (BTO) Scotland)*
- Bird migration over the sea: methods, space-time patterns and conflicts with offshore wind farms (Stefan Garthe & Phillipp Schwemmer (FTZ), Germany)
- Air space as habitat? (Robb Diehl, US Geological Survey, USA)

Agenda Item 4 Terms of Reference and workplan for a subgroup “Bird Migration” under JWGBIRD

16. The Workshop took note of the updated draft Terms of Reference and workplan for the planned subgroup as presented by the HELCOM Secretariat.

17. The Workshop reviewed the Terms of Reference and workplan for the group (ANNEX 3) and discussed having the subgroup work independently (to the extent possible), as the main group is already very big. The Workshop took note that JWGBIRD co-chairs support this proposal.

18. The Workshop took note of a comment from BirdLife Sweden, with regard to the objective to ”Produce more specific species and sensitivity maps of a given area” that little effort has been made to produce sensitivity maps, and raised a question as to how to make authorities aware of the obligation. Workshop further noted that to work towards the group’s main goal in minimising negative impacts from renewable energy on migrating birds, BirdLife Sweden considers foreseeing and stopping mass collision events as critical. ”Foreseeing mass collision events” means to use e.g. weather data and migration models to

momentarily shut down wind power plants when needed and recommends that implementation of such systems has to be highly prioritised in the group.

19. The Workshop highlighted the importance of clarifying through the ToRs and the group's work the difference between birds that migrate over seas as opposed to birds that inhabit marine areas year-round.
20. The Workshop noted that for many small birds, producing detailed maps will not be possible, whereas such map products may be feasible for larger groups of species and that this should be reflected either in the ToR or the workplan.
21. With regard to the geographical scope of the work, the Workshop discussed whether Arctic areas will be part of the group's work and highlighted that the decision should be made by HELCOM, OSPAR and ICES.
22. The Workshop discussed data availability underpinning the group's work and noted that the group's work relies on various data types, including having access to up-to-date information on planned windfarms and other offshore constructions. The Workshop acknowledged that information on planned (offshore) windfarms difficult to obtain/not easily available, further complicating predictive planning.
23. With regard to the organization of the work, the workshop highlighted the need for the group to focus its work on all bird migration over sea areas. Given the amount of work and additional expertise required to carry out the tasks for the group, the Workshop suggested HELCOM, OSPAR and ICES to consider the opportunity for the group to work independently from JWGBIRD.
24. The Workshop highlighted challenges in attracting relevant expertise to the group and suggested that HELCOM, ICES and OSPAR may also invite/approach relevant experts to join the group. The Workshop particularly highlighted the need for GIS expertise for many of the expected outputs.
25. The Workshop further noted that given the extensive resources required to carry out the group's work, it may be beneficial to outline an estimate of the required resources be provided, or alternatively, the Contracting Parties could be reminded to ensure that nominated experts have time to work on the group's tasks.
26. The Workshop took note that the workplan and ToR of the group will be initially evaluated by the HELCOM State&Conservation Working Group in their meeting on 4-8 October 2021, after which further information on the organization of the group will be available.
27. The Workshop took note that interested experts are invited to express their interest to join the group to the HELCOM Secretariat (laura.kaikkonen@helcom.fi).
28. On behalf of the organizers, Dieter Boedeker thanked all the speakers of the Workshop and all those who participated in the discussions or listened with interest. He expressed his hope that the participants have benefited from the workshop and that they gained new insights. Finally, he expressed special thanks to Laura Kaikkonen from the HELCOM Secretariat, and all co-hosts of the Workshop Volker Dierschke, Ommo Hüppop, Janos Hennicke, Karolin Schulze and Gesine Lange.

Annex 1. List of participants

Name		Organization
Antje	Seebens-Hoyer	Nature and Biodiversity Conservation Union
Antonio	Vulcano	BirdLife International
Antra	Stīpniece	Latvian Ornithological Society
Antti	Below	Metsähallitus Parks and Wildlife Finland
Aonghais	Cook	British Trust for Ornithology
Arndt	Wellbrock	Institute of Avian Research "Vogelwarte Helgoland"
Daniel	Bengtsson	BirdLife Sweden
Dieter	Boedeker	Federal Agency for Nature Conservation, Germany
Dirk	Bernotat	Federal Agency for Nature Conservation, Germany
Dominic	Cimiotti	Michael-Otto institute, Nature and Biodiversity Conservation Union
Dominik	Marchowski	Museum and Institute of Zoology Polish Academy of Sciences
Dominique	van Eick	VLAMV e.V.
Dorota	Łukasik	Chief Inspectorate Of Environmental Protection
Fredrik	Haas	Lund University, Sweden
Gesine	Lange	Consultant for the Federal Agency for Nature Conservation, Germany
Hans	Schekkerman	Sovon Dutch Centre for Bird Research
Helen	Wade	NatureScot
Henrik	Skov	DHI, Danish Hydraulic Institute
Jacob	Davies	British Trust for Ornithology
Jan	Kieckbusch	State Agency for Agriculture, Environment and Rural Areas Schleswig-Holstein (LLUR), Federal State Institution for Bird Conservation
Janos	Hennicke	Federal Agency for Nature Conservation, Germany
Julia	Loshchagina	Institute of geography RAS
Julie	Miller	Marine Scotland Science
Julius	Morkūnas	Lithuanian ornithological society
Katrin	Schikorr	DUH, Deutsche Umwelthilfe
Klaus	Günther	Schutzstation Wattenmeer
Kristine	Brüggemann	University of Veterinary Medicine Hannover
Lara	Salvany	International Council for the Exploration of the Sea
Laura	Kaikkonen	HELCOM
Markus	Billerbeck	German Federal Maritime and Hydrographic Agency

Matt	Parson	Joint Nature Conservation Commitment, UK
Mindaugas	Dagys	Nature Research Centre Lithuania
Morten	Frederiksen	Aarhus University, Department of Bioscience
Nele	Tschense	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Germany
Niclas	Lignell	BirdLife Sweden
Nina	Mikander	Finish Ministry of the Environment
Nuno	Oliveira	SPEA
Oliver	Schall	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Germany
Ommo	Hüppop	Institute of Avian Research "Vogelwarte Helgoland"
Petr	Glazov	Institute of geography RAS
Philipp	Schwemmer	Research and Technology Centre (FTZ), University of Kiel
Rasa	Morkūne	Marine Research Institute, Klaipeda University
Robert	Diehl	US Geological Survey, Northern Rocky Mountain Science Center
Sandra	Vardeh	Federal Agency for Nature Conservation, Germany
Sergey	Dereliev	UNEP/AEWA
Stefan	Garthe	Research and Technology Centre (FTZ), University of Kiel
Thomas	Borchers	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Germany
Ulrik	Lötberg	BirdLife Sweden
Verónica	Neves	Okeanos R&D Centre of the Azores University
Volker	Dierschke	Gavia EcoResearch

Annex 2 Workshop Programme

"WORKSHOP on Bird migration in the OSPAR and HELCOM Regions"

Wednesday, 8 September to Thursday, 9 September 2021

organised by the
German Federal Agency for Nature Conservation (BfN) together with the HELCOM Secretariat

online!

Topics and goals of the workshop:

This regional workshop will serve as kick-off event for the envisaged ICES/OSPAR/HELCOM sub-group on bird migration under JWG Bird, aiming at bundling expertise, collating data and discussing methodologies to produce high-quality maps of bird migration routes across the North-East Atlantic and Baltic Sea. Particular focus during the workshop will be put on drafting of a workplan for the group to guide further work.

In order to contribute to the implementation of OSPAR and HELCOM Programmes on safeguarding migratory birds and in line with the aim of Germany's HELCOM chairmanship to support the tracking of the routes of migratory birds, the outcome of the workshop should prepare the ground for future work on the development of conservation measures and facilitate cooperation in the OSPAR and HELCOM region.

Agenda

- Item 1
  Welcome, Introduction and Background
- Item 2
  During this session various ways to identify bird migration over the sea will be presented and discussed
- Item 3
  Presentations and discussions about potential and actual threats to birds migrating over sea
- Item 4
  In this session the TOR will be presented and the draft workplan for the subgroup on bird migration will be discussed.

Agenda items 1 to 3 will be dealt with on Wednesday, 8 September (evtl. also beginning of Thursday) and Agenda item 4 will be discussed on Thursday, 9 September.

On Thursday, unannounced short speedupinfos from participants will also be possible.

Time table	
Wednesday , 8 September 2021	
Agenda Item 1	**Welcome, Introduction and Background** *Moderation Dieter Boedeker (BfN), Germany*
09:00	Welcome and introduction of participants "tour de table" *Janos Hennicke & Dieter Boedeker (BfN), Germany*
09.20	HELCOM Recommendation 34E/1 "Safeguarding important bird habitats and migration routes in the Baltic Sea from negative effects of wind and wave energy production at sea" and concretized actions in the new Baltic Sea Action Plan (BSAPup 2021 - 2030) *Dieter Boedeker (BfN), Germany*
09.40	Existing international agreements on migratory bird conservation in the JWG Bird area *Nina Mikander (Ministry of the Environment), Finland*

10.20	Outcome of the HELCOM workshop on migratory waterbirds, Helsinki, November 2018 *Volker Dierschke (GaviaEco Research), Germany*
10.50 - 11.10	**Break**
Agenda Item 2	**How to identify and map migration routes?** *Moderation Janos Hennicke (BfN), Germany*
11.10	Speedupdate: Identification of routes and threats during migration in small Charadrius plovers – a novel approach using super light-weighted GPS tags in the Wadden Sea Dominic Cimiotti (Michael-Otto-Institut im NABU), G*ermany*
11.30	Detecting the migration of birds using weather radar data *Ommo Hüppop, Arndt Wellbrock (Institute of Avian Research), Germany*
12.10	Bat migration over the Sea *Antje Seebens-Hoyer (NABU, Mecklenburg-Vorpommern), Germany*
12.40	Speedupdate: How to protect migration routes? *Sandra Vardeh (BfN), Germany*
13.00-14.00	**BREAK**
14.00	Tracking the migration of Caspian terns and Lesser Black-backed Gulls fuscus *Ulrik Lötberg (BirdLife International, Sweden)*
Agenda Item 3	**Potential and actual threats to birds migrating over sea** *Moderation Ommo Hüppop (Institute of Avian Research), Germany*
14.40	Assessment of collision risk for vulnerable bird species with offshore wind farms *Aonghais Cook (BTO) Scotland*
15.20	Bird migration over the sea: methods, space-time patterns and conflicts with offshore wind farms *Stefan Garthe & Phillipp Schwemmer (FTZ), Germany*
16.00-16.10	**Break**
16.10	Air space as habitat *Robb Diehl (US Geological Survey)*
17.00	**End of Day 1**
Thursday , 9 September 2021	
Agenda Item 4	**TOR and workplan for a subgroup "Bird Migration" under JWG BIRD** *Moderation Dieter Boedeker (BfN), Volker Dierschke (GaviaEco Research), both Germany, and Laura Kaikkonen (HELCOM Secretariat)*
09.00	Presentation of the draft TORs for the subgroup *Laura Kaikkonen (HELCOM Secretariat)*
09.30 - 12.30 (break at 10.30)	Discussion of the draft TORs and draft workplan (tasks) for the subgroup ***WS was invited to suggest amendments to the drafts***
12.30-13.15	**Break**
13.15	Continued discussion
14.30	**End of Workshop**

Annex 3 Comments from the Workshop on the draft ToRs and workplan

Draft [ToRs] for joint ICES/OSPAR/HELCOM sub-group on bird migration under JWGBIRD

Please note that these draft Terms of Reference are pending approval from HELCOM State & Conservation Working group meeting, to be held on 4-8 October 2021.

Background

These [ToRs] provide a thematic overview of the work carried out by the joint ICES/OSPAR/HELCOM sub-group on bird migration, under JWGBIRD.

The HELCOM-OSPAR-ICES Joint Working Group on seabirds (JWGBIRD) is a platform for experts from the Baltic Sea and Northeast Atlantic regions to work on waterbird issues and is made up of members nominated via each of the three organizations. JWGBIRD provides a unique forum to address issues relating to waterbird research and conservation across an ecologically relevant geographic scope, ranging from the NE Atlantic, the Baltic Sea, and the Arctic. While many aspects of bird migration (such as securing staging and wintering areas) are dealt within JWGBIRD, specific expertise on topics relating to the active flight stage of migratory birds has been lacking. The overarching aim of the sub-group is to incorporate/ harness further expertise on bird migration to the main group in order to support improved conservation of migratory birds in marine areas.

As a result of increasing anthropogenic pressures on marine ecosystems, waterbirds have become the world's most threatened bird group. Average European waterbird population trends are either stable or declining. Approximately 33 % are slightly declining and another 22 % are regarded as threatened (BirdLife International, 2015). In the Norwegian Arctic, the Greater North Sea and the Celtic Seas, there has been an overall drop of 20 % in waterbird populations over the last 25 years for more than one quarter of the species assessed (OSPAR, 2017).

Use of the marine environment, including generation of renewable energy, is likely to further increase in the near future. This will affect birds migrating over sea areas, with an increased risk of direct collision with wind turbines, as recognized in the HELCOM Recommendation 34E/1. Under the Habitats and Birds Directives the EU Member States need to designate specific areas as marine Natura 2000 sites to implement the aforementioned Directives. In order to secure an improved status of migratory waterbird species, the requirements inherent from migratory behaviour need to be included in management and conservation efforts through both securing barrier-free airspace for the migratory flight and securing stopover (and wintering) habitats.

However, the migratory behaviour of birds migrating over sea areas is still poorly understood, presenting a significant barrier to strategic planning and conservation efforts, especially at a trans-boundary scale. These knowledge gaps partially stem from the spatial and temporal limitations in the tracking information available to elucidate on species behaviour. While data on migration are available from tracking studies, migration counts and radar observations are often insufficient to draw conclusions. Where sufficient data are not available, additional monitoring should be implemented.

Sensitivity mapping is a key tool in understanding the sensitivity of marine areas to human pressures based on the presence of species that are expected to be affected by these pressures. This information can help decision-makers to arrange effective planning and management, e.g., by limiting specific activities to ensure that negative impacts are avoided or minimised. In order to create sensitivity maps, it is necessary to enhance the collection and processing of data on the spatial-temporal distribution and abundance of species.

Commented [A1]: Note from WS: proposal to establish independent expert group and not a subgroup

JWGBIRD co-chairs support having the subgroup work independently (to the extent possible), as the main group is already very big

Commented [A2]: change wording to highlight group's independence of the main group

Commented [A3]: WS cmnt: clarify birds that migrate over seas vs birds that inhabit marine areas year-round

amend waterbirds to birds, where appropriate

Commented [A4]: WS: consider that for many small birds, producing maps will not be possible ; but for larger groups of species feasible; to reflect either in the ToR or the workplan – to ToR; consider all birds

Information on sensitivity, migratory behaviour, and spatiotemporal data on migration, as well as information and guidance on how it should be interpreted and best used, are key components of future planning and management efforts in Strategic Environmental Assessments (SEA) and Environmental Impact Assessments (EIA), further supporting sustainable use of marine areas through spatial planning.

Purpose

The overall purpose of the group is to facilitate regional cooperation in relation to bird migration with respect to safeguarding bird migration from negative effects of wind and wave energy production at sea, in close cooperation with other existing relevant frameworks and programmes working on bird migration.

It is to function as a coordinating framework and a platform to harness the expertise of leading scientists on bird migration, and to make this expertise available to policy makers and planners. In addition, the group will work on improving functioning dataflows and availability of data on bird migration. Through this, the sub-group helps ensure that up to date information on bird migration is accounted for in regional processes through JWGBIRD and subsequently in the advice and decision-making of the three organisations.

Scope

The sub-group's work will focus on bird migration over sea areas. This information will support collecting the data necessary to inform and guide management measures. The group's work focuses on risks to migratory birds from renewable energy generation (wind, wave, and tidal power), including infrastructure, and may be extended to other human activities deemed relevant for active migration over sea areas.

The sub-group will handle/xyz the operational production and delivery of the scientific products of the dedicated work on bird migration, e.g., related to data collection and collation, developing methodology and guidance for monitoring, guidance on the use of produced data to inform spatial planning, as well as other tasks agreed by JWGBIRD and the three organizations and assigned to the group. The work includes producing maps on species migration routes and sensitivity to human pressures, transferring quality assured science to end users, and providing clear guidance on the level of confidence in the presented information. The work can also support the identification of knowledge gaps and possible future research priorities. Due to limited data, it can be necessary to classify the selected migratory bird species in groups.

The work is transregional by nature and aims to cover the ecologically relevant geographical scope of migratory waterbirds across the NE Atlantic, the Baltic Sea and the Arctic.

The principal benefits of the sub-group are to have:

a) Enhanced use of existing knowledge and improved dataflows for /various data types/e.g., radar, telemetry and tracking data, and migration count data, with a focus on encouraging data sharing.
b) Improved access to information on migratory behaviour of birds migrating over sea areas
c) Improved monitoring practices for birds migrating over sea areas
d) Improved map products and appropriate use of data and map products in spatial planning
e) Improved transfer of research results and products between planners and to the policy level
f) Improved advice on necessary actions and measures and on how regional policies could be adapted to better account for bird migration in spatial planning.

Objectives

The objectives of Migration the sub-group are to:

a) Map the overall knowledge level of bird migration in the Baltic and North Sea regions based on existing data, expert knowledge, and ongoing research and post-consent monitoring, including gaps and recommendations for the relevant species (including whether the species is relevant for planning and why, altitude information etc.)

Commented [A5]: name existing mechanisms re bird migration in the background/scope

Commented [A6]: rephrase

Commented [A7]: vague, specify

Commented [A8]: amend based on decision on the group's working mode

Commented [A9]: WS: tie to existing initiatives

Commented [A10]: WS: arctic? OSPAR &ICES to comment on the geographical scope

b) Improve joint data management on a trans-regional level.
c) Produce detailed recommendations on how to conduct monitoring of birds migrating over sea areas to support the existing monitoring guidelines, possibly producing best-practice guidelines and harmonizing monitoring practices for e.g., citizen science observations and visual migration counts.
d) Produce and regularly update more specific species and sensitivity maps of a given area to e.g. renewable energy installations, in a way that allows inclusion of multiple types of data sources.
e) Cooperate with other initiatives to find synergies and to avoid duplication of ongoing work.
f) Cooperate closer with the planners, e.g., through scoping workshops to share information, challenges and needs.
g) Compile/define a list of priority species/species groups
h) Identify funding possibilities for dedicated projects to support further work on bird migration and look into possibility to form a consortium, potentially in collaboration with ICES, HELCOM, and OSPAR, to prepare and submit an application.

Commented [A11]: note: a lot of work involved

Commented [A12]: note: information on planned (offshore) windfarms difficult to obtain/not easily available, complicates predictive planning

pt: not only bird data; the group's work relies on various data types, including having access to up-to-date information on planned windfarms and other offshore constructions

Reporting

Commented [A13]: to be revised according to decisions on the group's working mode

note on reporting: through JWGBIRD/directly to 3 organisations

The sub-group will report back to JWGBIRD and subsequently to the ICES, HELCOM, and OSPAR Working Groups. For all scientific products, the sub-group will present a production plan for sign off by JWGBIRD. For region-specific outputs, the work may also be carried out in task teams without the involvement of experts from all three organizations.

Reporting on the tasks, work and products of the sub-group will be included in the JWGBIRD annual report. Products developed and delivered intersessionally shall be appended to the report. The report is co-authored by the three organisations. The products stemming from the groups work will be handled at ICES workspaces dedicated to this purpose.

The group may also, where possible and appropriate, submit some products for publication in scientific journals or to be presented at conferences.

Membership

Commented [A14]: Note from Workshop: interested experts are invited to express their interest to join the group to HC secretariat

Q: how to attract relevant expertise to the group? – CPs/organizations may also invite/approach relevant experts

Membership of the sub-group is obtained either by experts seeking nomination from their national delegations to either ICES, OSPAR or HELCOM, or via direct nomination by the Contracting parties/the three organizations. It is important that all members of the sub-group have a firm connection to their national delegations. Members of the sub-group can also be observers of JWGBIRD. The [sub-group lead/JWGBIRD co-chairs] can also invite non-members to attend the annual meeting or to take part in intersessional work. Invited experts should demonstrate particular skills that are relevant to the delivery of a specific request.

Temporary involvement of other expertise within the respective organizations' structures can be further explored based on the list of tasks as the work progresses. The ICES, HELCOM, and OSPAR Secretariats together with the [JWGBIRD co-Chairs/sub-group lead] will evaluate the coverage of required technical expertise and communicate with the respective organisation on any additional need for expertise in the group. The aim is to ensure sufficient expertise for all identified tasks.

Task list

Concrete tasks for the group will be presented in the task list included in Annex 1. The work plan is valid for a three-year period following the tasks identified in the JWGBIRD work plan but should be reviewed and updated on an annual basis to ensure that the timeline and planned work remains relevant. This task list enables long-term planning and delivery of significant products that may require several components to be developed during consecutive years.

Validity of [ToRs] [WS note: tbc after decision on the group's mode of work]

The work of the group is open ended but subject to review every three years, in line with the JWGBIRD workplan. The Terms of Reference are to be subjected to review and, as appropriate, revision by the JWGBIRD

at three-year intervals and subsequently presented for endorsement by the relevant HELCOM, ICES and OSPAR working groups.

Organization of work

The mode of work for the sub-group will include correspondence and online meetings facilitated by ICES, with physical meetings taking place as needed. Expert opinion will be required at more frequent intervals than annual, and the annual meeting cycle and reporting format of the group may not necessarily be the most appropriate forum in which to deal with such requests (e.g. due to mismatched deadlines). Correspondence and intersessional work between relevant group members should be used to provide a timely delivery of required outputs. Contracting Parties of the various conventions will need to be made aware of the resources (i.e. time of experts) that will be required for all aspects of the Group's work.

Commented [A15]: Note from WS: should an estimate of the required resources be provided, or should the CPs be reminded to ensure that nominated experts have time to work on the group's tasks?

potential to rephrase if CPs need to ensure resources

Given the extensive expertise and workload required to carry out the work related to bird migration, specific actions carried out by the sub-group can be resourced through designated project funding. The possibilities of acquiring funding for the sub-group's tasks through forming a consortium may subsequently affect the timing of completing actions in specific years or months. Whenever a project-funded activity is planned, JWGBIRD will communicate details on the planning to OSPAR, HELCOM and ICES well in advance of the activity to enable dissemination of the information to all possibly concerned parties.

The group should connect with other relevant bird groups and networks.

ICES will provide administrative support to the sub-group as a part of JWGBIRD's activities.

Annex 1: Preliminary Task list of the Bird Migration sub-group

Please note that the task list below is ~~likely overly~~ ambitious and the specific task list for the sub-group will be considered by the group once established.

This task list is valid for a 3-year period (beginning XXXX) and is to be reviewed and revised by the sub-group and approved by JWGBIRD with approval from the relevant ICES, HELCOM and OSPAR Working Groups. The task list should be considered as a reference document to help guide the subgroup's work, rather than a definitive list of tasks that must be carried out.

Theme	Task	Specifications	Timeline
Supporting information	Produce a list of s/priority species/species groups for each region in cooperation with representatives from national planning authorities, responsible for spatial planning to ensure that the information is relevant for planning purposes. Make the information accessible e.g. through species information sheets or a database.	Develop structure and relevant content for supporting information, including but not limited to:	
		Name and relevant ecology of species.	
		Timing and drivers of migration.	
		Temporal aspects of migration, including seasonality, monthly and time of day	
		Information on flight altitude.	
		Species distributions	
		Species movements in space and time	
		Drivers that control patterns in distribution and movement.	
		Identify species that are clear broad-front migrants vs. those for which tracking would yield good results	
		Bird behavior when facing barriers or obstacles (e.g. windfarms)	
		Bird behavior under varying weather conditions etc.	
		Is species relevant for planning and why	
		migration occurring at night and daytime.	
Monitoring, data, and information flows	Data management infrastructure	Perform gap analyses for data, e.g. low amount and narrow spatial distribution of data for	

		several species migrating over sea areas.	
		Agree on the use of a trans-regional data format drawing on existing data formats (e.g. MoveBank)	
		Establishing data flows	
		Establishing long term consistent data hosting	
		~~Ensure that data is accessible~~Encourage better access to data	
	To map the overall level of available knowledge for the relevant bird species (as defined by the sub-group) in order to produce an overview and a gap analysis.	Consider/provide advice for accounting for changing migratory routes due to environmental/climate change (drawing on e.g use of modelling results on future projections)	
	Produce detailed monitoring guidelines on how to conduct monitoring of migratory [birds/waterbirds]	Recommend specifications for tracking devices to collect an increasing number of fixes and register additional information, e.g. flight altitude.	
		Recommend species for monitoring to broaden spectrum to ensure the data is useful for also for planning purposes.	
		Calculate and recommend the required tagging effort and distribution in order to get proper coverage for statistical analyses	
	Explore and provide guidance for citizen science relating to migratory [birds/waterbirds]	Ensure that effort is logged (hours etc) when conducting and including citizen science in the information, guidance to ensure quality-checking and quantifying the data is available.	
	Plan and recommend how to best implement joint surveys (e.g. interlacement of existing national monitoring programmes)	Monitoring using tracking data and for the tracking efforts to be spread out across the distributional range of	

	on migratory waterbird species' to further identify and gain knowledge on migratory [bird/waterbird] species	the species (to account for that sub-populations might have different migration behavior).	
	Prepare guidelines for collection of post-construction investigations of actual effects from wind and wave energy, based on before/after comparison studies.		
	Develop a digital catalogue with GIS-maps concerning migration routes, moulting areas, staging areas, and other features that influence the distribution of birds/waterbirds in space and time [especially regarding windfarm footprints]. [note: GIS expertise needed	Make the catalogue publicly available.	
		Communication/ outreach about the developed GIS-maps.	
Maps on bird/waterbird migration and staging.	To produce species specific migration maps in order for the final maps to meet the requirements of planning.	Develop common methodology for producing species specific migration maps.	
		Prepare information in approximate numbers of individuals of birds/waterbirds using the routes	
		Set definitions for how to evaluate confidence and uncertainty (whether data is based on expert judgment and/or data, and the size and quality of the dataset)	
		Provide uncertainty estimates as an integrated component of the maps	
		Develop and agree on how to, in addition to numbers of individuals of species using a given route, also consider their conservation status.	
		Consider if and how to best include buffers, sensitivity scores or	

Commented [A16]: check/specify difference to tasks in the 'maps' theme- re making the information publicly available?

- specify that refers to maps produced/information collated by the subgroup

Commented [A17]: + consider defining the required/minimum amount of data// describe information needed for producing sensitivity maps? – consider adding to tors/higher up in the tasks/themes?

		weighting to the layers and tracks.	
		Agree on an appropriate approach for including buffer zones around the area with the highest density of /individuals	
		Set definitions for how to weigh the tracks	
		Link relevant information collated under X with the maps, e.g. as part of the metadata information.	
	Preparing large scale sensitivity mapping through aggregating species layers.[GIS expertise needed]	Develop common methodology for producing aggregated sensitivity analysis maps for resting areas and migratory routes of birds migrating over sea areas.	
		Approximate numbers of species and individuals of waterbirds using the routes	
		Consider if and how to best include buffers, sensitivity scores or weighting to the layers.	
		Agree on an approach for including buffer zones around the area with the highest density of species/individuals.	
		Develop and agree on how to, in addition to numbers of individuals of species using a given route, also consider rarity of the species.	
		Set definitions for how to evaluate confidence and uncertainty (whether data is based on expert judgment and/or data, and the size and quality of the dataset)	
		Provide uncertainty estimates as an integrated component of the maps	
		/'Use the best available knowledge on species-	

		specific collision risks in the sensitivity mapping	
	A compiled description of the effects on migratory bird species/species groups from human activities at sea, Comprising gaps of knowledge [Note from migration WS2: beyond ToRs for the subgroup? also large task if many pressures/activities are to be considered]	Addressing the subject of cumulative effects from human activities in space and time. Evaluation of potential impacts on the flyway population level as well as development of methods to address potential cumulative impacts from these effects.	
	Complement the information on migration with information on resting/staging waterbirds, to be presented [to policy-makers] as separate sensitivity maps (for reasons of transparency and detail) in collaboration with JWGBIRD.	Develop maps	
		Link routes to staging areas [in a chosen presentation format	
	Prepare a publication [in a format chosen by the sub-group] of migration in the Baltic Sea and NE Atlantic [tbc], including gaps and recommendations		
	Prepare recommendations for actions based on the results of the migration and sensitivity mapping.		