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Background

STATE & CONSERVATION 7-2017 discussed how to initiate a follow-up of the Recommendation 34E/1 'safeguarding important bird habitats and migration routes in the Baltic Sea' as a whole in 2018. The meeting welcomed the offer of Lead Country Sweden, with support of Germany and possibly Finland, to elaborate a proposal for consideration by STATE & CONSERVATION 8-2018 of a project to compile maps on migration routes of birds and other necessary activities for following up on the implementation of the Recommendation.

STATE & CONSERVATION 8-2018 agreed to arrange a workshop, in cooperation with JWG BIRD, to collate data and draft a regional map of seabird migratory routes and identify potential data gaps in relation to this. The workshop was agreed to be held at the HELCOM Secretariat in autumn 2018. The meeting invited co-leads Sweden and Germany, in cooperation with the Secretariat, to take the organization of the workshop forward.

HOD 54-2018 approved organizing the workshop to support the implementation of HELCOM Recommendation 34E/1 on migratory birds, at the HELCOM Secretariat, and in cooperation with JWG BIRD, in autumn 2018.

The Workshop on migratory waterbirds took place 20-22 November 2018 at the premises of HELCOM Secretariat in Helsinki.

Action requested

The Meeting is invited to take note of the outcome of the HELCOM workshop on migratory waterbirds.

Outcome of the HELCOM workshop on migratory waterbirds

Introduction

1. In accordance with the decision by HOD 54-2018 (Outcome of the meeting, paragraph 4.11) a workshop on migration routes of birds over the Baltic Sea was convened on 20-22 November 2018 at the premises of HELCOM Secretariat, in cooperation with JWG BIRD. The Workshop was organized in order to support the implementation of 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" by producing a map with migration routes of waterbird species covering the entire Baltic Sea Region. The workshop brought together data from i) coastal migration counts, ii) waterbird counts at staging/ stopover sites, iii) tracking data (satellite telemetry, GPS data loggers) and iv) radar observations.

2. The workshop was attended by experts from all Contracting Parties except Latvia, Poland, Russia and EU. The List of Participants is contained as **Annex 1**.

3. The Meeting was chaired by Mr. Volker Dierschke, Germany. Ms. Jannica Haldin, HELCOM Professional Secretary and Ms. Laura Hoikkala, HELCOM Associate Professional Secretary acted as secretaries of the Workshop.

Main activities and conclusions from the workshop

Planning the work process

4. The Workshop took note of the introduction to Recommendation 34E/1 as presented by the Secretariat (presentation 1).

5. The Workshop agreed that given the time and data available the workshop aims to initiate the work on producing maps of migration routes of birds in the Baltic Sea Area to support planning efforts and avoid detrimental effects to bird populations as a result of offshore wind energy facilities. At this stage staging and moulting areas will, where available, only be covered in the additional information provided for the maps, and as the information and expertise on wave energy was limited in the workshop it was agreed that this is outside of the scope of the current work.

6. The Meeting agreed that relevant questions or topics that are out of the scope of the present Workshop are taken into account in Annex 2 on identified gaps in knowledge or data or in Annex 3 on recommendations to further or improve the work made by the workshop.

7. The Workshop agreed on the main products of the workshop to be example maps for a subset of chosen species, using field observations, tracking data and expert judgement, and to test a gridded map method using tracking data and kernel density analysis, both for individual species and aggregated across several species. The Workshop emphasized the importance of ensuring the uptake of products by making them as aligned with the needs of the planning community as possible.

8. The Workshop identified that migration course polygons and additional buffers are products on the way to a final product, but cannot be used in a planning context in their own right. The ultimate goal of the work should be high resolution, seasonal species-specific maps of migration routes and aggregated sensitivity maps for the Baltic Sea based on tracking data, which are useful for planning purposes and regularly reviewed and updated as needed.

9. The Workshop emphasized that a data form – elaborated in cooperation with national authorities responsible for spatial planning, including those dealing with the construction of offshore wind farms – is needed for more focused work towards a final product to be initiated. The Workshop recognized that failing to do so will increase the risk that the product will be of little help in national spatial planning work and so limit its usability with regards to implementing the Recommendation.

10. The Workshop took note of the introduction to the Workshop, bird migration in the Baltic, and available data, as presented by the Chair (presentation 2).

11. The Workshop took note of the presentation by Mr. Margus Ellermaa on the National study of main migration routes in Finland (presentation 3).
12. The Workshop noted that suggested tasks and work process as presented by the Chair, include aggregating information on the sites used by waterbirds and sites passed by migrating waterbirds (indicating areas touched by migration), considering where bird ringing data can be a useful addition, checking where radar studies can supplement other information and aggregating tracks to migration routes (presentation 2).
13. The Workshop took note of the available data loaded to the Meeting portal workspace. The Workshop noted that there is tracking data available for the workshop of around 20 % of the 96 migratory waterbird species in the Baltic Sea.
14. The Workshop discussed how to divide species into groups in a useful way e.g. based on ecology, taxonomy, flight altitude and timing of migration etc.
15. The Workshop agreed to concentrate on the following example species from several taxonomic groups: Bewick's Swan, Barnacle Goose, Brent Goose, Greater White-fronted Goose, Common Eider, Long-tailed Duck, Velvet Scoter, Red-throated Diver, Common Crane, Curlew, Caspian Tern, Lesser Black-backed Gull, based on data availability.
16. Workshop participants were divided into groups addressing 1) tracking, 2) staging and wintering and 3) visual observations and migrations for selected species.
17. The Workshop discussed how to present the information on migration routes including the possibility of using different weighting for the routes, e.g. based on the number of species or individuals. The Workshop further noted that due to the intermittent lack of coverage and varying quality of the available data, weighting cannot yet be reliably included.
18. The Workshop agreed that the following aspects are important to take into account when identifying migration routes and associate areas or production of sensitivity maps, for the product to be useful e.g. to authorities and planning purposes:
 - a. flying altitudes of the species
 - b. temporal aspects, including seasonality, monthly and time of day
 - c. a gridded approach is needed for the final maps to meet the requirements of planning
 - d. a buffer zone around the area with the highest density of species/individuals
 - e. confidence (whether data is based on expert judgment and/or data, and the size and quality of the dataset)
 - f. maps should always come with extensive supporting information on the data they are based upon in a prominent place
19. The Meeting 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.

Products and deliverables

20. The Workshop agreed to produce a written account and seasonal migration maps for selected example species for which reliable information is available and to include the confidence of the expert judgement or data to these maps. The Workshop further agreed that relevant information, including temporal linkage and altitude of the migration when possible, is included with the maps, e.g. as part of the metadata information.
21. The Meeting agreed that for Velvet Scoter and Red-throated Diver alternative methods were to be tested (gridded approach with weighting for Red-throated Diver, aggregated across seasons), (linking information on wintering areas and counts, as well as weighting migration routes based on total population estimates, separated for seasons for Velvet Scoter).

22. The Workshop discussed how to deal with spatial biases in the data.
23. The Workshop discussed that in addition to numbers of individuals of species using a given route also rarity of the species needs to be taken into account. The Workshop further discussed that this is also an issue of interpretation of the produced maps by the persons conducting spatial planning, and/or can be included using sensitivity scores in any aggregated maps.
24. The workshop took note of the presentation by Andreas Dänhardt and Ramona Beckmann, BSH (German Federal Maritime and Hydrographic Agency), on Information relevant for assessing impacts on migratory birds in the Baltic Sea with special reference to offshore windfarms (Presentation 4).
25. The Workshop took note of the comment by BSH that the resolution of the maps produced by the Workshop is not high enough for their needs in decision making, but that initiating this work is highly valuable for the authorities.
26. The Workshop noted that there are country-wise differences in requirements of post construction monitoring.

Maps produced by the workshop

27. The Workshop produced the following species specific maps:
- a. Greater White-fronted Goose: autumn and spring migration. No data was available from Russia and Russian expert should be contacted for obtaining information.
 - b. Brent Goose: autumn and spring migration. The main migration route is well known, with no major gaps and is among the narrowest known migration routes.
 - c. Barnacle Goose: spring and autumn migration. The confidence of the map is good. No data was available from Russia and northern Gotland. Northern side of Gotland is not a major route for Barnacle Goose. Both Barnacle and Brent Goose are strongly driven by winds while migrating, and the variation in the route is probably higher than the one presented in the map.
 - d. Bewick's Swan: autumn and spring migration. Map is based on satellite data. The species does not have very narrow tracks but flies over the sea.
 - e. Velvet Scoter: spring migration. The map presents the main migration route with high confidence and no major gaps. Map shows weighting based on proportion of Velvet Scoters going through the area. There are gaps in migration in the northern Baltic Proper, Bothnian Sea and near southwestern coast of Sweden. Both Common and Velvet Scoter have also inland migration.
 - f. Caspian Tern: spring and autumn migration. Most common routes of the migration are known. No tracking data from the Gulf of Finland was available. The routes are mainly based on tracking.
 - g. Cranes: autumn and spring migration. The maps are rough drafts. More data probably exists but was not available for the workshop. The map should not be published at this stage due to uncertainties. Heavy migration between southern Sweden and Germany in spring is known. Cranes also have a lot of inland migration.
 - h. Curlew: autumn migration. The species is migrating in a broad front over the entire area. There is data gap in the Bothnian Bay.
 - i. Lesser Black-backed Gull: autumn migration. The migration routes have fairly high confidence, but migration is hard to distinguish from the dispersal of birds on their flying trips across the Baltic Sea, as the species has tendency to move around a lot with potential encounters with windfarms. There was no tracking data from the Gulf of Finland, but there is probably important migration route in the eastern part of the gulf. Migration occurs kilometers off the coast.

- j. Red-throated Diver: spring and autumn routes combined. The main migration routes are known fairly well.
 - k. Velvet Scoter, an example of high resolution, weighted map from East Denmark.
28. The Workshop agreed that the maps presented at the workshop are drafts and that background information, including estimation of the confidence, will be included as a capture to each map in the report document.
 29. The Workshop agreed to provide supporting information for the example maps delineating the expert information used when producing the figures after the end of the workshop, do that these can be presented together with the maps to State and Conservation 10-2019. The Workshop emphasized the importance of always presenting the supporting information with the spatial information.
 30. The Workshop agreed that the Secretariat will produce a template for needed background information for all maps presented at the workshop and send them to the workshop participants to complete. The Workshop noted that publication of the data underlying the maps is not mandatory, but that the data source has to be included to the metadata of the maps

Conclusions

31. The Workshop emphasized that in their current form the maps are not ready to be used for planning, but that they represent examples of what can be produced with significantly higher quality, given more time and resources.
32. The Workshop agreed that as a first step a common data form and methodology for producing the maps should be developed. The work to elaborate a common data form should be done in cooperation with representatives from national planning authorities, responsible for spatial planning and offshore windfarms to ensure that their needs are accounted for.
33. The Workshop agreed that maps produced in the Workshop and the supporting information for the maps will be made available for the State and Conservation in the form of a meeting document.
34. The Workshop agreed that, based on quality and incorporated data, the migration route maps produced for the following species can already be published in the HELCOM Map and data service: Caspian Tern, Lesser Black-backed Gull and Velvet Scoter. However these should be presented with a clear notification that these are example maps and not yet ready to be used in spatial planning. The Workshop noted that metadata will be attached to each map that will be published in the HELCOM Map and data service.
35. The Workshop highlighted that the maps produced in the workshop represent the initial steps in the process to map migration and represent the available information and the most common routes for the respective birds, but they do not mean that there are no birds migrating outside of the delineated areas. Due to lack of time, no buffers, sensitivity scores nor weighting has been added to the layers.
36. The Workshop emphasized that the produced maps focus only on the migration that takes place over the sea, migration taking place over land is not presented.
37. The Workshop noted that migration of terrestrial birds across the Baltic Sea also needs to be taken into account in spatial planning, but is out of the expertise of the present experts. The importance of migration of terrestrial birds needs to be made clear in the products of this workshop.
38. The Workshop noted that when final maps are released for the purposes of spatial planning, also lower numbers of birds need to be shown along the main routes, with weighting based on densities.
39. The Workshop emphasized that a vital part of continued work will be including dedicated experts on the needs and requirements of end users of the product, including authorities and wind industry, to ensure the products fit for purpose.
40. The Workshop noted that the final sensitivity maps should be based on multiple layers and have a geographical scale that is viable for national planning processes.

41. The Workshop agreed that separate aggregated sensitivity maps should be produced for resting areas and migratory routes but that this task is outside the scope of this work shop.
42. The Workshop considered the way forward, and discussed data deficiency and methods of regular monitoring. Tracking was highlighted as the most widely utilizable method for the maps. It was acknowledged that tracking is presently confined by very low sample size and, thus, poor representativeness of biogeographical populations.
43. The Workshop also considered ways forward to improve the quality of the maps for those species for which there is enough data available.
44. The Workshop highlighted the complexity of the work and the need to invest proper time in sorting the data and combining it in a useful way. The Workshop concluded that the planned work is a major undertaking and, in order to improve spatial and thematic coverage, additional time and financing is required. The Workshop further noted the comment by Denmark that EU has an intergovernmental forum dealing with matters concerning offshore windfarms, and that collaboration with the forum could be explored.
45. The Workshop agreed that the results produced during the workshop are a valuable start and expressed hope that HELCOM will continue the work on implementing the recommendation.
46. The Workshop suggested that a designated working group as a sub group of JWG Bird could take the work forward, and that Workshop participants will be informed about the continuation of the work.

Annex 1. List of participants

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Chair		
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Annex 2 Gaps identified by the workshop

- a) For part of the species risks of collision with offshore windfarms can be higher during foraging flights, which can be over 100 km per day, compared to migration flights, and shifts of the location in the wintering area also need to be taken into account.
- b) Further information is needed on species-specific behavior on e.g. the flying altitudes, of the migration occurring at night and day time and the numbers of birds using the routes.
- c) Gaps in data coverage include too low number and narrow spatial distribution of data for several migratory and wintering species. There is also lack of publications on bird migration in the Baltic Sea area.
- d) Need to set definitions for how to weigh the tracks.
- e) Need to set definitions for how to evaluate confidence and uncertainty.
- f) Develop structured supporting information.
- g) Need to link routes to staging areas
- h) Need for more tracking data and for the tracking efforts to be spread out across the distributional range of the species (to account for that sub-populations might have different migration behavior).
- i) For the recording devices to collect increasing number of fixes and register additional information, e.g. flight altitude.
- j) Need to broaden the spectrum to include other species etc to make the maps useful for planning purposes.
- k) Calculate the required number of taggings in order to get proper coverage for statistical analyses.
- l) More information is needed with regards to bird behavior when facing barriers or obstacles (e.g. windfarms), as well as more specific information on density and timing of migration, as well as bird behavior under varying weather conditions etc.
- m) There is a lack of expertise for the northernmost Baltic Sea area.
- n) Need to take citizen science into account, but quality-checking and quantifying the data (the effort behind the data is difficult to estimate).

Annex 3. Recommendations made by the Workshop

- a) For Contracting Parties, Lead countries, JWG BIRD etc. to initiate work in line with the gaps and recommendations identified by the workshop.
- b) Establish a designated subgroup dealing with migration (and implementation of the Recommendation) under JWG BIRD.
- c) For JWG BIRD (or possible subgroup) to identify species that are clear broad-front migrants vs. those for which tracking would yield good results.
- d) Cooperate closer with the planners, e.g. through a scoping workshop to share information, challenges and needs.
- e) That final maps should include several types of data sources.
- f) That the ultimate goal of the work should be detailed maps, also representing the sensitivity of a given area to e.g. wind power construction. These maps should be regularly updated.
- g) To map the overall level of available knowledge for each species in order to produce an overview (including whether the species is relevant for planning and why, altitude information etc.),
- h) To complement the list of species information with a non-exclusive list of non-seabird priority species.
- i) Prepare a publication of migration in the Baltic Sea, including gaps and recommendations, for submission to a scientific journal.
- j) In accordance with the Recommendation, complement the information on migration with similar information on resting birds, to be presented as separate sensitivity maps (for reasons of transparency and detail).
- k) Contracting Parties are recommended to organize coordinated projects to collect and interpret data and to ensure the data find their way into the migration maps.
- l) Identify funding possibilities for a dedicated project to support the work and look into possibility to form a consortium to prepare and submit an application.
- m) Ensure that effort is logged (hours etc) when conducting and including citizen science in the information.
- n) Joint data management on a regional level is critical for the success of the work and effort towards this goal should be prioritized.
- o) At bottleneck sites visual migration counts are important to support the migration route information and maintaining this kind of monitoring is highly encouraged.
- p) JWG BIRD (or subgroup or workshop) are recommended to produce more detailed recommendations on how to conduct monitoring of migratory birds, possibly producing best-practice guidelines.
- q) To produce more specific species maps and to produce a sensitivity map of the area aggregating the species layers.