CEMP Guideline for Marine Birds thematic assessment integration method

OSPAR Agreement 2023-04[1]

1 Introduction

Status assessments of marine birds contributing to OSPAR Quality Status Reports build on the monitoring of different aspects of marine birds and their ecological condition, called criteria in the Marine Strategy Framework Directive (MSFD) (**Table 1**). Assessments are done on the level of both species / population (called element in MSFD) and functional species group (called features in MSFD). Marine birds are allocated to five functional groups, which are defined on the basis of the species' mode of feeding (**Table 2**). These functional groups were proposed by the Joint OSPAR/HELCOM/ICES Expert Group on Seabirds (JWGBIRD) (ICES 2014) and have been adopted in the EU Commission Decision (2017/848).

Indicators representing the criteria are used to convert monitoring data to status assessments of species/ population, which serve as elements of the assessment.

***Table 1**: MSFD Article 8 Biodiversity Criteria for Marine Birds (Descriptor 1) and relevant OSPAR Indicators*

Criteria	Description	Relevant OSPAR Indicator
D1C1 (bycatch)	The number of birds bycaught in fisheries does / does not allow to recover or maintain the population size.	B5 - Marine bird bycatch See QSR 2023 pilot assessment for details: https://oap.ospar.org/en/ospar-assessments/quality-status-reports/qsr-2023/indicator-assessments/marine-bird-bycatch-pilot/
D1C2 (abundance)	The population size is decreasing / stable / increasing.	B1 - Marine bird abundance See B1 OSPAR CEMP Guidelines and QS3 2023 Offshore extension pilot assessment for details: https://oap.ospar.org/en/ospar-

[1] English only

		assessments/quality-status-reports/qsr-2023/indicator-assessments/bird-abundance-pilot/
D1C3 (demography)	The reproductive success does / does not allow to recover or maintain the population size.	B3 - Marine bird breeding productivity See B3 OSPAR CEMP Guidelines for details
D1C4 (distribution)	The distributional range is decreasing / stable / increasing / changing.	Not available
D1C5 (habitat for the species)	Bird habitat is lost /disturbed due to human activities.	B7 - Marine bird habitat quality See QSR 2023 pilot assessment for details: https://oap.ospar.org/en/ospar-assessments/quality-status-reports/qsr-2023/indicator-assessments/marine-bird-habitat-quality-pilot/

***Table 2**: Marine bird functional groups*

Functional group	**Typical feeding behaviour**	**Typical food types**	**Additional guidance**
Surface feeders	Feed within the surface layer (within 1–2 m of the surface)	Small fish, zooplankton and other invertebrates	"Surface layer" defined in relation to normal diving depth of plunge-divers (except gannets)
Water column feeders	Feed at a broad depth range in the water column	Pelagic and demersal fish and invertebrates (e.g. squid, zooplankton)	Include only spp. that usually dive by actively swimming underwater; but including gannets. Includes species feeding on benthic fish (e.g. flatfish).
Benthic feeders	Feed on the seafloor	Invertebrates (e.g. molluscs, echinoderms)	
Wading feeders	Walk/wade in shallow waters	Invertebrates (molluscs, polychaetes, etc.)	
Grazing feeders	Grazing in intertidal areas and in shallow waters	Plants (e.g. eelgrass, saltmarsh plants), algae	Geese and dabbling ducks

2 Description of the integration method

2.1 Overview of the approach

The status of a marine bird species (or population) is derived from the integration of the outcomes of different indicators. Species should be representative of the species group and their ecosystem functioning but should also be relevant for the assessment of anthropogenic pressure. The set of species selected per species group should cover, as far as possible, the full range of ecological functions of the species group. As each species has its role in the ecosystem, there is no reason to omit a species from the assessment. If a species occurs in an assessment area with two or more populations,

e.g. when breeding birds and wintering birds from the same species do not belong to the same population, these are assessed separately.

The status of a species group can be found by the integration of the status of the associated species. The approach for integration is based on two steps:

1) from criteria results to individual species / population status,
2) from individual species / population status to species group status.

Such an approach for OSPAR QSR corresponds to the procedure used in the MSFD, and the following instructions are in line with the Article 8 MSFD Assessment Guidance (European Commission 2022). An overview of the procedure of integration is given in **Figure 1**.

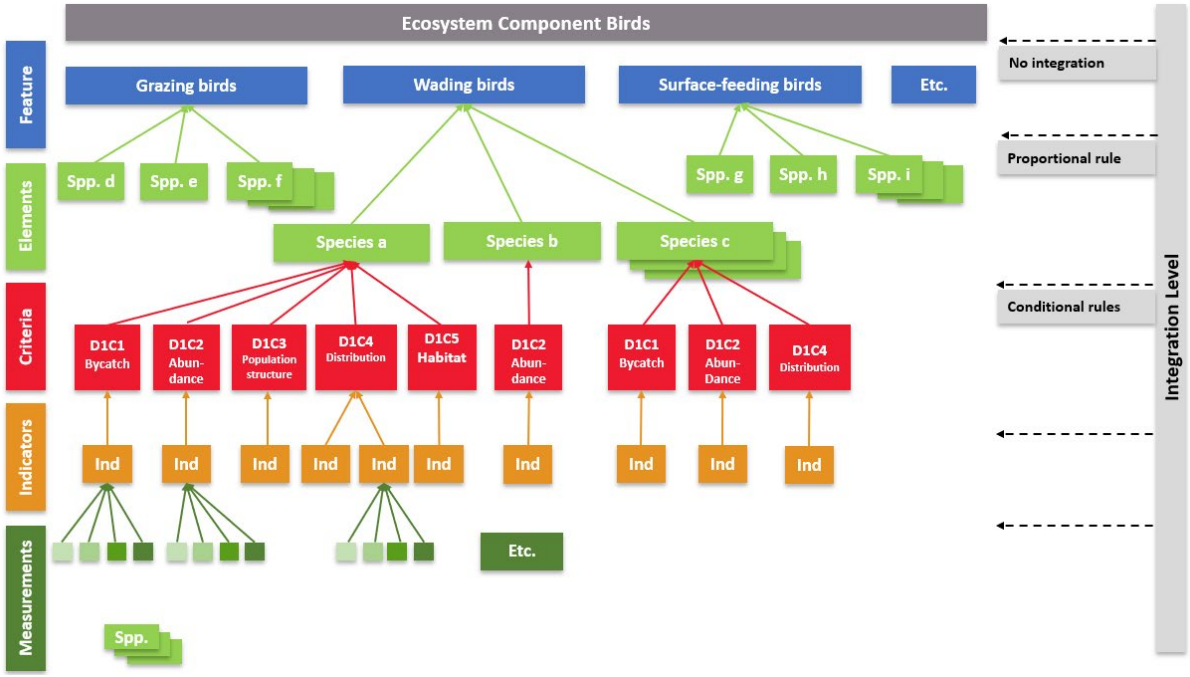

Figure 1. *Levels and methods of integration for marine birds.*

2.2 Integration from criteria to species status

Marine bird indicators already adopted, under development or envisaged can be assigned to five criteria, which are defined for Article 8 assessments of biodiversity (Descriptor 1) in MSFD (**Table 1**). In line with the Article 8 MSFD Assessment Guidance, criteria shall be integrated by the application of conditional rules as depicted in **Figure 2** for each species / population (see also **Table 3**, assessment scenario A). These rules acknowledge the high informative value of the criteria of by-catch, abundance and demography, which are directly informative of the prospects of a population, and use the criteria of distribution and habitat for the species as additional decision support factors (as these criteria

reflect the environmental conditions for a population). The rationale behind these rules is described in a Joint Research Centre report (Dierschke et al. 2021).

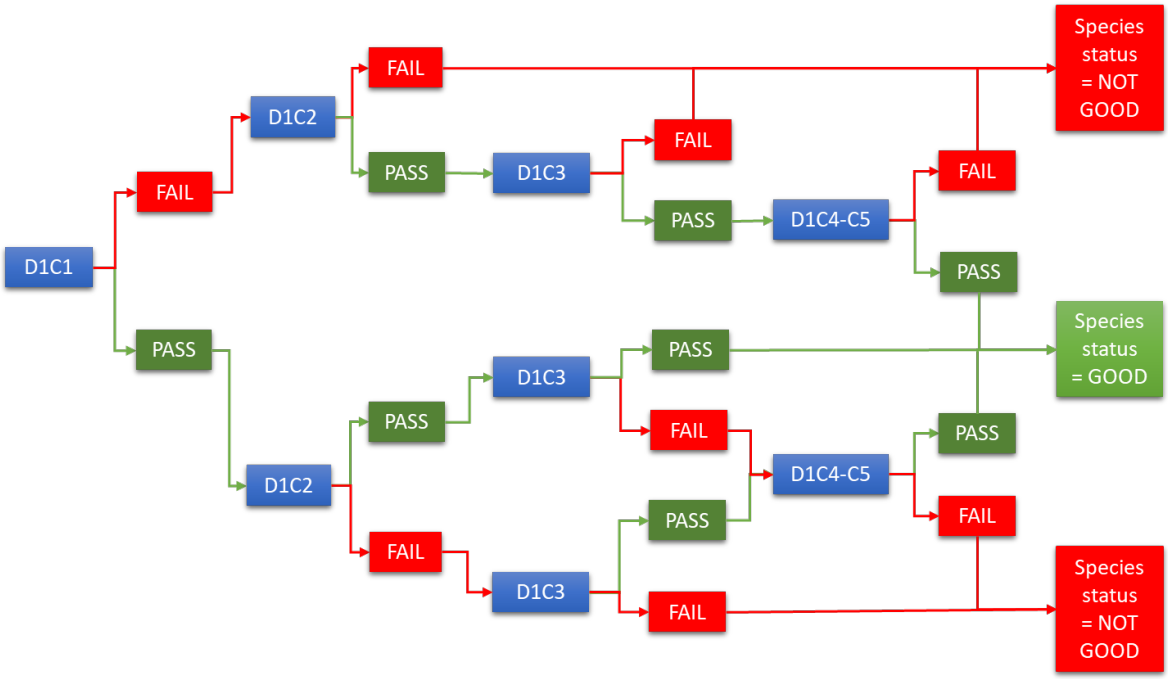

Figure 2. *Conditional rules for integrating criteria to assess the status of a marine bird species (taken from Dierschke et al. 2021 and European Commission 2022). Criteria: D1C1 bycatch, D1C2 abundance, D1C3 demography, D1C4 distribution, D1C5 habitat for the species. FAIL = Species does not reach criterion (indicator) specific threshold values; PASS = Species does reach the criterion (indicator) specific threshold values. The figure shows the ideal scenario in which all criteria are applicable as presented in the scenario A included in* ***Table 3****.*

If not all criteria are applicable to a species / population or cannot be assessed, the conditional rules must be modified. Table 3 shows assessment scenarios which represent possible availability of indicator results:

Scenario A) This is the ideal case in which indicators exists for all criteria that are therefore applicable for integration.

Scenario B) In this scenario the criterion D1C1 (by-catch) is not applicable. Populations are in good status if at least one primary criterion (D1C2, D1C3) AND one secondary criterion (D1C4, D1C5) are in good status. This scenario is often applicable to breeding birds because by-catch is either not relevant or not occurring during the breeding season.

Scenario C) in this scenario the criterion D1C3 (demography) is not applicable. In this scenario a population is in good status if at least two criteria are in good status. This scenario is relevant to wintering birds, for which indicators of breeding productivity cannot be calculated.

In the case of missing data to assess a criterion, the Contracting Parties should act on monitoring and assessment tools to ensure that an assessment can be undertaken at the next update of the Quality Status Report.

Table 3. *Guide to integrating assessments from criteria to species status (see also Figure 3). Assessment scenario A shows the application of the conditional rules in the ideal case that all criteria are applicable. In practice, information may not be available for all criteria, therefore typical constellations for breeding birds (Assessment scenario B) and wintering birds (Assessment scenario C) are also shown. Each numbered column in the table represents a possible combination of indicator results for the criteria that can be assessed under the different scenarios, with information on what would be the resulting species status. Legend: N: criterion fails to achieve threshold value; Y: criterion meets threshold value; O: missing data or reference level but criterion relevant to assessment, NA: not applicable, criterion result irrelevant to assessment. In species at risk from incidental by-catch, missing data for criterion D1C1 are treated differently for species in the OSPAR List of Threatened and Declining Species and Habitats (O**) and those not listed there (O*). Taken from European Commission (2022).*

Assessment scenario A											
Criterion	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
D1C1	Y	Y	Y	Y	Y	N	N	Y	N	N	N
D1C2	Y	N	N	Y	Y	Y	Y	N	Y	N	N
D1C3	Y	Y	Y	N	N	Y	Y	N	N	Y	N
D1C4 and D1C5 combined	Y or N	Y	N	Y	N	Y	N	Y or N	Y or N	Y or N	Y or N
Species status	Good	Good	Not good	Good	Not good	Good	Not good	Not good	Not good	Not good	Not good

	Assessment scenario B						
Criterion	**12**	**13**	**14**	**15**	**16**	**17**	**18**
D1C2	Y	N	N	Y	Y	N	N
D1C3	Y	Y	Y, O or NA	N, O or NA	N, O or NA	N	O or NA
D1C4 and D1C5 combined	Y, N, O or NA	Y	N, O or NA	Y, O or NA	N	Y, N, O or NA	Y
Species status	Good	Good	Not good	Good	Not good	Not good	Not good

	Assessment scenario C			
Criterion	**19**	**20**	**21**	**22**
D1C1	Y, NA or O (*)	Y, NA or O (*)	Y, NA or O (*)	N or O (**)
D1C2	Y	N or O	N	Y or N
D1C4 and D1C5 combined	Y or N	Y	N or O	Y or N
Species status	Good	Good	Not good	Not good

In preparation of QSR 2023, the OSPAR Biodiversity Committee agreed not to include candidate indicators in the integration for the marine birds thematic assessment (BDC 22/9/1 §3.7a).

This meant that the QSR 2023 integrated assessment can only build on two OSPAR Common Indicators: Marine Bird Abundance (B1) and Marine Bird Breeding Productivity (B3). Therefore, the conditional rules as depicted in Figure 2 and Table 3 cannot be executed in their entirety and were adapted as follows:

- Populations with two indicator assessments are in good status if both indicators achieve the threshold.
- Populations with just one indicator assessment are in good status only if the respective indicator achieve the threshold.

Thus, it is recommended to use a "One-Out-All-Out" approach for species / populations which are assessed in terms of abundance (indicator B1, criterion D1C2) and breeding productivity (B3, D1C3). Poor status in the breeding productivity indicator (B3) means that the currently observed level of breeding productivity would lead to a decrease in population size by more than 30% over the next three generations, i.e., the population would be "Vulnerable" according to IUCN criteria. On the other hand, even if the current level of breeding productivity would indicate a better status, a low population size alone (indicator B1) would indicate poor status.

2.3 Integration from species status to species group status

If at least five species (or populations) of a species group can be assessed, the following proportional rule shall be applied: If 75 % of all species (or populations) are in good status then the species group is considered to be in good status (**Figure 3**).

According to the Article 8 MSFD Assessment Guidance (European Commission 2022), ideally all known species or populations within a functional group should be considered for this integration step, thus the 75% should also include species or populations not assessed. The inclusion of species / populations not assessed (which are treated as not being in good status) for the calculation of the 75% proportion is suggested to prevent that only a selection of species is considered for monitoring and assessment of a species group.

Such recommendation could not be applied for the OSPAR QSR 2023 as the Article 8 Guidance was published on a late stage of the analyses (May 2022) and especially because an agreed list of species to consider for an assessment is not currently available. For these reasons, in the QSR 2023 the 75% proportion was calculated only on the species assessed. It would be recommended for JWGBIRD to produce an agreed species list for each species group (ideally for each OSPAR Region separately) to better align future assessments with the recommendations detailed in the Article 8 Guidance.

The 75 % threshold was developed for the OSPAR EcoQO (Ecological Quality Objective) on seabird population trends (ICES, 2011) and is recommended for use by Humphreys et al. (2012). If fewer than five species (or populations) are assessed in a species group, then One-Out-All-Out is applied, i.e., to achieve good status of the species group all species / populations must be in good status.

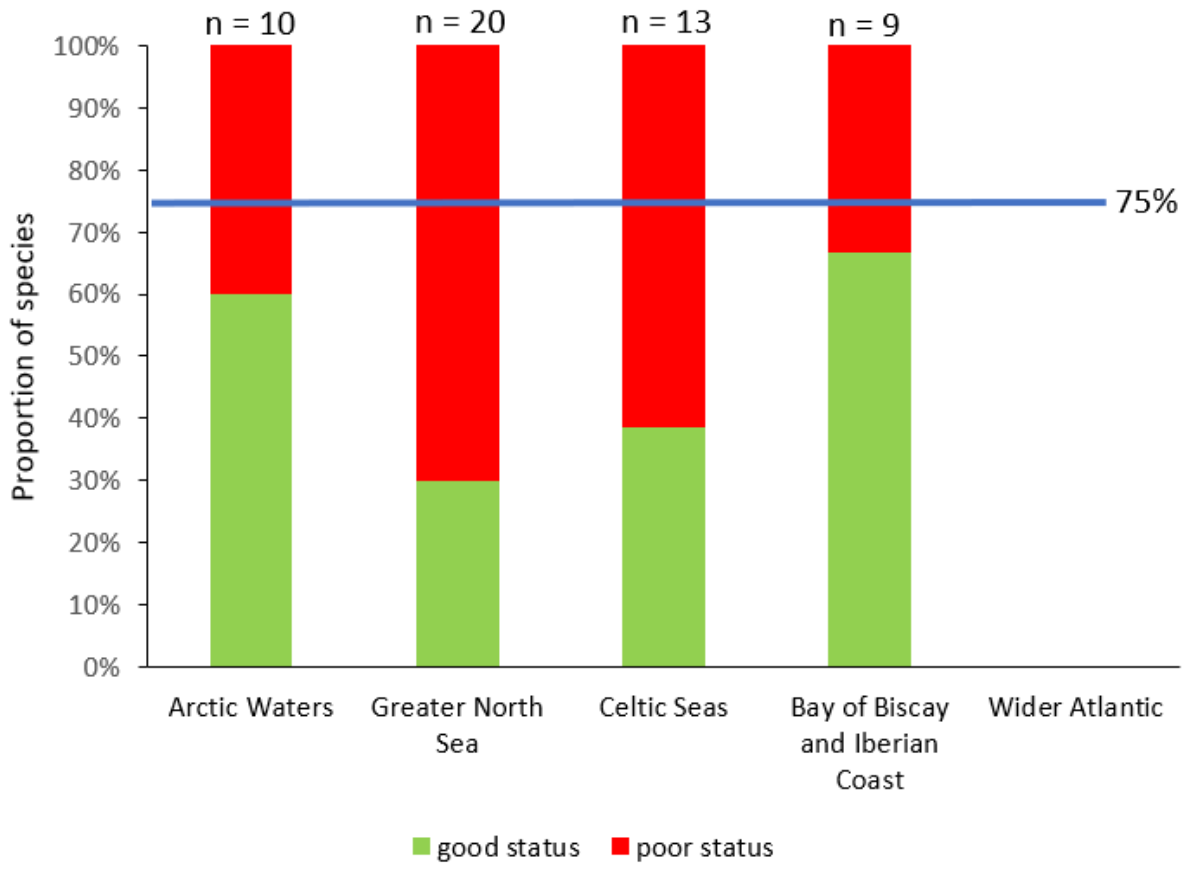

Figure 3. *Summarised results for the integrated assessments of surface-feeding marine birds. N = number of surface-feeding species assessed in each OSPAR Region. 75% of species in good status is the threshold for good status of a species group.*

2.4 Voluntary integration from species group to ecosystem component

This integration step is not required in MSFD assessments, but presenting the status of marine birds as an ecosystem component may help with the presentation of assessment results to policy-makers and the public. It is considered that no species group can replace another species group in the ecosystem, because each species group is representing a particular functional role in the marine ecosystem. Therefore, it is suggested that an ecosystem component cannot be in good status if one or more of the assessed species groups are considered to be in not good status.

2.5 Description of the assessment units being applied

For the OSPAR QSR 2023, integrated assessments are conducted on the spatial scale of the five OSPAR Regions: Arctic Waters, Greater North Sea, Celtic Seas, Bay of Biscay and Iberian Coast, and Wider Atlantic (**Figure 4**). This is due to the fact that one of the two common indicators available for the integration (Marine Bird Breeding Productivity B3) cannot be applied at subdivision scale due to the limited data available at this spatial resolution. In the future it might be possible to have integrated

assessments at subdivision scale if more data become available to apply all relevant indicators at such scale.

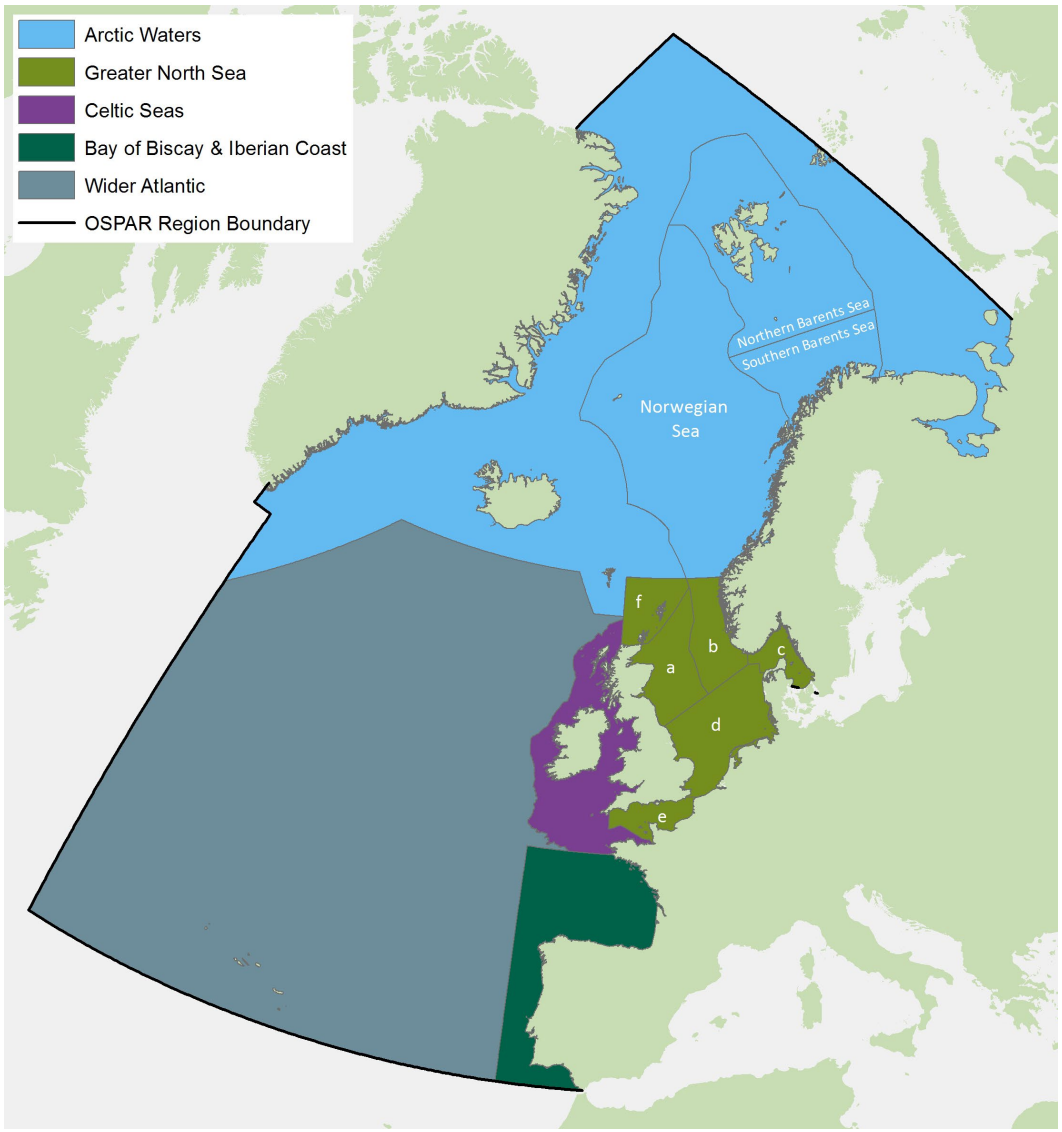

Figure 4: *Assessment units for marine bird integrated assessments. Greater North Sea sub-divisions: a) North-East coast of Britain, b) West coast of Norway, c) Skagerrak and Kattegat, d) Southern North Sea, e) English Channel, f) North coast of Scotland and the Northern Isles*

2.6 Presentation of results

The output of the integrated assessment is presented for each OSPAR Region in a comprehensive table displaying the status of each species / population by criterion, the overall status of each species / population after integration of criteria and the overall status of the species group after integration from species / population status (see example in **Table 4**).

In addition, a summary can be provided in a graphical format for the individual species groups, preferably also showing the distance to the threshold value (see example in **Figure 3**).

Table 4. *Summarised results of the abundance (B1) and breeding productivity (B3) assessments and the integration to status of species (or populations) for breeding (B) and non-breeding *(NB) populations. Green: indicator threshold achieved / status good and red: indicator threshold not achieved / status not good. * refers to results from POSH assessments.*

	Surface feeders	Arctic Waters			Greater North Sea			Celtic Seas			Bay of Biscay and Iberian Coast		
		Region I			Region II			Region III			Region IV		
		B1	B3	Status	B1	B3	Status	B1	B3	Status	B1	B3	Status
B	*Black-legged kittiwake*			not good			not good			not good			not good
B	Black-headed gull						not good			not good			good
NB	Black-headed gull						good						
B	Mediterranean gull												good
B	Common gull						not good			good			
NB	Common gull			good			good						
B	Great black-backed gull			good			not good			good			good
NB	Great black-backed gull			not good			not good						
B	European herring gull			good			not good			not good			not good
NB	European herring gull			good			not good						
B	Lesser black-backed gull			good			not good			not good			good
NB	Lesser black-backed gull						good						
B	*Lesser black-backed gull (subspecies fuscus)*			not good*									
B	Sandwich tern						good			good			good
B	Little tern						good			good			
B	*Roseate tern*						good						
B	Common tern						not good			not good			good
B	Arctic tern						not good			not good			
B	Great skua			good			not good			good			
B	Arctic skua						not good						
B	Northern fulmar			not good			not good			not good			
NB	*Balearic Shearwater*						not good*			not good*			not good*
	Number of species in good status			**6**			**6**			**5**			**6**
	Number of species not in good status			**4**			**14**			**8**			**3**
	Proportion of species in good status			**60%**			**30%**			**38%**			**67%**
	State of species group			**not good**			**not good**			**not good**			**not good**

2.7 Confidence assessment

While individual indicators discuss data quality and include confidence intervals in their assessments of species, there is no statistical approach to combine uncertainties from indicators during integration to the level of species groups. Until a statistical framework is developed for expressing confidence of species group assessments, as a minimum a qualitative approach should be applied by experts, following the confidence statements guidance for QSR 2023.

3 Change Management

Applicability and validity of the integration methods will be reviewed and developed further by marine bird experts in JWGBIRD. If necessary, this will be done on request from ICG-COBAM or BDC, who in turn decide on the acceptance of the proposals. Uniformity of integration methods for assessments by OSPAR, HELCOM and ICES will be sought.

4 References

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Humphreys EM, Risely K, Austin GE, Johnston A and Burton NHK 2012. Development of MSFD Indicators, Baselines and Targets for Population Size and Distribution of Marine Birds in the UK. BTO Research Report No. 626.

ICES 2011. Report of the Working Group on Seabird Ecology (WGSE), 1–4 November 2011, Madeira, Portugal. ICES CM 2011/SSGEF:07, 87 pp.