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TABLE OF CONTENT

1. Summary	4
2. Introduction	5
3. Materials and methods	6
Annex 1 habitats and Annex 2 species at the Vlakte van de Raan (SCI)	6
Annex 1 habitats	6
Annex 2 species	7
Data availability	7
Annex 1 habitats	7
Annex 2 species	7
Analytical strategy	8
Representativeness	8
Conservation status and recovery potential	8
Surface area	9
Conservation value	9
4. Evaluation of the Annex 1 Habitat types at the Vlakte van de Raan SCI	10
Habitat type 1110 at the Vlakte van de Raan SCI	10
Representativeness and surface area	10
Ecological value and surface area	10
Conservation value	12
Habitat type 1170, <i>Lanice conchilega</i> aggregations at the Vlakte van de Raan SCI	12
Representativeness, surface area and ecological value	12
Conservation value	13
5. Evaluation of the Annex 2 species at the Vlakte Van de Raan SCI	14
Harbour porpoise <i>Phocoena phocoena</i>	14
Representativeness, surface area , ecological and conservation value	14
Twait shad <i>Alosa fallax</i>	14
Representativeness, surface area and ecological value	14
Conservation value	15
6. Conclusion	16
7. References	17

1. SUMMARY

Based on the best available knowledge, the current study analysed the habitats' and species' conservation value for the specific delineated Vlakte van de Raan Site of Community Interest (SCI) in the Belgian part of the North Sea (BPNS). The habitat types 1110 and 1170 and the species *Phocoena phocoena* and *Alosa fallax* were analysed for the 19km² Vlakte van de Raan SCI. These analyses are based on the criteria: representativeness, conservation status, recovery potential, surface area and conservation value.

The Habitat type 1110 at the Vlakte van de Raan SCI turns out to be a mosaic of areas of poor and medium ecological value, interspersed with some elements of high ecological value (i.e. part of the *Abra alba* biotope). The combined surface area is negligible compared to the Vlaamse Banken SCI or the total surface of the BPNS, indicating a low conservation value. The ecological value of the Habitat type 1170 at the Vlakte van de Raan SCI scores very low, indicating no conservation value for this habitat type.

For the harbour porpoise *Phocoena phocoena*, the Vlakte van de Raan area shows the lowest densities found in Belgian waters, leading to the conclusion that the ecological value of the Vlakte van de Raan SCI for harbour porpoise is to be considered negligible.

Twait shad *Alosa fallax* is known to occur within the Vlakte van de Raan SCI (data from 1 beam trawl sample in the area). However, taking into account the different scientific criteria, the ecological value of the Vlakte van de Raan SCI for *A. fallax* is to be considered anecdotal and its conservation value as negligible. Any conservation measure within the Vlakte van de Raan SCI will be ineffective for this migrating species.

In conclusion, based on different criteria, the scientific analysis shows very poor to no nature conservation value for the habitat types and species for which the site was initially proposed, leading to the conclusion that the Vlakte van de Raan SCI has no value as a special area for conservation.

2. INTRODUCTION

Based on the arrest of the Council of State¹ and the scientific studies Degraer et al. (2009, 2014), there were indications that there was little scientific evidence to underpin the delineation of the Vlakte van de Raan Site of Community Interest (SCI) in the Belgian part of the North Sea (BPNS).

The scientific information gathered and presented in reports so far show that the full sand bank area Vlakte van de Raan, of which the delineated SCI is a small part, does not have the most interesting nature conservation value. However, till today no study exists that examines the Vlakte van de Raan SCI as it appears on the European list of SCIs of 12 December 2008 (2009/96/EG). This means that there is actually no scientific evidence about the conservation value² for one or more habitat types or Annex 2 species for which the Vlakte van de Raan SCI was initially delineated.

The current study therefore analyses all habitats' and species' conservation value for the specific delineated site. The scientific analysis performed in this study aims at defining, based on the best available knowledge, the nature conservation value for any of the habitat types or species for which it was initially proposed.

¹ number 179.254 of 1 February 2008

² Conservation value is defined as the potential to take appropriate measures to increase the habitat's quality or protect the species population status.

3. MATERIALS AND METHODS

This study focuses on the small part of the larger Vlake van de Raan sand bank that has been delineated as the Vlake van de Raan SCI, and more specifically evaluates its nature conservation value within the framework of the Habitats Directive for which it has been delineated.

The report builds on the following scientific studies:

1. Degraer et al. (2009), proposing the delineation of the Vlaamse Banken SCI.
2. Degraer et al. (2014), evaluating the ecological value of the larger Vlake van de Raan sandbank

ANNEX 1 HABITATS AND ANNEX 2 SPECIES AT THE VLAKTE VAN DE RAAN (SCI)

Annex 1 habitats

In the BPNS, only Habitat type 1110 “Shallow sandbanks permanently covered with water” and Habitat type 1170 “Reefs” occur (Degraer et al., 2009). Within the latter habitat type, two subcategories were distinguished: i.e. gravel beds and *Lanice conchilega* aggregations. Exploring the spatial distribution of these habitat types, Degraer et al. (2009) demonstrated that the larger Vlake van de Raan sandbank:

1. constitutes mainly of Habitat type 1110 (Figure 3.a)
2. does not host Habitat type 1170, subcategory gravel beds (Figure 3.b)
3. most likely hosts Habitat type 1170, subcategory *Lanice conchilega* aggregations (Figure 3.c)

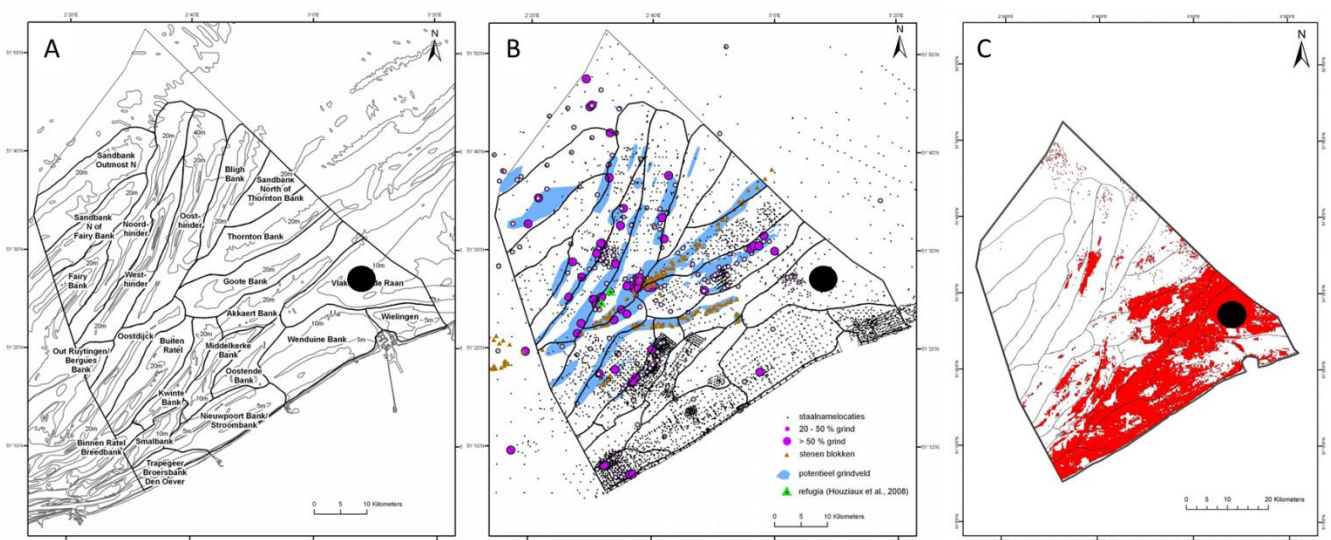


Figure 1. Belgian part of the North Sea, with a black dot indicating the position of the larger Vlake van de Raan sandbank. A. delineation of Habitat type 1110 sandbanks, B. potential spatial distribution of Habitat type 1170, subcategory gravel beds, C. modelled spatial distribution of the Habitat type 1170, subcategory *Lanice conchilega* aggregations (after Degraer et al., 2009).

In conclusion, the larger Vlakte van de Raan sandbank, and thus the smaller Vlakte van de Raan SCI:

1. belongs to Habitat type 1110 and
2. most likely contains Habitat type 1170, subcategory *Lanice conchilega* aggregations.

Annex 2 species

Of the Habitat Directive Annex II species, only two species are of importance in Belgian waters and hence possibly also in the Vlakte van de Raan SCI, i.e. twait shad *Alosa fallax* and the harbour porpoise *Phocoena phocoena* (Degraer et al. 2009).

In conclusion, twait shad *Alosa fallax* and harbour porpoise *Phocoena phocoena* are possibly relevant to the Vlakte van de Raan SCI.

DATA AVAILABILITY

Annex 1 habitats

Benthos data available in the Vlakte van de Raan SCI are restricted to four macrobenthos samples and one beam trawl track (data: ILVO-fisheries). Given the poor data availability, we used habitat suitability (Degraer et al., 2008) as a proxy for the likelihood of (potentially) well-developed benthic biotopes as habitat type 1110 and *L. conchilega* aggregations as habitat type 1170 (see: analytical strategy).

Annex 2 species

Harbour porpoise *Phocoena phocoena*

To assess the spatial patterns in the importance of the BPNS to harbour porpoises, data collected during aerial surveys executed between 2009 and 2014 were used. These data were integrated into a grid with 10 x 10 km cells covering the full BPNS. The spatial resolution takes account of the high mobility of the species and still provides the opportunity to detect spatial patterns at the BPNS. For more information: see Degraer et al. (2014).

Twait shad *Alosa fallax*

To differentiate spatial patterns in the spatial distribution of twait shad, maximum densities of twait shad densities were laid out in a 3 x 3 km grid spanning the full BPNS. The data are derived from the ILVO fisheries monitoring in spring (February-March 2005-2014), which however is the outside the

optimal period for observing twait shad (April-June). The data analysis may as such underestimate the true spatial distribution or densities of twait shad in Belgian waters. The autumn fisheries campaigns of ILVO never detected twait shad.

ANALYTICAL STRATEGY

The conservation value of the Vlakte van de Raan SCI is assessed based on the representativeness of the relevant Annex 1 habitats and Annex 2 species, the habitat's and species population's conservation status and recovery potential, the surface area occupied by the habitat and territory occupied by the species, and the habitat's or species' conservation value relative to the habitat types' or species' status in the BPNS. The assessment features are interpreted as follows:

Representativeness

The BPNS is considered to be composed of Habitat type 1110 for the major part of its total surface area (Degraer et al. 2009). Within Habitat type 1110 four biotopes can be distinguished. These biotopes are based on the spatial distribution of macrobenthic communities in the BPNS (Van Hoey et al., 2004). Degraer et al. (2009) argued that these biotopes can be used as the basic units for evaluating the representativeness of Habitat type 1110.

Regarding Annex 2 species, representativeness is assessed based on the density of Annex 2 species (i.e. twait shad and harbour porpoise) at the Vlakte van de Raan SCI.

Ecological value and recovery potential

Given the poor data availability for Annex 1 habitat types and its biotopes, the conservation status and its recovery potential at the biotope level cannot be assessed based on *in situ* samples. These are therefore assessed based on habitat suitability for the four biotopes (Degraer et al., 2009). Habitat suitability was used as a proxy for the likelihood of (potentially) well-developed biotopes. Higher habitat suitability scores indicate a sedimentary environment that is well suited for the development of the respective macrobenthic community. We may hence assume that high suitability values correspond to areas with a high potential for hosting a representative and well-developed community. Their ecological value potential may hence be considered high, provided anthropogenic stressors do not hamper the community to develop to its climax condition.

For Annex 2 species, conservation status and recovery potential are again assessed based on the density with which Annex 2 species occur in the Vlakte van de Raan SCI (similar to representativeness).

Surface area

For Annex 1 habitat types, the surface area of high-potential was calculated as the surface area occupied by high suitability values (i.e. >80 %) at the Vlakte van de Raan SCI, compared to the Vlaamse Banken SCI and the remainder of the BPNS.

For Annex 2 species, the surface area could not be calculated, given the anecdotic data at the base of the assessment of the only Annex 2 species (i.e. twait shad *A. fallax*, see below) relevant to the Vlakte van de Raan SCI.

Conservation value

In case of, and only in case of the detection of a significant ecological value (see: Conservation status and recovery potential), the conservation value of the Annex 1 habitats or Annex 2 species was assessed. Conservation value is here defined as the potential to take appropriate measures to increase the habitat's quality or to protect the species population status.

4. EVALUATION OF THE ANNEX 1 HABITAT TYPES AT THE VLAKTE VAN DE RAAN SCI

HABITAT TYPE 1110 AT THE VLAKTE VAN DE RAAN SCI

Representativeness and surface area

While evaluating the ecological value of the Habitat type 1110 in the BPNS, Degraer et al. (2009) distinguished four benthic biotopes: the *Macoma balthica*, the *Abra alba*, the *Nephtys cirrosa* and the *Ophelia borealis* biotopes, all corresponding to specific sedimentary conditions (Van Hoey et al., 2004). Applying the habitat suitability model of Degraer et al. (2008), the Vlakte van de Raan SCI is predicted to be dominated by the *A. alba* biotope (15 km²) and the *N. cirrosa* biotope (5 km²) (Figure 2). The *M. balthica* biotope is only marginally predicted (1 km²) and may hence be disregarded when assessing the ecological value of the Vlakte van de Raan SCI.

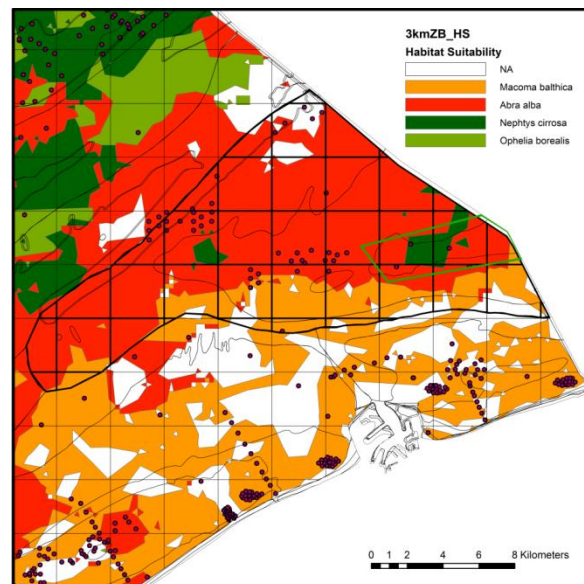


Figure 2. Modelled spatial distribution of the benthic biotopes at the larger Vlakte van de Raan sandbank (black polygon) and the Vlakte van de Raan SCI (green polygon). Orange, *Macoma balthica* biotope; red, *Abra alba* biotope; dark green, *Nephtys cirrosa* biotope.

Ecological value and surface area

Abra alba biotope

The habitat suitability of the *A. alba* biotope at the Vlakte van de Raan SCI varies between 47 and 88 % (average: 76 %), which is relatively high compared to the BPNS (25-88 %, average: 69 %) and the Vlaamse Banken SCI (25-88 %, average: 67 %) (Figure 3). The Vlakte van de Raan however only

comprises 8 km² of top (> 80 %) *A. alba* suitability values, compared to 48 km² at the Vlaamse Banken SCI and 98 km² at the rest of the BPNS.

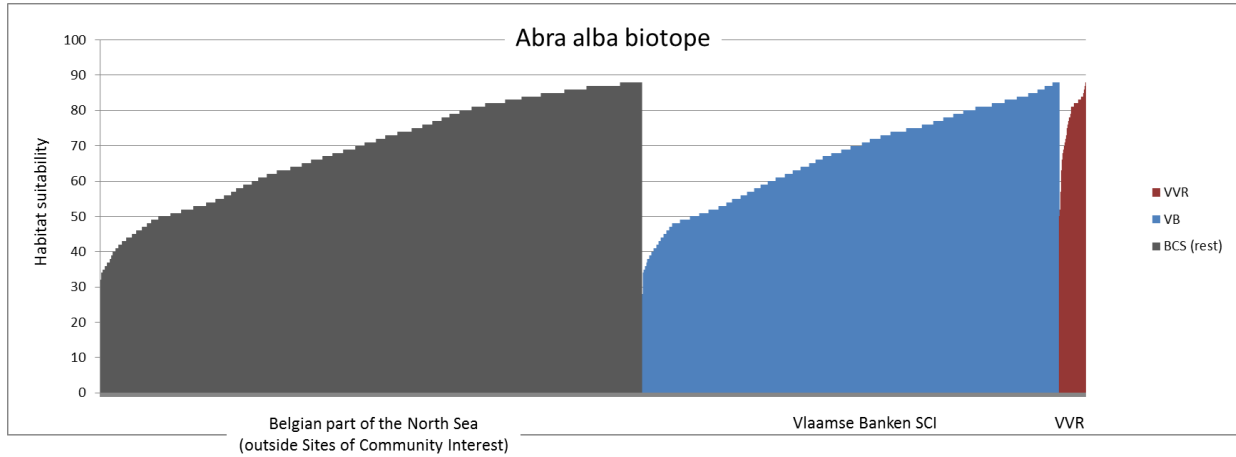


Figure 3. *Abra alba* biotope habitat suitability frequency distribution (ordered from low to high suitability; gridcells 250 x250 m) in the Belgian part of the North Sea outside the Sites of Community Interest (SCI, grey), the Vlaamse Banken SCI (blue) and the Vlakte van de Raan SCI (VVR, red).

Nephtys cirrosa biotope

The habitat suitability of the *N. cirrosa* biotope at the Vlakte van de Raan SCI varies between 45 % and 57 % (average: 53 %), which is low compared to the Vlaamse Banken SCI (25-91%, average: 61 %) and the rest of the BPNS (25-92 %, average: 55%) (Figure 4). The Vlakte van de Raan SCI does not have suitabilities >80 %, while 27 km² and 20 km² of top suitability values were detected at the Vlaamse Banken SCI and the remainder of the BPNS, respectively.

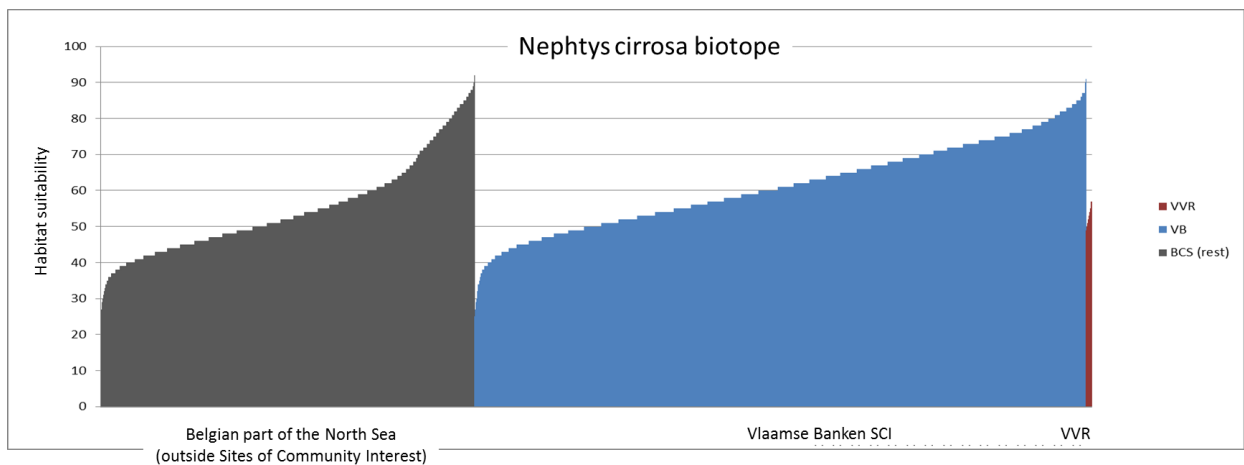


Figure 4. *Nephtys cirrosa* biotope habitat suitability frequency distribution (ordered from low to high suitability; gridcells 250 x250 m) in the Belgian part of the North Sea outside the Sites of Community Interest (SCI, grey), the Vlaamse Banken SCI (blue) and the Vlakte van de Raan SCI (VVR, red).

Conservation value

Given the low to medium ecological value of the Vlakte van de Raan 1110 habitat type, its conservation value was not assessed.

In conclusion, while the Habitat type 1110 ecological value at the Vlakte van de Raan SCI scores relatively high for the *Abra alba* biotope, this high value is not flanked by high values for the *Nephtys cirrosa* biotope. The Habitat type 1110 at the Vlakte van de Raan SCI should hence be considered as a mosaic of areas of poor to medium ecological value, interspersed with some elements of high ecological value (being the *Abra alba* biotope).

HABITAT TYPE 1170, *LANICE CONCHILEGA* AGGREGATIONS AT THE VLAKTE VAN DE RAAN SCI

Representativeness, surface area and ecological value

The habitat suitability for *L. conchilega* aggregations at the Vlakte van de Raan SCI varies between 23 % and 57 % (average: 49 %), which falls within the suitability range of the Vlaamse Banken SCI (23-91 %, average: 52 %) and BPNS (23-92 %, average: 43 %) (Figure 4). The latter areas however clearly show higher maxima than the Vlakte van de Raan SCI: the Vlakte van de Raan SCI does not have suitability values >80 %, while 27 km² and 20 km² of top suitability values were detected at the Vlaamse Banken SCI and BPNS, respectively.

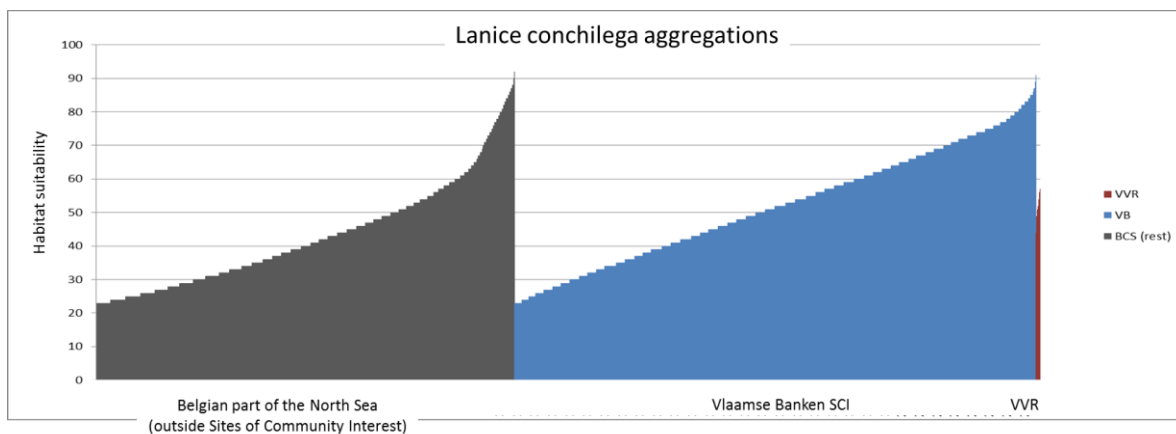


Figure 5. *Lanice conchilega* aggregation habitat suitability frequency distribution (ordered from low to high suitability; gridcells 250 x250 m) in the Belgian part of the North Sea outside the Sites of Community Interest (SCI, grey), the Vlaamse Banken SCI (blue) and the Vlakte van de Raan SCI (VVR, red).

Conservation value

Given the low ecological value of the Vlake van de Raan 1170 habitat type, the conservation value *L. conchilega* aggregations was not assessed.

In conclusion, the ecological value of the Habitat type 1170 at the Vlake van de Raan SCI scores low, with only lower habitat suitability values for *Lanice conchilega* aggregations.

5. EVALUATION OF THE ANNEX 2 SPECIES AT THE VLAKTE VAN DE RAAN SCI

HARBOUR PORPOISE *PHOCOENA PHOCOENA*

Representativeness, surface area , ecological and conservation value

Degraer et al. (2014) showed that the average density of harbour porpoises per gridcell of 10 x 10 km in the larger Vlake van de Raan sandbank (about 0.2 ind./km²) is the lowest found in the BPNS (up to about 3.6 km²).

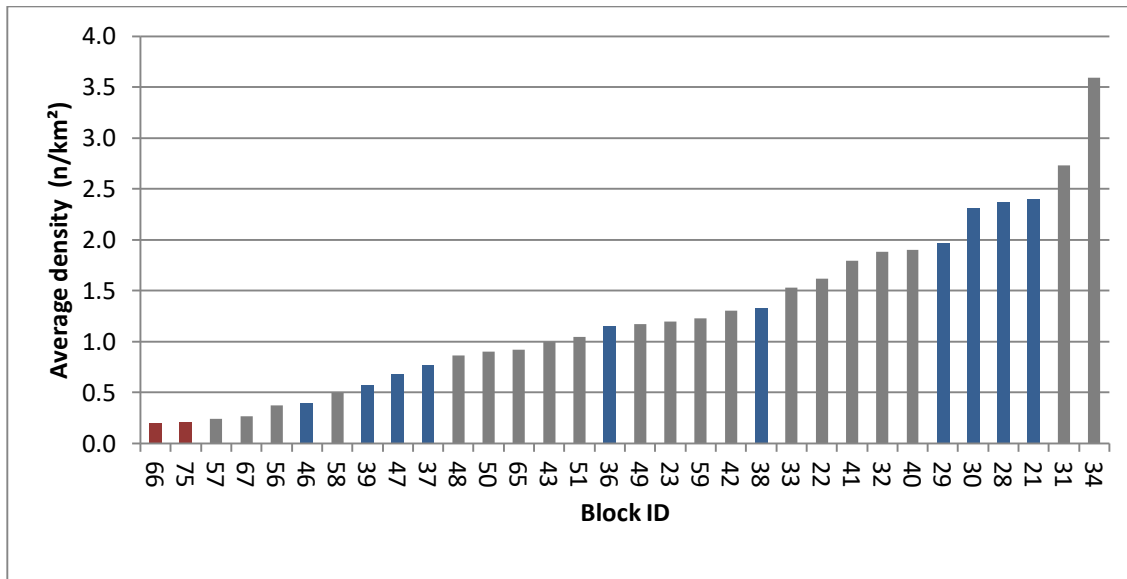


Figure 6. Average density of harbour porpoises *Phocoena phocoena* at the Belgian part of the North Sea (rastered in gridcells of 10 x 10 km); gridcells ranked from low to high average densities. Larger Vlake van de Raan sandbank: red; Vlaamse Banken Site of Community Interest: blue; remainder of Belgian part of the North Sea: grey (after Degraer et al., 2014).

In conclusion, the ecological value of the Vlake van de Raan SCI for harbour porpoises *Phocoena phocoena* is to be considered close to negligible.

TWAIT SHAD *ALOSA FALLAX*

Representativeness, surface area and ecological value

Twait shad is a coastal species that is often encountered at the larger Vlake van de Raan sandbank (Figure 7). The one bream trawl track from within the Vlake van de Raan SCI shows a maximum density of about 1 ind./1000 m². The species is also frequently found north of the larger Vlake van de Raan sandbank (Gootebank and Thornton bank), but is only sporadically detected in the remainder of the Belgian coast. The few data however do not allow to reliably differentiate between areas.

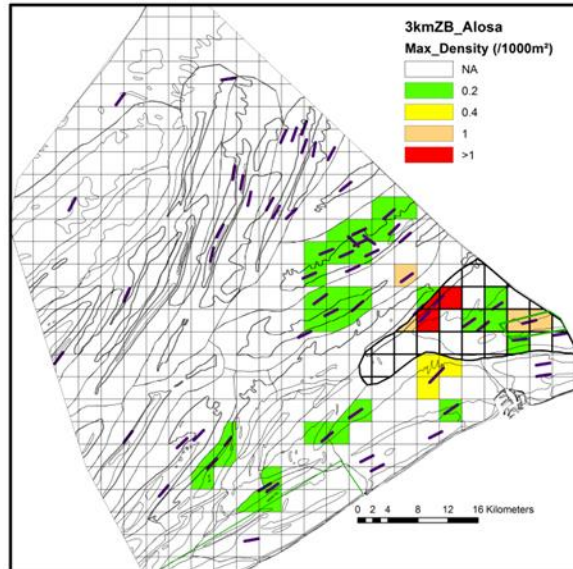


Figure 7. Spatial distribution of twait shad *Alosa fallax* at the larger Vlakte van de Raan sandbank (black polygon) and the Vlakte van de Raan SCI (green polygon) relative to the Belgian part of the North Sea. Purple lines: ILVO-Fisheries beam trawl sampling locations in February-March 2005-2014 (after Degraer et al., 2014).

Conservation value

Although the one sample in the Vlakte van de Raan SCI suggests the area to host a higher conservation value for twait shad, it is clear that conservation measures at the Vlakte van de Raan SCI are unlikely to be effective. The findings of the species at the Vlakte van de Raan SCI should be interpreted as a sign of twait shad migrating towards the Westerscheldt, rather than the SCI to be considered an essential (fish) habitat for twait shad. As such, the conservation value may be considered nil.

In conclusion, while the ecological value of the Vlakte van de Raan for twait shad *Alosa fallax* might be considered high (based on anecdotic data), its conservation value is negligible.

6. CONCLUSION

In conclusion:

1. The Habitat type 1110 at the Vlakte van de Raan SCI needs to be considered a mosaic of areas of poor or medium ecological value interspersed with some elements of high ecological value (only *A. alba* biotope).
2. The ecological value of the Habitat type 1170 at the Vlakte van de Raan SCI scores low, given the low habitat suitability values for *L. conchilega* aggregations.
3. The ecological value of the Vlakte van de Raan SCI for harbour porpoises needs to be considered close to negligible.
4. The conservation value of the Vlakte van de Raan for twait shad *A. fallax* needs to be considered negligible.

Taking account of the above mentioned conclusions and the available knowledge, there is no scientific basis supporting the Vlakte van de Raan SCI to host nature conservation value for any of the habitat types or species for which it was initially proposed within the Habitats Directive. On the contrary, the best available knowledge provides evidence that the Vlakte van de Raan SCI has little to no conservation value. Given the overall low ecological value found for this specific site, there is no significant conservation value that can be protected or improved by any conservation measure.

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