

East Anglia THREE
Offshore Windfarm

East Anglia THREE

Revised Integrity Matrices (HRA7/ HRA8/ HRA9)

Document Reference – Deadline 2/ Revised
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HRA7, HRA8, HRA9

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1 Introduction

1. This document provides updated integrity matrices (Original document reference 5.4(1) Information for the Habitats Regulations Assessment Appendix 1: Screening Matrices) as requested by the Examining Authority in the first written questions (July 6th 2016). The matrices address the following questions: HRA7 and HRA9.
2. To avoid overlapping numbers with the original numbering system for the matrices, where it was necessary to split sites which are both SPAs and Ramsar sites, the original base number has been retained with a prefixed 'a' or 'b' to denote SPA or Ramsar. Hence the original 'Site 005 Alde-Ore Estuary SPA' and Ramsar is now 005a Alde-Ore Estuary SPA and 005b Alde-Ore Estuary Ramsar.

Site 005a												
Name of European Site: Alde-Ore Estuary SPA												
Distance to East Anglia THREE Site 109km												
Site Features	Likely effect(s) of proposed East Anglia THREE project											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding lesser black-backed gulls		Y (a)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (h)	Y (a)	N (h)
Breeding marsh harrier		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (h)	N (h)	N (h)
Breeding avocet		N (d)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (h)	N (h)	N (h)
Breeding little tern		N (e)		N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (h)	N (h)	N (h)
Breeding Sandwich tern		N (f)		N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (h)	N (h)	N (h)
Nonbreeding ruff, avocet, redshank		N (g)		N (g)	N (g)	N (g)	N (g)	N (g)	N (g)	N (h)	N (h)	N (h)

(a) Band model predictions of collision mortality indicate that LSE cannot be ruled out at Scoping so requires further consideration (ES Chapter 13, 13.7.2.4)

(b) Evidence indicates that lesser black-backed gulls are not affected by displacement, disturbance or barrier effects at offshore wind farms (ES Chapter 13, Table 13.15).

(c) Marsh harrier is a migrant species. Satellite tracking suggests that marsh harriers migrate overland to the south coast of England and over the Channel to France, rather than across the North Sea.

(d) Avocet has not been observed in the East Anglia THREE site during bird surveys (Appendix 13.2 Baseline Offshore Ornithology Technical Report). It is highly unlikely that avocets from this SPA will migrate through the East Anglia THREE site, and if they did, their flight height is likely not to be at collision risk height.

(e) Breeding little tern has a maximum foraging range of 11km from colonies, so would have no connectivity with East Anglia THREE. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the East Anglia THREE site.

(f) Breeding Sandwich tern has a maximum foraging range of 54km from colonies, so would have no connectivity with East Anglia THREE. Only very small numbers of terns of any species were observed in the East Anglia THREE site in surveys (Appendix 13.2 Baseline Offshore Ornithology Technical Report). Migrating Sandwich terns from this SPA population will form a very small fraction of that very small number passing the site on passage.

(g) Ruff, avocet and redshank have not been observed during bird surveys at East Anglia THREE (Appendix 13.2 Baseline Offshore Ornithology Technical Report). It is highly unlikely that these birds would migrate through the East Anglia THREE site as their migration is likely to take a coastal route and cross sea at narrow points such as The English Channel. If they did migrate through the East Anglia THREE site their flight height is likely not to be at collision risk height.

(h) The predicted effect attributable to the proposed East Anglia THREE project is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Alde-Ore Estuary SPA.

Site 005b												
Name of European Site: Alde-Ore Estuary Ramsar												
Distance to East Anglia THREE Site 109km												
Site Features	Likely effect(s) of proposed East Anglia THREE project											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding lesser black-backed gulls		Y (a)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (h)	Y (a)	N (h)
Breeding marsh harrier		N (c)		N (c)	N (c)	N (c)	N (c)	N (c)	N (c)	N (h)	N (h)	N (h)
Breeding avocet		N (d)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (h)	N (h)	N (h)
Breeding little tern		N (e)		N (e)	N (e)	N (e)	N (e)	N (e)	N (e)	N (h)	N (h)	N (h)
Breeding Sandwich tern		N (f)		N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (h)	N (h)	N (h)
Nonbreeding ruff, avocet, redshank		N (g)		N (g)	N (g)	N (g)	N (g)	N (g)	N (g)	N (h)	N (h)	N (h)

(a) Band model predictions of collision mortality indicate that LSE cannot be ruled out at Scoping so requires further consideration (ES Chapter 13, 13.7.2.4)

(b) Evidence indicates that lesser black-backed gulls are not affected by displacement, disturbance or barrier effects at offshore wind farms (ES Chapter 13, Table 13.15).

(c) Marsh harrier is a migrant species. Satellite tracking suggests that marsh harriers migrate overland to the south coast of England and over the Channel to France, rather than across the North Sea.

(d) Avocet has not been observed in the East Anglia THREE site during bird surveys (Appendix 13.2 Baseline Offshore Ornithology Technical Report). It is highly unlikely that avocets from this SPA will migrate through the East Anglia THREE site, and if they did, their flight height is likely not to be at collision risk height.

(e) Breeding little tern has a maximum foraging range of 11km from colonies, so would have no connectivity with East Anglia THREE. Migrating little terns are considered to be 'extremely coastal on passage with very few sightings in open ocean or inland' (Forrester et al. 2007), so are unlikely to pass through the East Anglia THREE site.

(f) Breeding Sandwich tern has a maximum foraging range of 54km from colonies, so would have no connectivity with East Anglia THREE. Only very small numbers of terns of any species were observed in the East Anglia THREE site in surveys (Appendix 13.2 Baseline Offshore Ornithology Technical Report). Migrating Sandwich terns from this SPA population will form a very small fraction of that very small number passing the site on passage.

(g) Ruff, avocet and redshank have not been observed during bird surveys at East Anglia THREE (Appendix 13.2 Baseline Offshore Ornithology Technical Report). It is highly unlikely that these birds would migrate through the East Anglia THREE site as their migration is likely to take a coastal route and cross sea at narrow points such as The English Channel. If they did migrate through the East Anglia THREE site their flight height is likely not to be at collision risk height.

(h) The predicted effect attributable to the proposed East Anglia THREE project is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Alde-Ore Estuary Ramsar.

Site 040a												
Name of European Site: Deben Estuary SPA												
Distance to East Anglia THREE Site 124km (a)												
Site Features	Likely effect(s) of proposed East Anglia THREE project											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding dark-bellied brent goose		N (b)		Y (f)	N (c)	N (c)	N (b)	N (b)	N (b)	Y (f)	N (g)	N (g)
Nonbreeding avocet		N (d)		N (e)	N (e)	N (e)	N (d)	N (d)	N (d)	N (g)	N (g)	N (g)
<p>(a) Although the East Anglia THREE site is 124km from Deben Estuary SPA, the onshore cable and associated structures runs through Deben Estuary SPA.</p> <p>(b) Survey data do not show brent geese occurring in the wind farm, so collision risk and barrier effects are considered minimal (Appendix 13.2 Baseline Offshore Ornithology Technical Report).</p> <p>(c) With managed low levels of disturbance during operation and maintenance works, it can be expected that brent goose numbers will continue to remain at a similar level, subject to natural change.</p> <p>(d) Survey data show no evidence of avocets occurring within the East Anglia THREE site, and numbers migrating through the site are likely to be negligible (Appendix 13.2 Baseline Offshore Ornithology Technical Report).</p> <p>(e) Levels of disturbance within the SPA resulting from construction work, maintenance or decommissioning of the onshore cable and associated infrastructure will be negligible for avocet since those birds remain on the intertidal area within the SPA and will be screened from the areas of human activity along the cable route.</p> <p>(f) LSE cannot be ruled out at Scoping as brent geese are sensitive to construction disturbance.</p> <p>(g) The predicted effect attributable to the proposed East Anglia THREE project is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Deben Estuary SPA.</p>												

Site 040b												
Name of European Site: Deben Estuary Ramsar												
Distance to East Anglia THREE Site 124km (a)												
Site Features	Likely effect(s) of proposed East Anglia THREE project											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding dark-bellied brent goose		N (b)		Y (f)	N (c)	N (c)	N (b)	N (b)	N (b)	Y (f)	N (g)	N (g)
Nonbreeding avocet		N (d)		N (e)	N (e)	N (e)	N (d)	N (d)	N (d)	N (g)	N (g)	N (g)
<p>(a) Although the East Anglia THREE site is 124km from Deben Estuary SPA, the onshore cable and associated structures runs through Deben Estuary SPA.</p> <p>(b) Survey data do not show brent geese occurring in the wind farm, so collision risk and barrier effects are considered minimal (Appendix 13.2 Baseline Offshore Ornithology Technical Report).</p> <p>(c) With managed low levels of disturbance during operation and maintenance works, it can be expected that brent goose numbers will continue to remain at a similar level, subject to natural change.</p> <p>(d) Survey data show no evidence of avocets occurring within the East Anglia THREE site, and numbers migrating through the site are likely to be negligible (Appendix 13.2 Baseline Offshore Ornithology Technical Report).</p> <p>(e) Levels of disturbance within the SPA resulting from construction work, maintenance or decommissioning of the onshore cable and associated infrastructure will be negligible for avocet since those birds remain on the intertidal area within the SPA and will be screened from the areas of human activity along the cable route.</p> <p>(f) LSE cannot be ruled out at Scoping as brent geese are sensitive to construction disturbance.</p> <p>(g) The predicted effect attributable to the proposed East Anglia THREE project is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Deben Estuary Ramsar.</p>												

Site 137												
Name of European Site: Outer Thames Estuary SPA												
Distance to East Anglia THREE Site 123km (a)												
Site Features	Likely effect(s) of proposed East Anglia THREE project											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Nonbreeding red-throated divers		N (b)		Y (c)	N (d)	N (d)	N (b)	N (b)	N (b)	Y (c)	N (g)	N (g)
Breeding little tern and common tern (e)		N (f)		N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (g)	N (g)	N (g)
<p>(a) The sub-sea cable from East Anglia THREE site will pass through part of this SPA.</p> <p>(b) Survey data indicate a negligible risk of collision mortality or of a barrier effect (Appendix 13.2 Baseline Offshore Ornithology Technical Report).</p> <p>(c) LSE cannot be ruled out at Scoping for impacts of Displacement/Disturbance to nonbreeding red-throated divers as a result of construction work (specifically of subsea cable laying operations through part of the Outer Thames Estuary SPA).</p> <p>(d) Displacement/Disturbance during operation and decommissioning is considered negligible as the increase in vessel traffic within the SPA due to wind farm will be negligible compared to baseline (ES Chapter 13, 13.7.2.1).</p> <p>(e) Natural England are considering the possibility of adding breeding populations of little tern and common tern as additional features in the Outer Thames Estuary SPA.</p> <p>(f) Little tern and common tern have maximum foraging ranges from colonies of 11km and 30km respectively (Thaxter et al. 2012), so there is no connectivity between the SPA and East Anglia THREE site which 123km apart. Furthermore, these species tend to forage in coastal waters rather than offshore. So collision risk, displacement and barrier effects can be excluded.</p> <p>(g) The predicted effect attributable to the proposed East Anglia THREE project is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Outer Thames Estuary SPA.</p>												

Site 068a												
Name of European Site: Flamborough & Filey Coast pSPA												
Distance to East Anglia THREE Site 257km												
Site Features	Likely effect(s) of proposed East Anglia THREE project											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding kittiwake		Y (a)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (i)	Y (a)	N (i)
Breeding gannet		Y (c)		N (d)	N (d)	N (d)	N (d)	N (d)	N (d)	N (i)	Y (c)	N (i)
Breeding common guillemot		N (e)		N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (i)	N (i)	N (i)
Breeding razorbill		N (e)		N (f)	N (f)	N (f)	N (f)	N (f)	N (f)	N (i)	N (i)	N (i)
Breeding herring gull		N (g)		N (h)	N (h)	N (h)	N (h)	N (h)	N (h)	N (i)	N (i)	N (i)

(a) Band model estimates of collision mortality indicate that LSE cannot be ruled out at the Scoping stage (ES Chapter 13, 13.7.2.4).

(b) Flamborough and Filey Coast pSPA is 257km from East Anglia THREE. Thaxter et al. (2012) report a mean foraging range of breeding kittiwakes as 24.8km, and a maximum recorded distance of 120km. RSPB have recorded one or two even longer distances. However, it is highly exceptional for breeding kittiwakes to travel more than 200km from the colony when foraging. East Anglia THREE therefore represents no barrier or loss of foraging habitat for breeding kittiwakes at Flamborough and Filey Coast pSPA. Migrating birds may avoid the wind farm, so could be affected by a barrier effect or loss of foraging habitat. However, since many kittiwakes from UK colonies migrate to Canadian waters, the scale of any habitat loss or barrier effect is negligible for this species in the context of migrations over tens of thousands of kilometres.

(c) Band model estimates of collision mortality indicate that LSE cannot be ruled out at the Scoping stage (ES Chapter 13, 13.7.2.4)..

(d) Flamborough and Filey Coast pSPA is 257km from East Anglia THREE. Thaxter et al. (2012) report a mean foraging range of breeding gannets as 92.5km, and a maximum recorded distance of 590km. East Anglia THREE is therefore considerably beyond the mean foraging range of breeding gannets, but within their maximum range. Breeding gannets from Flamborough & Filey Coast pSPA may therefore be affected by displacement and barrier effects. However, Searle et al. (2014) found that even with offshore wind farms considerably closer to a gannet breeding colony, impacts of displacement and barrier effects were negligible for this species because of its very long foraging range and large area used for foraging. Similarly, impacts of displacement or barrier effect can be ruled out for migrating gannets since they use a very large range extending from the North Sea to West Africa so that slight local effects would be negligible in the context of their large migrations and area use.

(e) Common guillemots and razorbills tend to fly low over the sea so have a very low risk of collision mortality. Flamborough and Filey Coast pSPA is 257km from East Anglia THREE. Thaxter et al. (2012) report a mean foraging range of breeding common guillemots as 37.8km, and a maximum recorded distance of 135km. Thaxter et al. (2012) report a mean foraging range of breeding razorbills as 23.7km, and a maximum recorded distance of 95km. East Anglia THREE is therefore considerably beyond the normal foraging range of breeding common guillemots and razorbills from Flamborough and Filey Coast pSPA. It is therefore unlikely that

Site 068a

Name of European Site: Flamborough & Filey Coast pSPA

Distance to East Anglia THREE Site 257km

any breeding adults from Flamborough and Filey Coast pSPA are at collision risk at East Anglia THREE during the breeding season. During the nonbreeding season, birds from Flamborough and Filey Coast pSPA are likely to be mixed with the large BDMPS populations of these species so that apportioning of the impact of the low level of collision mortality apportions a negligible impact to Flamborough and Filey Coast pSPA.

- (f) Since East Anglia THREE is beyond the normal foraging range of breeding common guillemots and razorbills from Flamborough and Filey Coast pSPA, there will be no breeding season displacement or barrier impact for those populations. During the nonbreeding period birds from Flamborough and Filey Coast pSPA are likely to be mixed with the large BDMPS populations of these species so that apportioning of the impact of the low level of displacement to this very large BDMPS population apportions a negligible impact to Flamborough and Filey Coast pSPA.
- (g) Flamborough and Filey Coast pSPA is 257km from East Anglia THREE. Thaxter et al. (2012) report a mean foraging range of breeding herring gulls as 10.5km, and a maximum recorded distance of 92km. Therefore, breeding herring gulls from Flamborough and Filey Coast pSPA will not be at risk of collision at East Anglia THREE during the breeding season. Apportioning of collision mortality to this SPA from the levels estimated during the nonbreeding season results in a negligible impact on the Flamborough and Filey Coast pSPA herring gull population.
- (h) The evidence indicates that herring gulls are not affected by displacement or barrier effects at offshore wind farms (ES Chapter 13, Table 13.15).
- (i) The predicted effect attributable to the proposed East Anglia THREE project is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Flamborough and Filey Coast pSPA

Site 068b												
Name of European Site: Flamborough Head and Bempton Cliffs SPA												
Distance to East Anglia THREE Site 257km												
Site Features	Likely effect(s) of proposed East Anglia THREE project											
	Collision mortality			Displacement/Disturbance			Barrier Effect			Cumulative/In-combination		
	C	O	D	C	O	D	C	O	D	C	O	D
Breeding kittiwake		Y (a)		N (b)	N (b)	N (b)	N (b)	N (b)	N (b)	N (c)	Y (a)	N (c)
<p>(a) Band model estimates of collision mortality indicate that LSE cannot be ruled out at the Scoping stage (ES Chapter 13, 13.7.2.4).</p> <p>(b) Flamborough Head and Bempton Cliffs SPA is 257km from East Anglia THREE. Thaxter et al. (2012) report a mean foraging range of breeding kittiwakes as 24.8km, and a maximum recorded distance of 120km. RSPB have recorded one or two even longer distances. However, it is highly exceptional for breeding kittiwakes to travel more than 200km from the colony when foraging. East Anglia THREE therefore represents no barrier or loss of foraging habitat for breeding kittiwakes at Flamborough Head and Bempton Cliffs SPA. Migrating birds may avoid the wind farm, so could be affected by a barrier effect or loss of foraging habitat. However, since many kittiwakes from UK colonies migrate to Canadian waters, the scale of any habitat loss or barrier effect is negligible for this species in the context of migrations over tens of thousands of kilometres.</p> <p>(c) The predicted effect attributable to the proposed East Anglia THREE project is so small that it would not significantly contribute to or alter the overall in-combination assessment for these features at Flamborough Head and Bempton Cliffs SPA</p>												

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