

Kommentering af udkast til produkt af forskningsbaseret faglig rådgivning fra DCE, Aarhus Universitet

<i>Titel på produkt</i>	Teknisk baggrundsrapport for Havpattedyr		
<i>Ansvarlig for produktet (projektleder i DCE)</i>	Line A Kyhn		
<i>Rekvirent</i>	Energinet Eltransmission A/S		
<i>Kontaktperson hos rekvirent</i>	John Adams		
<i>Deadline for fremsendelse af kommentarer</i>	19/6-2024	<i>Dato for afslutning af håndtering af kommentarer</i>	21/6-2024

Rekvirent			DCE		
	Kommentar	Placering i produktet	Ansvarlig for kommentar	Håndtering af kommentar	Ansvarlig for håndtering af kommentar
	<p>Note to author from reviewer: This is the first time our review team reads this report with all data included. It is obvious that you have reported on a huge data set. Please bear in mind that our comments are our best attempts to objectively help improving the final delivery, while at the same time minimizing workload. Please reach out for clarification if any of our comments are unclear, so ensure a quick review process. Thank you.</p> <p>09-07-2024: OK</p>			<p>Thank you for all the good and constructive comments 😊 However due to the very close deadline it is unfortunately not possible to accommodate all them, e.g. on restructuring in chapters. I am sorry for that. But wherever possible I have tried to follow advice on structure.</p>	LKY/LIAK
1	<p>Energy Island North SEA-> Please change to North Sea Energy Island, so the heading aligns with the other technical reports from NIRAS and DEAs scoping report (https://ens.dk/sites/ens.dk/files/Vindenergi/en_energiefor-113_v2_afgraensningsudtalelse_for_plan_for_program_energie_nordsoeen.pdf). Please change throughout the report (this is not commented on again).</p> <p>Please consider changing "[Marine Mammals]" to "Marine Mammals"</p> <p>09-07-2024: You can find it on the front page, see screenshot below:</p> <div style="text-align: center;">  <p>[Marine Mammals]</p> <p>Energinet Eltransmission A/S Date: 07. July 2024</p> </div>	Front page	KTO 17-06-2024	<p>OK, changed throughout the report. Can't find [Marine Mammals]</p> <p>10-07-2024: Found and brackets removed</p>	LKY/LIAK
2	-	-	-		LKY/LIAK



<p>3</p>	<p>1) This description could benefit from being more concise/precise as to the aim of the report and leaving out some of the details about the surveys.</p> <p>Consider using the suggestion below in 1.1: “This technical report presents baseline information on marine mammals obtained from existing knowledge and survey data for the pre-investigation area of North Sea Energy Island (ref to figure). The baseline information is intended to inform future offshore wind farm developers during their environmental impact assessment process.</p> <p>Based on existing knowledge as well as survey data from aerial surveys, passive acoustic monitoring surveys and tagging surveys, this report aims to describe the conservation status, abundance and distribution, seasonal utilization [anything else?] of the relevant species of marine mammals potentially using in the area: harbour seal, grey seal, harbour porpoise, white-beaked dolphins, minke whales, and killer whales.”</p> <p>09-07-2024: OK</p> <p>2) Please don't use the word 'monitoring program' in the report when describing survey activities. A monitoring programme is designed to provide ongoing data tracking changes over time. That is not the case here. Please use the word 'survey' instead.</p> <p>09-07-2024: OK We found a few places, that replacement has not been conducted, please change them too, thank you.</p> <p>1) Page 4:</p> <table border="1"> <thead> <tr> <th>Rev. no.</th> <th>Date</th> <th>Description</th> <th>Done by</th> <th>Verified by</th> <th>Approved by</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>01.07.2024</td> <td>Results of the two year monitoring program for marine mammals in connection with the construction of the North Sea Energy Island.</td> <td>Line Kuhn (DCE) Anders Galatius (DCE) (DCE) Signe Sveegaard (DCE) Emily T. Corfield (DCE) Florence Berthod (DCE) Cristina Mancolin (DCE) Rune Thiel (DCE) Jonas Tøllmann (DCE) Jacob Høber-Hestten (DCE) Ulrika Sabbert (PhD) Domènec Nachreiner (THC)</td> <td>Morten Tange Olsen Jesper Fredholm (DCE) Annette Lützen-Møller (H)</td> <td></td> </tr> </tbody> </table> <p>Project ID: 1047200 Document ID: 102001020001-431146203-14153 Prepared by DCE/Verified by (Enter initials)/Approved by (Enter initials)</p>	Rev. no.	Date	Description	Done by	Verified by	Approved by	4	01.07.2024	Results of the two year monitoring program for marine mammals in connection with the construction of the North Sea Energy Island.	Line Kuhn (DCE) Anders Galatius (DCE) (DCE) Signe Sveegaard (DCE) Emily T. Corfield (DCE) Florence Berthod (DCE) Cristina Mancolin (DCE) Rune Thiel (DCE) Jonas Tøllmann (DCE) Jacob Høber-Hestten (DCE) Ulrika Sabbert (PhD) Domènec Nachreiner (THC)	Morten Tange Olsen Jesper Fredholm (DCE) Annette Lützen-Møller (H)		<p>1.1, p 10</p>	<p>KTO 17-06-2024</p>	<p>Ok, have used your suggestion, but only the first part, as the second part promises too much for species other than harbour porpoises and WBDs.</p> <p>Text now read: “This technical report presents baseline information on marine mammals obtained from existing knowledge and survey data for the pre-investigation area of North Sea Energy Island (Figure 1. 1). The baseline information is intended to inform future offshore wind farm developers during their environmental impact assessment process. Based on existing knowledge as well as survey data from aerial surveys, passive acoustic monitoring and tagging surveys, this report aims to describe the conservation status, temporal presence of harbour porpoises and dolphins from passive acoustic monitoring; abundance and density of harbour porpoises and other cetaceans from aerial surveys in the ex-tended survey area; data on number of hauled out seals throughout the year at the nearest haul-outs over one year are provided. Furthermore, data from the tagging program with movement data from grey- and harbour seals are presented.”</p> <p>2) Have replaced monitoring program with survey program throughout the report. Is not commented again.</p> <p>10-07-2024: All found and changed</p>	<p>LKY/LIAK</p>
Rev. no.	Date	Description	Done by	Verified by	Approved by												
4	01.07.2024	Results of the two year monitoring program for marine mammals in connection with the construction of the North Sea Energy Island.	Line Kuhn (DCE) Anders Galatius (DCE) (DCE) Signe Sveegaard (DCE) Emily T. Corfield (DCE) Florence Berthod (DCE) Cristina Mancolin (DCE) Rune Thiel (DCE) Jonas Tøllmann (DCE) Jacob Høber-Hestten (DCE) Ulrika Sabbert (PhD) Domènec Nachreiner (THC)	Morten Tange Olsen Jesper Fredholm (DCE) Annette Lützen-Møller (H)													



	<p>2) Page 39:</p> <p>3.2.3.3 <i>Broadband analysis – other cetaceans</i></p> <p>Audio dataloggers used in this survey are SoundTraps ST600s from Ocean Instruments, except deployment 8 at 8 for which a SoundTrap ST500 was deployed. The ST600 has an integrated hydrophone, with a frequency response 20 Hz – 150 kHz and a sensitivity range between 174.4–176.7 dB re: 1 µPa/V. The ST500 has a detachable hydrophone. At deployment 8, station NSE08, we used an HTI-96 min hydrophone which has a frequency response of 20 Hz and a maximum sensitivity of 165 dB re: 1V/µPa (562 V/bar).</p> <p>In order to capture the full bandwidth of marine mammal vocalizations, including delphinid echolocation click marine mammal stations were programmed to record at 384 kHz on a 10–12 minutes 'on' per 15 minutes duty cycle allow recording for three months at a time. It is not possible to record continuously for three months at a time battery and memory limitations, which was the service interval in the <u>monitoring</u> program.</p> <p>3) Page 40:</p> <p>3.2.3.3.2 <i>Minke whale analysis</i></p> <p>The North Sea is a known habitat for minke whales (<i>Balaenoptera acutorostrata</i>), and there exists published methods to detect and classify minke whale pulse trains from autonomous recordings (Risch et al., 2013; Risch et al., 2014; Risch et al., 2019). These methods have been used to help monitor minke whale migration and seasonal use of western North Atlantic waters and have been successfully applied to the Moray Firth along the east coast of Scotland, which is adjacent to the pre-investigation area in the North Sea. The original acoustic survey design for minke whales in the <u>monitoring</u> program was to employ the methods developed by Risch et al. in Danish waters, which targets the minke whale train (Risch et al., 2019). The vocal repertoire of minke whales is not well described, especially not in terms of context specific behaviour. It is for example not known when and why minke whales produce sounds, so it is not for certain that minke whales produce sound in the pre-investigation area. It has not previously been studied in this part of the North Sea. Absence of sounds should however not be taken as evidence of absence of the species in the pre-investigation area.</p> <p>4) Page 69 (change to marine mammals survey?):</p> <p>Table 4. 8. Data and results from the three aerial surveys conducted during the North Sea Energy Island <u>monitoring</u> in 2022 and in the extended survey area. CV = Coefficient of Variation.</p> <table border="1" data-bbox="360 738 790 890"> <thead> <tr> <th>Survey date</th> <th>Completed effort (km)</th> <th>Abundance (95% Confidence Interval)</th> <th>Density (95% Confidence Interval)</th> <th>Mean group size</th> <th># of harbour porpoises observed (incl. calves)</th> <th># of calves observed</th> <th>Call ratio</th> <th>CV</th> </tr> </thead> <tbody> <tr> <td>27-04-2022</td> <td>504</td> <td>2642 (1362–4431)</td> <td>0.74 (0.38–1.24)</td> <td>1.12</td> <td>46</td> <td>0</td> <td>0%</td> <td>0.30</td> </tr> <tr> <td>29-07-2022</td> <td>506</td> <td>7011 (3728–11327)</td> <td>1.96 (1.04–3.16)</td> <td>1.44</td> <td>138</td> <td>22</td> <td>16%</td> <td>0.27</td> </tr> <tr> <td>31-07-2023</td> <td>503</td> <td>3154 (1845–5177)</td> <td>0.88 (0.52–1.45)</td> <td>1.33</td> <td>77</td> <td>12</td> <td>16%</td> <td>0.26</td> </tr> </tbody> </table>	Survey date	Completed effort (km)	Abundance (95% Confidence Interval)	Density (95% Confidence Interval)	Mean group size	# of harbour porpoises observed (incl. calves)	# of calves observed	Call ratio	CV	27-04-2022	504	2642 (1362–4431)	0.74 (0.38–1.24)	1.12	46	0	0%	0.30	29-07-2022	506	7011 (3728–11327)	1.96 (1.04–3.16)	1.44	138	22	16%	0.27	31-07-2023	503	3154 (1845–5177)	0.88 (0.52–1.45)	1.33	77	12	16%	0.26				
Survey date	Completed effort (km)	Abundance (95% Confidence Interval)	Density (95% Confidence Interval)	Mean group size	# of harbour porpoises observed (incl. calves)	# of calves observed	Call ratio	CV																																	
27-04-2022	504	2642 (1362–4431)	0.74 (0.38–1.24)	1.12	46	0	0%	0.30																																	
29-07-2022	506	7011 (3728–11327)	1.96 (1.04–3.16)	1.44	138	22	16%	0.27																																	
31-07-2023	503	3154 (1845–5177)	0.88 (0.52–1.45)	1.33	77	12	16%	0.26																																	
4	<p>1) Please check deliveries for consistent and correct use of non-capital letters for 'phase 1 area'. This has been implemented in the tagging and Fish and Fish populations reports.</p> <p>09-07-2024: OK</p> <p>2) Please change figure text, so it corresponds to the tagging report. I.e.: "Pre-investigation area, extended survey area and the phase 1 area of the proposed plan for the program North Sea Island."</p> <p>09-07-2024: OK</p>	1.2, p 10-11	KTO 18-06-2024	<p>1) Done</p> <p>2) I am not sure what is wrong. I have changed the order of the mentioned areas in the figure text.</p>	LKY/LIAK																																				



5	<p>1) Please change heading to '2. Existing data', so it corresponds with the heading used in report on Fish and fish populations.</p> <p>09-07-2024: OK</p> <p>2) Please focus introduction text in chapter 2, so it provides a better guiding of the reader.</p> <p>See report on Fish and fish populations, or the following suggestion: "This chapter provides an overview on the conservation status, biology and seasonal presence [correct?] of the marine mammal species potentially occurring in the pre-investigation area of North Sea Energy Island, namely harbour seal (<i>Phoca vitulina</i>), grey seal (<i>Halichoerus grypus</i>), harbour porpoise (<i>Phocoena phocoena</i>), white-beaked dolphin (<i>Lagenorhynchus albirostris</i>), minke whale (<i>Balaenoptera acutorostrata</i>), and killer whale (<i>Orcinus orca</i>). The information is based on existing knowledge from available literature such as peer-reviewed journals as well as non-peer-reviewed reports."</p> <p>09-07-2024: OK</p> <p>3) Please ensure that phase 1 area, extended survey area and pre-investigation area are all displayed in the relevant figures.</p> <p>09-07-2024: OK. Regarding showing the extended survey area ect you are right that there has been conflicting requests from our side. However, we have following agreed to re-introduce it in figures again during correspondence with you project manager Annette Møller, and also during the review process of Fish and Fish Populations, Tagging, and Birds. But we accept that it is left out in this report specifically, out of consideration to the delivery deadline. Therefore, no action is needed.</p>	2, p 12	KTO 18-06-2024	<p>1) Ok, changed to "Existing data"</p> <p>2) OK, included.</p> <p>3) We have in the former review round been asked <u>not to</u> use the phase 1 area in maps, and have therefore removed it from all figures. Except where really necessary. It is not possible to replace the figures until end of July 2024, as the GIS person making the figures (and holding the relevant data) at AU is on vacation.</p> <p>10-07-2024: I am sorry. I have then misunderstood that information. We could update the report following the Summer break, if you wish so.</p>	LKY/LIAK
---	---	---------	----------------	---	----------



6	<p>Overall, the updated text in the tagging report is focused towards the scope of the report than the text in the marine mammals report. Please consider, if the text should be substituted 1:1, including headings. If not, please check very similar sections if they should be 1:1 substituted.</p> <p>09-07-2024: OK, no action needed. I was a comment meaning that the chapter 3 Baseline description/3.1 Seals in the tagging report is very good, and could replace the chapter 2.1 Seals in the marine mammals report. But no action required.</p>	2.1, p 12-18	KTO 18-06-2024	<p>I am not entirely sure I understand what is meant here? The agreement was to include the tagging report 1:1 so this report can be read and understood without the tagging report. The included chapters are checked for consistency with the wording of this report.</p>	LKY/LIAK
7	<p>Please change heading to '3. Methods and surveys', so it aligns with the report on Fish and fish populations</p> <p>09-07-2024: OK</p>	3, p 27	KTO 18-06-2024	Changed	LKY/LIAK



8	<p>You describe your methodology very well in this chapter. However, choosing to structure the chapter according to your survey activities (aerial, PAM, tagging) makes it complicated to 'zoom out' on and explain overall methodology considerations. It would highly benefit readers understanding, if you start the chapter by providing an overview of your overall setup and methodological considerations:</p> <ol style="list-style-type: none"> 1) Overall objective, and required data 2) Survey design (choice of area, timing, sampling stations etc. - is the setup robust?) 3) Data collection methods (aerial survey method ect. is well described!) 4) Data analysis (lab work, calculations, statistical analysis) – Put this in the subchapters 5) Finally, results should be compared to existing data to see, if they correspond 😊 <p>Below is some text suggestion regarding objective and survey design, for your inspiration, to minimize workload. Feel free to use it as inspiration:</p> <p>"The objective of the marine mammals survey program was to collect site specific data to study, if the pre-investigation area is used by marine mammals as [feeding and nursing ground?].</p> <p>To study this, aerial surveys, passive acoustic monitoring (PAM) surveys, and tagging surveys were chosen as survey methods to collect information about abundance, densities, distributions and migration [correct? Anything else?] pattens of the marine mammals potentially using in the area: harbour seal, grey seal harbour porpoise, white-beaked dolphins, minke whales, and killer whales [ref to overview table, if you chose to insert].</p> <table border="1" data-bbox="309 1220 831 1423"> <thead> <tr> <th>Data/Method</th> <th>Aerial survey</th> <th>PAM survey</th> <th>Tagging survey</th> </tr> </thead> <tbody> <tr> <td>Survey period</td> <td>09/2021-09/2023</td> <td>?</td> <td>?</td> </tr> <tr> <td>Target species</td> <td>Harbour seal, grey seal, harbour porpoise</td> <td>Harbour porpoise</td> <td>All: Harbour seal, grey seal harbour porpoise, white-beaked dolphins, minke whales, and killer whales</td> </tr> <tr> <td>Species</td> <td>x</td> <td>x</td> <td>x</td> </tr> <tr> <td>Abundance</td> <td>x</td> <td>x</td> <td></td> </tr> <tr> <td>Density</td> <td>x</td> <td>x</td> <td></td> </tr> <tr> <td>Distribution</td> <td>x</td> <td>x</td> <td></td> </tr> <tr> <td>Migration pattern</td> <td></td> <td></td> <td>x</td> </tr> </tbody> </table>	Data/Method	Aerial survey	PAM survey	Tagging survey	Survey period	09/2021-09/2023	?	?	Target species	Harbour seal, grey seal, harbour porpoise	Harbour porpoise	All: Harbour seal, grey seal harbour porpoise, white-beaked dolphins, minke whales, and killer whales	Species	x	x	x	Abundance	x	x		Density	x	x		Distribution	x	x		Migration pattern			x	3, p 27-43	KTO 18-06-2024	<p>This is quite extensive extra work that there isn't time to do at this stage. The table is a good idea and will be inserted as table 3.1.</p> <p>The below changes have been made:</p> <p>1) The text is now as follows: "The objectives of the marine mammal survey program was to collect site specific data to study the use of the extend-ed survey area by marine mammals. Several different types of data are needed to get an in depth understanding of the use of an area by different species. Abundance and density of a species provides data on number of animals using the area along with some information on distribution, and can be obtained by aerial surveys (Hammond, Lacey et al. 2017). However, such data represents snapshots in time and does not provide yearly, seasonal or diurnal patterns of use, as surveys are flown on single days, under daylight conditions and only in very good weather. Therefore passive acoustic monitoring (PAM) is used to detect cetaceans 24/7/365. PAM data provides in-depth information on presence/absence at the level of microseconds, relative density, diurnality and seasonality and the data is excellent in statistical analyses as n is usually very high (Carlén, Thomas et al. 2018). PAM can to some degree be used to differentiate between species. Neither PAM nor aerial surveys provide data on migration pattern and only to some degree on be-haviour, therefore tagging was used to obtain movement data informing on the use of the area relative to other areas, as well as behaviour such as foraging and migration (Heide-Jørgensen, Dietz et al. 2002). Seals can not be separated to species from the air and was instead counted on their haul-outs to obtain abundance data (Hansen and Høgslund 2021). The seal counts provides data on number of animals potentially using the area, and the counts were also used to inform the habitat suitability model performed on the tagging data.</p> <p>Overall, in this environmental survey program for marine mammals (harbour seal, grey seal harbour porpoise, white-beaked dolphin, minke whale and killer whale) aerial surveys (cetaceans and seal surveys) was used to obtain species, distribution, abundance and density data as well as presence of cetacean calves, passive acoustic monitoring was used to</p>	LKY/LIAK
Data/Method	Aerial survey	PAM survey	Tagging survey																																		
Survey period	09/2021-09/2023	?	?																																		
Target species	Harbour seal, grey seal, harbour porpoise	Harbour porpoise	All: Harbour seal, grey seal harbour porpoise, white-beaked dolphins, minke whales, and killer whales																																		
Species	x	x	x																																		
Abundance	x	x																																			
Density	x	x																																			
Distribution	x	x																																			
Migration pattern			x																																		



	<p>Table x: Survey methods and data output</p> <p>Surveys were planned over the course of two years to cover the temporal variation, since some marine mammal species have migratory traits.</p> <p>For the individual surveys, geographical scope, timing, data collection and data analysis is presented in the following subchapters”.</p> <p>09-07-2024: Ok, very fine description added, thank you.</p> <p>Is the added text ‘24/7/365’ a typing error? If yes, please delete it. If not, consider explaining the meaning to the reader.</p>			<p>obtain patterns in presence 24/7/365 and species, and tagging surveys were chosen as methods to collect information migration patterns and use of the area for foraging. See Table 3. 1 for an overview of methods and the data these methods provide.</p> <p>All methods were recommended by DCE and NIRAS and was approved by Energinet in the scoping report before fieldwork commenced. Surveys lasted two years to try to get some impression of the temporal variation and to aid overall data redundancy as one month of data was required per season. However, to obtain a good impression of yearly variation, several years of data collection is needed. For the individual surveys, geographical scope, timing, data collection and data analysis is presented in the following subchapters.”</p> <p>2), 3), 4): Geographical scope, survey design, data collection method and analysis methods are covered under each species group and method.</p> <p>4) Comparison with previous studies is covered in 4. Results and 5. conclusion chapters.</p> <p>10-07-2024: 24/7/2024 has been replaced with ‘throughout the day and year’</p>	
9	<p>The introduction text is somewhat confusing to the reader, since we are in the method chapter, and the text is not about method.</p> <p>Consider deleting the text, as it is adding complexity instead of providing clarity.</p> <p>09-07-2024: Ok</p>	3.1, p 27	KTO 18-06-2024	Introductory text is retained but is framed as geographical scope as suggested by the reviewer.	LKY/LIAK



10	<p>1) Consider starting the subchapter with a sentence such as 'To determine abundances, densities, and distribution of seals in the pre-investigation area, aerial surveys with manual observation were conducted.' In this way, the reader is introduced to both the research survey objective and the survey method before the detailed method description.</p> <p>2) It would be beneficial with a map showing the aerial survey transect area (=survey coverage area) – since the exact survey area is difficult to read from the current text. Is it correct understood, that no aerial survey was conducted in the pre-investigation area? If yes, please specify this in the text and argue, why the survey setup is still considered robust enough to answer to the report objective of describing marine mammals use of the pre-investigation area.</p> <p>3) Please specify in the method, why the on-shore haul-sites are considered relevant to study, for describing seals use of the off-shore pre-investigation area – it is not self-explicatory. How do you use the collected data (number of seals on the coast of Denmark) in your conclusions? How do you extrapolate observations? What are the strength and uncertainty in the applied method?</p> <p>4) To increase transparency for the reader, please provide a table overview of your survey dates and locations for the aerial surveys, to the extent possible. See https://ens.dk/sites/ens.dk/files/Vindenergi/3208_enoe_wsp_wpf_marine_mammals.pdf table 3-1/3-2 for inspiration.</p> <p>5) Please don't use the word 'monitoring program' in the report when describing survey activities. A monitoring programme is designed to provide ongoing data tracking changes over time. That is not the case here. Please use the word 'survey' instead.</p> <p>6) Please add the phase 1 area to Figure 3-1.</p>	3.1.1, p 27-29	KTO 18-06-2024	<p>1) This is not quite what was done. Seals were only counted on their haul-outs and therefore only provides data on abundance of species in their haul-outs. The chapter is rewritten to explain this:</p> <p>“There are two relevant seal species in the pre-investigation area for the North Sea Energy Island. The two species are similar in size, shape and colour when viewed from the air, and only very large grey seals can with certainty be identified to species from the air. Therefore seals are counted on the nearest haul-outs to the pre-investigation area. To obtain knowledge about seals' use of the pre-investigation area, seals were tagged with satellite transmitters (please see chapter 3.3). The geographical scope of the seal counts were therefore the nearest haul-outs to the North Sea Energy Island pre-investigation area. The pre-investigation area is located approximately 75 km west of the important seal haul-outs in Nissum Bredning in the western Limfjord and 100 km northwest of the important seal haul-out areas in the Danish Wadden Sea. The Wadden Sea is also an important breeding area for harbour seals and the only place where grey seals breed in the Danish part of the North Sea. Therefore haul-outs in both the Wadden Sea and Nissum Bredning at Thyborøn were chosen as the geographical scope for seal counts.”</p> <p>2) There is no survey area with transects. Seals are only counted on their haul-outs as species can not be verified from the air. They are counted occasionally in the cetacean aerial survey program and during bird surveys. This is part of the reason why the tagging program was introduced. This is now explained in the beginning of the chapter in the general introduction to the methods – please see below, and as written above. The introduction is changed to the following text:</p> <p>“Aerial surveys of seals are conducted to collect data on the numbers of seals hauled out at Danish localities relevant to the pre-investigation area for the North Sea Energy Island; sandbanks in the Wadden Sea and in Nissum Bredning, the western part of the Limfjord (Please see Figure 3. 1 for position of the haul-outs). The seals counted on these haul-outs represents the seal populations most likely to use the</p>	
----	---	----------------	----------------	--	--



	09-07-2024: Ok, very helpful thank you			<p>pre-investigation area. The data are used along with the tagging data to inform a habitat suitability model to evaluate the potential value of the pre-investigation area for the two seal species (please see chapter 3.3.6.6). Seals are observed sporadically during aerial surveys for cetaceans and for birds, and position is logged for every sighting (please see chapter 3.2). However, due to the small number of observations, density and abundance estimates cannot be calculated. To provide density estimates of a species a critical amount of sightings is needed (where sightings can actually be verified to species), otherwise the density estimate becomes very unprecise. The registered number of seals during the aerial survey in the North Sea Energy Island are, is way too few to calculate at density estimate. The habitat suitability models provide a stronger estimate on the areas' importance for the two seal species.</p> <p>3) This is explained above.</p> <p>4) This is included in the result chapter.</p> <p>5) This comment has been answered above.</p> <p>6) We have specifically been asked to remove the phase 1 area from all figures where it is not relevant. See above reply regarding "phase 1"</p>	
--	---	--	--	---	--



11	<p>Please add a description of data analysis:</p> <ul style="list-style-type: none">- How did you assure data consistency and quality (already well described)- Did you do any calculations from the raw data of e.g. density (individuals/km²) within the pre-investigation area? Describe how you go from number of counted seals onshore in Denmark to expected number of seals within the pre-investigation area. <p>09-07-2024: Ok</p>	3.1.2, p 29	KTO 18-06-2024	<p>1) This is already explained: "To minimize variation in the data, surveys were conducted under a range of predefined conditions: no precipitation during the survey and the preceding 6 hours, observations conducted between 11 am and 18 pm, winds below 10 ms⁻¹. Notes on observations outside the photographs, time points at key localities and any deviations from the planned procedure are taken by the leader of the survey. Photos can be used to verify species with certainty." And "For each survey, seals were counted from the two series of photographs by two independent observers. If the discrepancy between the two counts exceeded 5%, a third, independent count was conducted."</p> <p>2) We did not calculate a number of expected seals in the pre-investigation area. Number of seals hauled out in 2022 was included in the habitat suitability model based also on tagging data. To provide density estimates of a species a critical amount of sightings is needed (where sightings can actually be verified to species), otherwise the density estimate becomes very unprecise. The registered number of seals during the aerial survey in the North Sea Energy Island area, is way too few to calculate a density estimate. The habitat suitability models provide a stronger estimate on the areas' importance for the two seal species.</p>	LKY/LIAK
----	--	-------------	----------------	---	----------



12	<p>1) Please remove references to construction of offshore windfarms throughout the text – the scope of the report is to describe marine mammals use of the pre-investigation area.</p> <p>2) The introduction text is somewhat confusing to the reader, since we are in the method chapter, and the text is not about method. Please delete the text, as it is adding complexity instead of providing clarity. Or incorporate it in chapter 2.</p> <p>3) It is somewhat hard for the reader to keep an overview of your aerial survey activities in chapter 3.2.1 and 3.2.2. It would help, if you put 3.2.1 and 3.2.2 in the same subchapter (subchapter '3.2.1 Aerial surveys – cetaceans') and simplified your text a little, because they share much of the same methodology (it is just the geographical scope that is changed, equipment, data logging, data analysis ect is the same). Then, you will also be able to provide an initial coherent overview of the aerial survey activities:</p> <table border="1" data-bbox="309 791 831 922"> <thead> <tr> <th>Survey no.</th> <th>Date</th> <th>Area</th> <th>Flight distance (km)</th> <th>Survey effort (km2)</th> <th>Covered area (%)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>xx-xx-2022</td> <td>Extended pre-investigation area (Figure 3.2)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>xx-xx-2022</td> <td>Extended pre-investigation area (Figure 3.2)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>xx-xx-2022</td> <td>North sea (Area 1+2 in figure 3.3)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>xx-xx-2022</td> <td>North sea (Area 3 in figure 3.3)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>xx-xx-2023</td> <td>North sea (Area 4 in figure 3.3)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td>xx-xx-2023</td> <td>North sea (Area 5 in figure 3.3)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>7</td> <td>xx-xx-2023</td> <td>North sea (Area 6 in figure 3.3)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>8</td> <td>xx-xx-2023</td> <td>North sea (Area 7 in figure 3.3)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>?</td> <td>?</td> <td>North sea (Area 8 in figure 3.3)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>?</td> <td>?</td> <td>North sea (Area 9 in figure 3.3)</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>09-07-2024: Ok</p>	Survey no.	Date	Area	Flight distance (km)	Survey effort (km2)	Covered area (%)	1	xx-xx-2022	Extended pre-investigation area (Figure 3.2)				2	xx-xx-2022	Extended pre-investigation area (Figure 3.2)				3	xx-xx-2022	North sea (Area 1+2 in figure 3.3)				4	xx-xx-2022	North sea (Area 3 in figure 3.3)				5	xx-xx-2023	North sea (Area 4 in figure 3.3)				6	xx-xx-2023	North sea (Area 5 in figure 3.3)				7	xx-xx-2023	North sea (Area 6 in figure 3.3)				8	xx-xx-2023	North sea (Area 7 in figure 3.3)				?	?	North sea (Area 8 in figure 3.3)				?	?	North sea (Area 9 in figure 3.3)				3.2, p 29	KTO 18-06-2024	<p>1) ok 2) ok 3) Methods are not described in both two sub chapters. Two sub chapters were chosen, as to cover the entire North Sea was not part of the original scope. However, it has now been changed to be a single chapter called "3.2.1 Aerial surveys for cetaceans"</p> <p>Specific survey dates are results and is shown in the results' chapter.</p>	
Survey no.	Date	Area	Flight distance (km)	Survey effort (km2)	Covered area (%)																																																																		
1	xx-xx-2022	Extended pre-investigation area (Figure 3.2)																																																																					
2	xx-xx-2022	Extended pre-investigation area (Figure 3.2)																																																																					
3	xx-xx-2022	North sea (Area 1+2 in figure 3.3)																																																																					
4	xx-xx-2022	North sea (Area 3 in figure 3.3)																																																																					
5	xx-xx-2023	North sea (Area 4 in figure 3.3)																																																																					
6	xx-xx-2023	North sea (Area 5 in figure 3.3)																																																																					
7	xx-xx-2023	North sea (Area 6 in figure 3.3)																																																																					
8	xx-xx-2023	North sea (Area 7 in figure 3.3)																																																																					
?	?	North sea (Area 8 in figure 3.3)																																																																					
?	?	North sea (Area 9 in figure 3.3)																																																																					



<p>13</p>	<p>1) Try to delete the word 'harbour porpoise' from the chapter and substitute it with 'cetaceans'. Point is, the survey programme is designed to register cetaceans, not just harbour porpoise. The result that only harbour porpoise were observed belongs in the result chapter.</p> <p>2) Consider starting the text with something similar to: 'To determine abundances, densities, and distribution of cetaceans in the pre-investigation area, aerial surveys with manual observation were conducted.'</p> <p>3) The sentence 'A 15 km buffer zone was included around the <i>former windfarm development area</i>' is incorrect. Please refer to the phase 1 area.</p> <p>4) Please delete this text, as it belongs in a EIA for a specific project instead of this baseline report (you have already described why the 15 km zone is used. Also, it takes away focus from you description of the survey area): 'This was defined in the scoping report, at which time the areal definition Phase 1 area of the proposed plan for the program North Sea Energy Island was used. This area and the 15 km buffer is henceforth called 'the extended survey area' (see also chapter 1.2). This range was identified by reviewing current literature on impact ranges from offshore wind farm constructions. The largest expected impact on harbour porpoises is the underwater noise generated during pile driving, where the foundations are hammered into the seabed. Several studies have estimated the impact on harbour porpoises during the construction phase of a wind farm, by comparing the presence of harbour porpoises before, during and after construction work has ended. All studies concluded that when using mitigation in the form of soft start/ramp up and acoustic deterrent devices (to drive harbour porpoises out of the core area – no longer a recommended procedure) and double or single bubble curtains (to lower the emitted noise level), the maximum distance affected for harbour porpoises ranged between 10 and 15 km (Dähne, et al., 2013; Dähne, et al., 2017; Brandt, et al., 2018). Thus, it was chosen to include a 15 km buffer.'</p>	<p>3.2.1, p 29</p>	<p>KTO 18-06-2024</p>	<p>1) We understand what you mean, however, since we knew in advantage that harbour porpoises would be the dominant species, it is a bit misleading to change it to cetaceans. We also knew that it was doubtful to get abundance and density for other species than harbour porpoises. The text is therefore retained not to lead to expectations for other species.</p> <p>2) first sentence changed to: "Aerial surveys were the chosen method to obtain data on species, distribution, abundance, density and presence of calves."</p> <p>3) See answer below.</p> <p>4) We do not agree. This was the reason for having the 15 km buffer around the former project area/phase 1 area, and that needs to be explained. It is shortened to:</p> <p>"The geographical scope was the phase 1 area plus a 15 km buffer zone around it, in order to cover the area where harbour porpoises - the most common cetacean species in the Danish part of the North Sea - may be affected behaviourally during piling of the turbine foundations. The buffer zone was based on harbour porpoise reactions to piling noise and is justified in the scoping report."</p> <p>4b) ok</p> <p>5) We have to a large degree followed your suggestions 1)-4) see above, but not with the wording suggested. Please see revised chapter.</p>	
-----------	--	--------------------	-----------------------	--	--



4) Please move this text from the methodology chapter to the results chapter: "However, there were too few observations to conduct abundance analysis for other species than harbour porpoises. Instead, the observations are presented in separate tables and maps."

5) To summarize comment 1-4 above, below is a suggestion to recomposition of the text in subchapter 3.2.1 and 3.2.2. Please consider if you find it relevant to implement some of the suggestions:

"[Intro – objective, parameters and survey method]
To determine abundances, densities, and distribution of cetaceans in the pre-investigation area, aerial surveys using manual observation were conducted. Targeted cetaceans were harbour porpoise, white-beaked dolphins, minke whales, and killer whales.

[Temporal scope]
Four aerial surveys per year was conducted in 2022 and 2023, focusing on [the reproductive period of marine mammals?] in spring, summer and autumn. A total of [8?] aerial surveys were conducted in the period, as shown in table x.

Survey no.	Date	Area	Flight distance (km)	Survey effort (km ²)	Covered area (%)
1	xx-xx-2022	Extended pre-investigation area (Figure 3.2)			
2	xx-xx-2022	Extended pre-investigation area (Figure 3.2)			
3	xx-xx-2022	North sea (Area 1+2 in figure 3.3)			
4	xx-xx-2022	North sea (Area 3 in figure 3.3)			
5	xx-xx-2023	North sea (Area 4 in figure 3.3)			
6	xx-xx-2023	North sea (Area 5 in figure 3.3)			
7	xx-xx-2023	North sea (Area 6 in figure 3.3)			
8	xx-xx-2023	North sea (Area 7 in figure 3.3)			
?	?	North sea (Area 8 in figure 3.3)			
?	?	North sea (Area 9 in figure 3.3)			

[Geographical scope]
Aerial surveys were conducted in the extended survey area (Figure 3.2), well as in the entire North Sea (Figure 3.3). The latter was a result of opportunity arising from synergies between the North Sea Energy Island pre-investigations and simultaneous projects for the Danish Energy Agency and The Danish Environmental Protection Agency.

The extended survey area was defined as the phase 1 area plus a 15 km buffer zone. The buffer zone was



<p>applied to include an area where harbour porpoise potentially could be affected behaviourally from under water noise during piling of wind turbine foundations. The extended survey area was 3,580 km² (Figure 3. 2) and the aerial survey design consisted of a total of 9 transect lines with a 7 km spacing in between and total length of 505 km. The transect lines ran parallel to each other in a north-south direction and a coverage of approximately [x %] of the total area. A total of [x km²] were covered during each survey. The predesigned transect lines (parallel design and equal spacing) ensured equal coverage probability, which allows extrapolation of the data between the survey lines when using the Distance Sampling methodology (Buckland et al., 2001).</p> <p>For the survey area covering the entire North Sea, data was collected as describe above for the extended survey area. To optimize data collection for the rest of the area, the aerial survey design consisted of a zig-zag transect design (Figure 3.3).</p> <p><i>[Data collection method and equipment]</i> Data collection was performed as manual observations, following the methodology standard described in Scheidat et al. (2008) and Gilles et al. (2009). In brief, three experienced observers were onboard the aircraft (a Partenavia with bubble windows): two at the bubble windows and one data collector in the co-pilot seat. Once a marine mammal was observed, the observer reported the number of individuals, the angle of observation (measured with an inclinometer, where 90 degrees is directly below the plane and 0 degrees is horizontal), observation cue, behaviour, ect.. Environmental data on sea state, cloud cover and glare were also collected and updated as conditions changed. Each observer continuously assessed their own subjective sightability as good, moderate, or poor, indirectly considering factors like wind, waves, sea state, wave foam, silvery shine, and glare. Previous surveys, like SCANS-II and SCANS-III, showed sightability to be the best predictor of harbour porpoise presence. The data recorder noted all information using the VOR or</p>				
---	--	--	--	--



<p>SAMMOA programs on a field laptop. The survey program switched from VOR to SAMMOA in July 2022 to align with the international SCANS-IV survey and for better data validation, with no impact on the results. During line transect distance sampling, the perpendicular distance of a harbour porpoise sighting to the track line is estimated from the observation angle. These distances are used in abundance analyses to estimate the effective strip width covered by the plane.</p> <p>A twin-engine, high-wing propeller-driven aircraft (Partenavia P 68 with bubble windows) was used for data collection. The aircraft flew at an average speed of 185.2 km/h (100 knots) at an altitude of 183 m. A GPS device recorded the position every second, which permitted to geographically assign a location to the observations.</p> <p><i>[Data analysis]</i> Your subchapter 3.2.3"</p> <p>09-07-2024: Ok, thank you</p>				
--	--	--	--	--



14	<p>1) Sorry, but I have read this a couple of times without understanding how many surveys were conducted and when. It would be very helpful, if you could provide a table overview summing the entire aerial survey programme, as suggested in comment #12.</p> <p>2) Please don't use the word 'monitoring program' in the report when describing survey activities. A monitoring programme is designed to provide ongoing data tracking changes over time. That is not the case here. Please use the word 'survey' instead.</p> <p>3) Please remove 'results' from the methodology chapter if possible. E.g.: 'In 2022, only two surveys were conducted in the extended survey area due to poor survey weather. However, these surveys showed an unprecedented high density of harbour porpoises in the extended survey area.'</p> <p>4) Please add phase 1 area and pre-investigation area to figure. Legend: consider changing 'planned aerial transects' to 'aerial transects' since the work has been conducted. Please do not use the word 'monitoring program' when referring to the survey in the figure text.</p> <p>5) Text states: 'Therefore, the remaining surveys (two from 2022 and four from 2023) were pooled into a summer survey'. Pooling usually mean pooling data from already conducted works, but that is not the case, is it? Do you mean 'substituted' instead of 'pooled'? Overall, does it mean that a total of only 3 aerial surveys of the planned 8 were conducted in the extended survey area from 2022-2023? Please justify in the text, why this setup is still considered robust in relation to the report objective (providing information on marine mammals use of the pre-investigation area).</p> <p>09-07-2024: Ok</p>	3.2.2, p 31	KTO 18-06-2024	<p>1) I have inserted a table with the intended aerial surveys.</p> <p>2) Ok.</p> <p>3) I agree it is weird in the methods section. However, this was not planned in the scope, and was only possible due to bad weather in 2022 and third parties carrying out aerial surveys in 2023. I would therefore like to keep it in. I have however changed the sentence to: "Therefore, the budget for the remaining surveys (two from 2022 and four from 2023) were pooled into a summer survey covering all of the Danish North Sea and Skagerrak."</p> <p>4) It is not possible – see answer above.</p> <p>5) We mean in Danish "pooled =slået sammen", as can be done with data. It is correct that due to weather, only two aerial surveys could be carried out in 2022. Based on the high density of animals (including calves), it was agreed with Energinet to survey the entire Danish North Sea instead of having 4 single surveys in 2024. As we only use densities to inform about density and abundance in the months where the surveys were carried out, we do not need to justify further. The PAM data is used to inform on presence year round.</p>	LKY/LIAK
----	---	-------------	----------------	--	----------

	<p>1) Try to delete the word 'harbour porpoise' from the chapter and substitute it with 'ceteceans'. Point is, the survey programme is designed to register ceteceans, not just harbour porpoise. The result that only harbour porpoise were observed belongs in the result chapter.</p> <p>2) Please add a description of data analysis:</p> <ul style="list-style-type: none"> - How did you assure data consistency and quality (already well described) - Did you do any calculations from the raw data of e.g. density (individuals/km²) within the pre-investigation area? Describe how you translate data from the Entire North Sea into information on marine mammals use of the pre-investigation area. <p>09-07-2024: Ok</p>	3.2.3, p 32	KTO 18-06-2024	<p>1) In the chapter there is a clear separation between harbour porpoises and other cetaceans. The text is retained as it is important to separate between the methods used. FPODs are not used for other cetaceans and SoundTraps are not used for harbour porpoises.</p> <p>2) I am not sure this comment is for the chapter on PAM? PAM does not provide density.</p>	
15	<p>1) To align with heading 3.1.1 and 3.2.1 please rename heading to 'Passive acoustic monitoring survey – ceteceans'</p> <p>2) The introduction text in 3.2.4 is well written and informative, but the long text also makes the chapter a little less focused – consider shortening the text.</p> <p>3) Consider following the same structure as indicated in comment 13 to keep the information short and concise.</p> <p>09-07-2024: Ok</p>	3.2.4, p 32	KTO 19-06-2024	<p>1) Ok</p> <p>2) and 3) text retained</p>	LKY/LIAK
16	<p>Consider changing heading to '3.2.4.2 FPOD analysis – harbour porpoise' to help the reader maintaining an overview</p> <p>09-07-2024: Ok</p>	3.2.4.2, p 35	KTO 19-06-2024	ok	LKY/LIAK
17	<p>1) Consider changing heading to '3.2.4.3 Soundtrap analysis – other cetaceans' to help the reader maintaining an overview</p> <p>2) Please change 'Analysis' to 'analysis' in heading</p> <p>09-07-2024: Ok</p>	3.2.4.3, 36	KTO 19-06-2024	ok	LKY/LIAK



18	<p>1) Structure here is a bit confusing to the reader here – if data is recoded with the Soundtraps, should this have been a part of subchapter 3.2.4.3 (i.e. 3.2.4.3.1)? Please consider if you need to add more explanation, or change structure.</p> <p>2) Please change 'Analysis' to 'analysis' in heading</p> <p>09-07-2024: Ok</p>	3.2.4.4, p 36	KTO 19-06-2024	<p>1) chapter changed to 3.2.3.3.1</p> <p>2) ok</p>	LKY/LIAK
19	<p>Is it an error, that the heading is underlined? Consider revising</p> <p>09-07-2024: Ok</p>	3.2.4.4.1, p 37	KTO 19-06-2024	Underlining removed	



20	<p>1) Consider renaming this subchapter 'Uncertainties' or something similar.</p> <p>2) I suggest to rephrase the introduction a bit, to provide a bit more objectivity and context. Also, please do not leave out the findings from the Nordsø 1 project – this is really important that the survey design is not undermined by uncertainties.</p> <p>Suggestion, please revise critically: 'Ceteceans use vocal communication, and some ceteceans species are known to avoid areas with increased levels of underwater noise from anthropogenic sources. Danish coastlines are subject to an elevated level of underwater noise caused by sources such as shipping traffic, fisheries, and construction works. It is unknown, whether individual cetacean species adapt to such elevated background noise, or if they are either attracted to or dispersed from impacted areas, although curious species such as harbour porpoise are often observed near fishing vessels and offshore platforms. The North Sea is generally highly impacted by noise from shipping, fisheries and construction works. During the marine mammals survey, geophysical surveys were conducted in the phase 1 area. Among the equipment used was USBL... [add your text]'</p> <p>10-07-2024: We maintain our concern regarding the text in chapter 3.2.5. Please revise the following (and review chapter 6 accordingly):</p> <p>1. 'Following the two years of baseline surveys, it came to light....' bør skrives om til 'During the two years of baseline surveys, geophysical surveys were.....'</p> <p>2. 'It is known to be able to cause behavioural changes...' bør skrives om til 'The sound from USBL can potentially exceed the threshold for behavioural changes in harbour porpoises up to a range of 3.5 km....' (det er jo noget man har modelleret på baggrund af ét sæt af målinger ifm Energjø Nordsøen)</p>	3.2.5, p 37	KTO 19-06-2024	<p>1) Good idea.</p> <p>2) We have no conclusion on the North Sea 1 project yet. Only in terms of possible disturbance ranges, which are now included in the chapter. The effect on actual PAM data is scheduled to be examined in August-September 2024, if Energinet chooses to do so. We have rephrased the chapter and included a more broad opening with classic references to impacts of underwater noise on cetaceans. It would disturb the clarity by writing more in the general introductory terms than now included. The text is therefore mostly retained.</p> <p>10-07-2024:</p> <p>1) Ok, but it was not known by the people planning the marine mammal surveys and writing this report until late autumn 2023.</p> <p>2) It is correct that it is based on modelling of recordings from the North Sea. The sentence is changed to: <i>"Based on recordings of a previous geophysical survey in the North Sea, it was modelled that the USBL recorded there, exceeded the threshold for behavioural reactions in harbour porpoises of $L_{(p,rms,125ms,VHF)}=103$ dB re. $1\mu Pa$ (Tougaard, 2021), at a range about 3.5 km (Pace, Robinson et al. 2021), because the USBL uses frequencies in a range where harbour porpoises are very sensitive (18 kHz - 32 kHz) along with a very high source level"</i></p> <p>3) ok</p> <p>4) and 5) We have looked in to the contract for the North Sea 1 survey program whereunder the analyses of USBL noise was examined. As it is not permitted to publish results hereof, we have hence removed the actual deterrence ranges from this report. The ranges are however correct and the analyses finished. We have explained in the text that the results are expected to become available Fall 2024. The text now reads:</p> <p><i>"The North Sea 1 baseline survey has also been conducted simultaneously with execution of geophysical surveys. Here, a study was launched to examine the extent of USBL signals in the wideband recordings made</i></p>	LKY/LIAK
----	--	-------------	----------------	--	----------



	<p>3. Betegnelsen 'Lot 1' skal fjernes – den bruges udelukkende internt.</p> <p>4. Hvad er referencen 'Mikaelsen, Nørholm... 2024' – jeg mener ikke, at det er noget Energinet har godkendt. Hvis det er det notat, om undersøgelserne af USBL-støj, som NIRAS/DCE leverede til Energinet den 24. juni 2024, så er det IKKE godkendt og må ikke bruges som reference.</p> <p>5. Jeg vil foreslå, at I i stedet skriver 'Here, a study has been launched to examine the extent of USBL signals in the wideband recordings made as part of the PAM cetacean survey. The results of this study will be ready and published in late autumn 2024. At the writing of this report.....'</p>			<p><i>as part of the PAM cetacean survey. The analyses are finished and are expected to be published fall 2024 by the Danish Energy Agency. At the writing of this report, actual impact on PAM data had not been examined. Such an impact may be deterrence and hence a reduced level of PAM detections. This means that in periods where geophysical surveys were conducted simultaneously with PAM and aerial surveys, the results from nearby PAM stations may be negatively biased. However, to examine the effect of geophysical surveys and USBL was not within the scope of this work, but it should be kept in mind when reviewing the results."</i></p> <p>Chapter 6 is accordingly revised.</p>	
21	<p>There is something odd with the report structure:</p> <p>3.1 Seals, 3.2 Ceteceans 3.3 Tagging of marine animals?</p> <p>Is it possible to correct this to?:</p> <p>3.1 Aerial surveys 3.2 Passive acoustic monitoring surveys 3.3 Tagging surveys</p> <p>09-07-2024: Ok</p>	3.3, p	KTO 19-06-2024	<p>We would like to the structure as it is since there is only one overlap in methods between seals and cetaceans, it makes more sense to structure based on species group.</p>	LKY/LIAK



22	<p>1) The result chapter could benefit from more structured headings – it is quite hard for the reader to keep track on what is reported where.</p> <p>Suggestion:</p> <ul style="list-style-type: none"> 4.1 Seals <ul style="list-style-type: none"> 4.1.1 Aerial surveys <ul style="list-style-type: none"> 4.1.1.1 Harbour seal 4.1.1.2 Grey seal 4.1.1 Tagging surveys 4.1.3 Overall results of survey programme (in relation to report objective, incl. discussion in relation to existing knowledge) 4.2 Ceteceans <ul style="list-style-type: none"> 4.2.1 Aerial surveys <ul style="list-style-type: none"> 4.2.1.1 Harbour porpoise 4.2.1.2 Other ceteceans 4.2.2 Pam surveys 4.2.3 Tagging surveys 4.2.3 Overall results of survey programme (in relation to report objective, incl. discussion in relation to existing knowledge) <p>You run into problems in section 4.3.3 with presentation according to marine mammal species. alternatively, you could present results according to survey type:</p> <ul style="list-style-type: none"> 4.1 Aerial surveys <ul style="list-style-type: none"> 4.1.1 Onshore haul-sites <ul style="list-style-type: none"> 4.1.1.1 Harbour seal 4.1.1.2 Grey seal 4.1.2 Pre-investigation area <ul style="list-style-type: none"> 4.1.1.1 Harbour seal 4.1.1.2 Grey seal 4.1.1.3 Harbour porpoise 4.1.1.4 Other cetaceans 4.1.3 North Sea <ul style="list-style-type: none"> 4.1.1.1 Harbour seal 4.1.1.2 Grey seal 4.1.1.3 Harbour porpoise 4.1.1.4 Other cetaceans 4.2 PAM surveys <ul style="list-style-type: none"> 4.2.1 Pre-investigation area 	4.1, p 44	KTO 19-06-2024	<p>1) As there is only overlap between the methods for the two species groups in tagging, it makes more sense to structure based on species. We retain the structure, but have included an introduction: “In this chapter, results from all surveys are presented. The chapter is structured based on species groups, namely pinnipids and cetaceans, since the only method shared by the two groups is tagging. Tagging was only successful for pinnipids and results are therefore presented under pinnipeds. For pinnipids, aerial surveys at haul-outs and tagging was conducted. For cetaceans aerial surveys in the extended survey area and passive acoustic monitoring surveys were conducted.” Results for the two seal species is now presented as fourth level sub chapters.</p> <p>2) ok, text deleted. It just seems weird not to mention that data was collected in 2023, but could not be included.</p> <p>3) We have previously been asked <i>not</i> to discuss results, not to compare with other areas etc. but only present data as they are. We have not been inform that this view have changed, which is why no discussion was included in the report</p>	LKY/LIAK
----	---	-----------	----------------	--	----------



	<p>4.2.1.1 Harbour porpoise 4.2.1.2 Other cetaceans 4.3 Tagging surveys 4.3.1 Onshore haul-sites 4.3.1.1 Harbour seal 4.3.1.2 Grey seal 4.3.1.3 Harbour porpoise 4.3.1.4 Other cetaceans 4.4 Overall results of survey programme (in relation to report objective, incl. discussion in relation to existing knowledge)</p> <p>2) The introduction text is outside the scope of the report, please delete it. Instead, it would be very helpful to the reader to be presented with a readers guide for the chapter.</p> <p>3) Overall, you are missing a discussion of your findings in relation to your expectations based on literature review – this should either be included in the results chapter or in the conclusion chapter.</p> <p>09-07-2024: Ok Regarding 3) I was unaware of this, also after reading reports on Fish and Fisheries and Birds where results are discussed in relation to expectations. However, due to the deadline of delivery, no action is required here.</p>				
23	<p>Heading is a little misleading, since the subchapter does not present results. However, very nice with an overview table.</p> <p>Suggestion: Change heading to '4.1.1 Aerial surveys' and substitute '+' and '%' with number of sightings of grey and harbour seal. You have then provided the reader with a very helpful guiding overview of results, before presenting the nice visual figures 4.1 and 4.2 (Please do the same for cetaceans).</p> <p>09-07-2024: Ok</p>	4.1.1, p 44	KTO 19-06-2024	<p>Heading changed as suggested.</p> <p>It is not possible to do the same figures (4.1 and 4.2) for cetaceans. PAM data does not provide number of animals and only 2 aerial surveys were conducted in 2022.</p>	LKY/LIAK



24	<p>1) Structure of headings are a bit confusing to the reader.</p> <p>Suggestion: Change headings to '4.1.1.1 Harbour seal' and '4.1.1.2 Grey seal'</p> <p>2) Please, you need to add your results in relation to answering the report objective: I.e. based on the aerial surveys what is the expected/analysed/calculated usage of the pre-investigation area by seals? It is not clear to the reader, how you have used the on-shore aerial survey to answer this question. Is it left out because this data analysis has not been done?</p> <p>But you did do aerial surveys in the pre-investigation area – were you also looking for seals here? If yes, the survey should be describes in the report (method and results respectively). Did you observe any? This would be valuable information to include in the report.</p> <p>09-07-2024: Ok</p>	4.1.2 and 4.1.3, p 44-45	KTO 19-06-2024	<p>1) changed, as suggested. 2) It is now included in the conclusion chapter.</p> <p>Seals were only sporadically observed during aerial surveys for cetaceans in the pre-investigation area and with too few observations to do density and abundance estimations. This was expected and it was therefore not included in the scope or method section. The results are nevertheless reported. The results are moved to the pinniped chapter.</p> <p>The following has now been included in the method section for pinnipids: "Seals are observed sporadically during aerial surveys for cetaceans and position is logged for every sighting. However, due to the small number of observations, density and abundance estimates cannot be calculated."</p> <p>And in the method section on aerial surveys for cetaceans: "During the aerial surveys, all marine mammal observations were logged, however it was only expected that there would be enough observations of harbour porpoises to provide density and abundance estimates."</p>	LKY/LIAK
25	<p>ENDK has not reviewed this section, because it is marked as pending after agreement.</p> <p>Please consider comment 22-24 when adding the text to this subchapter.</p> <p>09-07-2024: Ok</p>	4.2, p 46	KTO 19-06-2024	The final and approved version of the tagging report has now been incorporated.	LKY/LIAK
26	<p>1) Structure of headings in the results chapter are a bit confusing to the reader.</p> <p>Suggestion: Change this heading to 'Aerial surveys'.</p> <p>2) Text is repetition from methodology chapter, please delete. Instead, it would be very helpful to have an overview presented for ceteceans (all species investigated, not only harbour porpoise) as you did for seals (i.e. please apply consistency to help the reader), se comment 23.</p>	4.3.1, p 59	KTO 19-06-2024	<p>1) ok, heading changed 2) text deleted. Good idea, an introduction is included as follows: "Cetacean presence in the pre-investigation area was investigated with the following methods; aerial surveys, passive acoustic monitoring for harbour porpoises and passive acoustic monitoring for other cetaceans (white-beaked dolphins, mink whales and unidentified delphinids, including killer whales) and tagging. Tagging was however not successful for cetaceans and no results can be reported in this chapter."</p>	LKY/LIAK

	<p>1) Structure of headings in the results chapter are a bit confusing to the reader.</p> <p>Suggestion: Apply same structure as in 4.1, i.e. rename this chapter 'Harbour porpoise'. I suggest starting by presenting the very nice overall result table 4.6, which does not belong in subchapter 4.3.1.3. Also, for simplicity, consider leaving out heading 4.3.1.2 and 4.3.2.3.</p> <p>09-07-2024: Ok</p>	4.3.1.1, p 59		<p>The heading cetaceans is retained. It is already noted in the first line of sub chapter 4.3.1 that only porpoises provided enough observations for density and abundance estimation.</p> <p>The subheadings are removed. Table 4.6 moved to beginning of chapter. Table 4.7 also moved further up.</p>	LKY/LIAK
27	<p>1) Heading is confusing. It mentions cetaceans, but only results for harbour porpoise is presented in the chapter – is that a mistake?</p> <p>Suggestion: If the scope of the North Sea program is harbour porpoise, I suggest to merge chapter 4.3.2 with the chapter about harbour porpoise, so you can make coherent presentation of results for harbour porpoise.</p> <p>2) 'Pooling' – see comment 14</p> <p>3) Figure text 4.17: You have previously stated in the methodology, that the project was also funded by the Danish Energy Agency. Please apply consistency and make the correct statement</p> <p>09-07-2024: Ok</p>	4.3.2, p 62	KTO 19-06-2024	<p>1) Heading is removed. Subchapter included in main chapter. See answer to comment 26 point 1).</p> <p>2) Explained – see answer further above</p> <p>3) The figure text is correct. Changed in methods' chapter</p>	LKY/LIAK

28	<p>1) Heading is confusing – please do not present data for seals in the chapter for cetaceans (4.3). If you have decided to present results according to marine mammal species instead for survey methods, you need to implement it to not confuse the reader 😊</p> <p>2) Please do not introduce new methodology not previously mentioned in the results chapter. If results from bird surveys are included, please the present it in the methodology chapter.</p> <p>09-07-2024: Ok</p>	4.3.3, p 65	KTO 19-06-2024	<p>1) and 2) A chapter is now included in the method section for seals: “3.2 Seal observations during other aerial surveys Seals are encountered sporadically during aerial surveys for birds (please see method in the technical report for birds) and during aerial surveys for cetaceans (please see chapter 3.3.1). Position is logged for these seal observations, but since the two seal species cannot be separated from the air, and since few observations are expected, density and abundance estimations are not calculated for seals.”</p> <p>Results are presented separately for seals in chapter 4.1 Pinnipids: “Seals were counted for this survey program during 2022. Seals were sporadically encountered during surveys for cetaceans (chapter 3.2.1) and birds (please see method in technical background report for birds). The seal observations are reported in Table 3. 3 below. As expected, there are too few observations to estimate abundance and density and the two seal species could not be separated from the air.”</p>	LKY/LIAK
29	<p>You have mentioned the survey height in feet, isn't it better/more consistent to use meters?</p> <p>09-07-2024: Ok</p>	4.3.3, p 65	MDW 19-06-2024	<p>This is the standard for aerial surveys and allows direct comparison with methods and results from other aerial surveys.</p>	LKY/LIAK
30	<p>Very nice that you have provided the results for recording days 😊</p>	4.3.4, p 4.11	KTO 19-06-2024	<p>Thanks 😊</p>	LKY/LIAK
31	<p>Killer whales were also included in the report objective, therefore you should report on your results for this species – this is missing.</p> <p>09-07-2024: Ok</p>	4.3.8?, p 84	KTO 19-06-2024	<p>A chapter on killer whales have been included: “4.3.7 Killer whales Killer whales are dolphins and their signals are potentially included in chapter 4.3.6 as ‘unidentified delphinids’. Unidentified delphinids were recorded 5-15 % of the days in year 1 and 8-19% of the days in year two. Since there a very few killer whales in the North Sea (please see chapter 2.2.4) it does not appear likely that unidentified dolphins only represents killer whales. It was not possible to tag any killer whales as none was observed during the tagging survey. Despite the robust survey design with PAM, aerial surveys and tagging it is not possible to draw firm conclusions on the area’s significance for killer whales. It should, however, be assumed that killer whales can occur in the pre-investigation area. ”</p>	LKY/LIAK

32	<p>Please rename chapter 'Conclusion' (as commented to the tagging and fish reports as well).</p> <p>Please be careful that you have added a clear conclusion that answers the report objective – to what extend do marine mammals use the pre-investigation area?</p> <p>09-07-2024: Ok</p>	5, p 85	KTO 19-06-2024	<p>We have named it 'Conclusion'.</p> <p>It is not always possible to draw firm conclusions even with a robust survey design. If data is not sufficient, we will not draw a conclusion on them. This is now clarified in the beginning of the chapter, and where relevant.</p>	LKY/LIAK
33	<p>1) Aside from conclusions and the tagging study, it is not clearly stated what the conclusions from your surveys are in relation to existing knowledge and conducted surveys.</p> <p>Please state your conclusions from the various surveys (Aerial surveys haul site/pre-investigation area/North Sea plus tagging) clearly.</p> <p>Suggestion (please check carefully): "Harbour seal: The pre-investigation area is located x km away from the nearest haul-site. Studies show (reference) that harbour seals rarely make foraging trips further away than x km from hauls sites, and therefore it is unlikely that the pre-investigation area is used intensively as foraging ground by harbour seal from the investigated populations. This was supported by the offshore aerial surveys, where only few individuals from the populations were sighted in the pre-investigations area, and by the tagging survey where harbour seal was shown not to migrate to the pre-investigation area."</p> <p>09-07-2024: Ok</p>	5.1, p 85	KTO 19-06-2024	<p>1) Seals were only counted at their haul-outs, as they cannot be separated to species from the air, and tagged. These are the results for the two seal species.</p> <p>The following has been included in the chapter: "The number of hauled out harbour seals at the two nearest haul-outs at different times of the year, represent the Danish part of the North Sea harbour seals that potentially could use the North Sea Energy Island pre-investigation area. Seals were not counted specifically in the pre-investigation area, as it is not possible to separate species from the air, but seals were observed in the area during cetacean surveys, and harbour seals has previously been observed as far offshore as in the Danish oil and gas sector. Instead seals were tagged at the haul-out in Nissum Bredning/Thyborøn to inform on potential use of the pre-investigation area. The tagged harbour seals (n=27) comprise only a small proportion of the seals hauling out in Nissum Bredning. Nevertheless, the analysis of the tagged individuals indicates that the Energy Island pre-investigation area was used little by the tagged seals. On average harbour seals spent 0.1 % of their time in the phase 1 area (up to 87 hours for one individual). The habitat suitability model predicted the area to be of low to medium suitability for harbour seals. The analyses of track convolutedness did not indicate that seals foraged more in the phase 1 area than elsewhere. There are some constraints to this conclusion since mainly male harbour seals were caught and tagged.</p>	LKY/LIAK



34	Same as comment number 32 09-07-2024: Ok	5.2, p 85	KTO 19-06-2024	<p>The following has been included: "The number of hauled out grey seals at the two nearest haul-outs at different times of the year, represent the Danish part of the North Sea grey seals that potentially could use the North Sea Energy Island pre-investigation area. Seals were not counted specifically in the pre-investigation area, as it is not possible to separate species from the air, but seals were observed in the area, and are known, and shown to traverse the North Sea. Grey seals (n=15) were tagged at the haul-out in Nissum Bredning/Thyborøn and Helgoland (n=33) to inform on potential use of the pre-investigation area. The tagged grey seals comprise only a small proportion of the seals hauling out in Nissum Bredning – the closest haul out to the pre-investigation area. Nevertheless, the tracks of the tagged individuals indicate that the Energy Island pre-investigation area was little used by grey seals, which was also supported by the habitat suitability model built on the tracking data. Grey seals tagged at Thyborøn spent 0.2% of their time (up to 23 hours) in the phase 1 area, while grey seals tagged at Helgoland spent 0.05 % of their time in the phase 1 area. The habitat suitability model predicted the area to be of medium to high suitability for grey seals. The analyses of track convolutedness did not indicate that seals foraged more in the phase 1 area than elsewhere. There are some constraints to this conclusion since mainly juveniles, and few adult male grey seals and very few female seals were tagged."</p>	LKY/LIAK
35	Change last word section 2 'Summer' to 'summer' 😊 09-07-2024: Ok	5.3, p 86	KTO 19-06-2024	ok	LKY/LIAK



35	<p>1) The text in this chapter is a bit inconclusive with respect to the report scope. Could you please qualify your conclusion a bit more?</p> <p>Assuming the experimental design is robust to study presence of minke whales, you should be able to conclude something from you results. If it is not robust, please mention it in the methodology chapter.</p> <p>If there was uncertainty about what type of signals to base the analysis upon, this should be introduced in the methodology chapter, and not be mentioned first time in the conclusion.</p> <p>Please describe in the text how one visual and no acoustic observations correspond to your expectations from existing knowledge? Are minke whales often or rarely spotted in the area? Are they likely to visit the area for mating or foraging, or not? How does that correspond to your findings? Could there be a relation between few observations and low presence? Or is the seasonal variability of the species migrations patten too large for that?</p> <p>2) Also, please be aware that the scope of the report is not to evaluate the status of mike whales in the area – that would be the scope of a long-term monitoring programme. Please revise your wording in this text, so the reader is not uncertain about the scope.</p> <p>09-07-2024: Ok</p>	5.5, p 86	KTO 19-06-2024	<p>Ok, background information and method section revised 😊</p> <p>A little information: Very little is known about what minke whales do and where they do it. For example where they mate and give birth. As stated in the introductory chapter on minke whales there are only data from two tagged individuals from the North Sea, and from the four SCANS' surveys. Our set-up is robust with regards to number of PAM stations and analysis methods, but since few recordings exists of minke whales, and none of them from onboard tags on the animals, there is no knowledge of all the sound types they produce, and especially context information. Our analyses is based on the sound type expected for the North Sea, based on PAM recordings from Scotland. That we didn't record minke whales, is not equal to the species not being present. Or that the set-up was not robust. This is a species with little knowledge on its acoustics, and therefore difficult to study with PAM until more knowledge becomes available. This is now clarified under results and in discussion.</p> <p>The following is now included in the background chapter on minke whales: "Very little context specific knowledge exists on their vocal repertoire. This study represents the first time that this part of the North Sea is surveyed with passive acoustics and it is not clear what to expect in terms of signals or seasonal pattern in presence. Absence of recorded signals should not be interpreted as an absence of presence of minke whales, as too little information exists on their context specific vocal repertoire."</p> <p>The following is included in the method section on minke whale analyses: "The vocal repertoire of minke whales is not well described, especially not in terms of context specific behaviour. It is for example not known when and why minke whales produce sounds, so it is not for certain that minke whales produce sound in the pre-investigation area. It has not previously been studied in this part of the North Sea. Absence of sounds should however not be taken as evidence of absence of the species in the pre-investigation area."</p> <p>2) The sentence reads: "This is not enough data to evaluate the status of the area for minke whales."</p>	LKY/LIAK
----	--	-----------	----------------	--	----------

36	Please revise this text according to you preliminary results from Nordsø I: 'It remains unknown what effect the concurrent geophysical surveys had on the distribution and abundance of harbour porpoises and white-beaked dolphins in the extended survey area.'	6, p 88	KTO 19-06-2024	As stated elsewhere above, there are no results on effects on PAM levels. However, the following phrase is included after the sentence written in the comment: "It was shown during the North Sea 1 USBL vs PAM analyses that the deterrence range may vary between 1.2 – 5.5 km radius from the survey vessel using a USBL and the harbour porpoise behavioural threshold for impact noise." The above is changed to: 11-07-2024: "It remains unknown what effect the concurrent geophysical surveys had on the distribution and abundance of harbour porpoises and white-beaked dolphins in the baseline survey program in the extended survey area. A report examining deterrence ranges and impacts on PAM levels in the North Sea 1 area is expected published by the Danish Energy Agency in Fall 2024."	LKY/LIAK
	New 09-07-2024. Typo: Please fill in footer, so the text does not say [Verified by] Project ID: 10412920 Document ID: RDJRNYPQ6AW5-451746203-14153 Prepared by: CHN Verified by: [Enter initials] Approved by: [Enter initials]	All pages	KTO	Done -sorry! Completely overlooked the footer.	
	New 09-07-2024: Typo Please change heading 4.1.8.1 Vulnerable periods for Killer whales in the North Sea to 2.2.4.1 Vulnerable periods for killer whales in the North Sea	Page 26	KTO	ok	
	New 09-07-2024. Typo: Please change heading 'Toothed whale Analysis' to 'Toothed whale analysis'	Page 39	KTO	ok	



	New 09-07-2024. Typo: Please fill in text, so it does not say '[# (update the table of contents with F9)]' and [Appendix Subheading]	Page 109	KTO	Yes, sorry!	
	New 09-07-2024. Typo: Please check document for correct spelling of pinnipids vs. pinnipeds. Consider replacing the word with 'seals' as in the last review version, since 'pinnipeds' is a less known word.	All pages	KTO	10-07-2024: We have chosen the word pinniped as it corresponds to our use of the word cetaceans. Spelling corrected.	