

REPORT

Boston Alternative Energy Facility

Outline Marine Mammal Mitigation Protocol

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Glossary of Acronyms

Acronym	Definition
BDMLR	British Divers Marine Life Rescue
<u>COLREGS</u>	<u>Convention on the International Regulations for Preventing Collisions at Sea</u>
CSIP	Cetacean Stranding's Investigation Programme
dB re 1 μ Pa	Decibel level in water (decibels per 1 micro pascal)
DCO	Development Consent Order
DML	Deemed Marine Licence
<u>EIA</u>	<u>Environmental Impact Assessment</u>
<u>IMO</u>	<u>International Maritime Organisation</u>
<u>IWC</u>	<u>International Whaling Commission</u>
JNCC	Joint Nature and Conservation Committee
km	Kilometre
km ²	Square Kilometres
<u>m</u>	<u>Metre</u>
<u>m/s</u>	<u>Metre per second</u>
MMO	Marine Management Organisation
MMObs	Marine Mammal Observer
MMMP	Marine Mammal Mitigation Protocol
MU	Management Unit
NMP	Navigation Management Plan
PAM	Passive Acoustic Monitoring
<u>PAM-Op</u>	<u>Passive Acoustic Monitoring Operator</u>
PTS	Permanent Threshold Shift
SCOS	Special Committee on Seals
<u>SE</u>	<u>South East</u>
SEL	Sound Exposure Level
SEL _{cum}	Sound Exposure Level (cumulative)
SEL _{ss}	Sound Exposure Level (single strike)
SNH	Scottish Natural Heritage (now NatureScot)
SPL _{peak}	Sound Pressure Level (peak)

1 Purpose of This Report

- 1.1.1 This Outline Marine Mammal Mitigation Protocol (MMMP) is for the Boston Alternative Energy Facility (the Facility). This report is provided on behalf of Alternative Use Boston Projects Limited (the Applicant), to support the application for a Development Consent Order (DCO) (the DCO application) for the Facility that has been made to the Planning Inspectorate under Section 37 of the Planning Act 2008 (the Act).
- 1.1.2 The purpose of this Outline MMMP is to define the measures to be put in place to mitigate the potential impacts of any physical injury or permanent auditory injury / change in hearing sensitivity (Permanent Threshold Shift (PTS)) to marine mammals associated with the construction and operation of the proposed Facility.
- 1.1.3 This Outline MMMP is secured by Condition 17 of the draft Deemed Marine Licence (DML) contained within Schedule 9 to the ~~The draft DCO (document reference 2.1(3), APP-005) contained a number of measures to protect marine mammals during piling operations and also from an increase in vessel presence associated with the Proposed Development during both construction and operation. These measures have been consolidated into this Outline MMMP and a new condition has been added to the draft Deemed Marine Licence (DML) contained within Schedule 9 to the latest version of the draft DCO (document reference 2.1(1)) submitted at Deadline 1, which requires a final MMMP to be approved by the Marine Management Organisation (MMO) following consultation with the statutory nature conservation body and Lincolnshire Wildlife Trust. The final MMMP submitted for approval must be in accordance with this Outline MMMP. The piling method statement (approved under Condition 13 of the DML) and the navigation management plan (approved under Condition 14 of the DML) are both required to contain measures for managing potential risks to marine mammals in accordance with the approved MMMP.~~
- 1.1.4 This Outline MMMP sets out the protocol of how the proposed Facility would mitigate impacts assessed in Environmental Statement Chapter 17 Marine and Coastal Ecology (document reference 6.2.17, APP-055), to reduce the likelihood of any potential physical or permanent auditory injury to marine mammals as a result of underwater noise during underwater piling operations and the presence of vessels during construction and operation.

1.2 Agreement on the Final MMMP

- 1.2.1 The final MMMP will be submitted for approval in accordance with Schedule 9, Condition 17 of the DdML;

17.—(1) The undertaker must submit a marine mammal mitigation protocol to the MMO for approval in accordance with the procedure in Part 45, following consultation with the relevant statutory nature conservation body and Lincolnshire Wildlife Trust, at least 13 weeks prior to the commencement of any of licenced activity.

(2) The marine mammal mitigation protocol submitted for approval under sub-paragraph (1) must be in accordance with the outline marine mammal mitigation protocol.

(3) The undertaker must not commence the licenced activities until the MMO has approved in writing the submitted marine management mitigation protocol.

(4) Unless otherwise agreed by the MMO, the marine mammal mitigation protocol must be implemented as approved by the MMO.

1.2.2 When finalising the MMMP, once the final piling design and methodologies are known, the Applicant will ensure the following information is provided on the pile design:;

- Types of pile;
- Number of each type of pile;
- Pile diameters;
- Piling methodologies;
- Hammer energy required for installation for each pile type (for any impact piling);
- Piling durations (for each pile, and in total for all piles and pile types); and
- Piling programme.
-

1.2.3 The final MMMP will be based on the mitigation measures as set out within this Outline MMMP. As set out in the Updated Piling Noise Assessment (document reference 9.16, REP1-029) there is unlikely to be any simultaneous piling as each pile location would have its own specific requirements, that would require previous piles to be installed in order for the next to be installed. The wharf piling duration (4 months) is predicated on almost continuous piling during the allowable construction hours without any simultaneous piling occurring.

1.2.4 If required, following final pile design, site specific underwater noise modelling would be undertaken to determine the maximum impact range for PTS. The modelled impact range for PTS will be used to determine the range over which monitoring by the Marine Mammal Observers (MMOs) from suitable vantage

points will need to be conducted, to reduce the risk of PTS in marine mammals that could be present in the area during piling operations. The underwater noise modelling would be undertaken for conditions at both high and low tides to determine potential requirements for mitigation measures during both these periods.

The final MMMP will be approved by the MMO in consultation with Natural England and Lincolnshire Wildlife Trust).

1.2.5

2 Summary of Potential Impacts to Marine Mammals

- 2.1.1 High exposure levels from underwater noise sources (such as impact piling) can cause permanent auditory injury or hearing impairment, through permanent loss of hearing sensitivity (PTS).
- 2.1.2 Piling at the Facility will be for both sheet piles and tubular piles, and will use impact piling. Sheet piles would take up to five minutes each to install, while tubular piles would take up to 15 minutes.
- 2.1.3 A number of piling rigs would be on site at any one time, allowing for the next piles to be placed in readiness for piling, while the previous are installed. It is possible that there would be continuous piling, as there would sufficient rigs on site to allow for changeover times to occur while other piles are installed. However, it is unlikely that there would be any simultaneous piling as each pile location would have its own specific requirements, that would require previous piles to be installed in order for the next to be installed. A maximum of 96 sheet piles could therefore be installed in any one day, and a maximum of 48 tubular piles.
- 2.1.4 PTS can occur instantaneously from acute exposure (Sound Exposure Level (SEL)) to high noise levels, such as single strike (SEL_{ss}) of the maximum hammer energy during piling. PTS can also occur as a result of prolonged exposure to increased noise levels, such as during the duration of pile installation (SEL_{cum}).
- 2.1.5 Due to the water levels at the Facility during low water (or within three hours of low water), noise levels are not expected to propagate at distance from the sound source. ~~Therefore, there is not expected to be any significant levels of noise for piling undertaken during low water,~~ however, all piling is expected to be subject to the and the mitigation measures/procedures as provided within this Outline MMMP ~~are only required for piling during periods of deeper water or high water (or within three hours of high water) to be on a precautionary basis. This will be~~

confirmed in the final MMMP following final pile design, and site specific underwater noise modelling (if required).

- 2.1.6 **Table 2-1** ~~Table 2-1~~ summarises the assessments relevant to the Outline MMMP for underwater noise impacts to harbour seal due to piling, dredging, and vessels, during construction and operation, and the potential for an increase in collision risk with vessels, during construction and operation. Further information on these assessments is within Chapter 17 Marine and Coastal Ecology¹, Appendix 17.1 Habitats Regulations Assessment², and the Marine Mammal Addendum (document reference 9.14).

¹ 6.2.17 Environmental Statement - Chapter 17 - Marine and Coastal Ecology [APP-055]. Available from: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010095/EN010095-000440-6.2.17.%20Chapter%2017%20Marine%20and%20Coastal%20Ecology.pdf>

² 6.4.18 Environmental Statement - Appendix 17.1 - Habitats Regulations Assessment [APP-111]. Available from: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010095/EN010095-000490-6.4.18.%20Appendix%2017.1%20Habitats%20Regulations%20Assessment.pdf>

Table 2-1 Summary of underwater noise assessments (PTS) and vessel collision risk for marine mammals (harbour seal only)

Potential impact	Criteria and threshold	Impact range (and area)	Maximum number of individuals (% of reference population)	Magnitude	Sensitivity	Impact significance	Mitigation
Construction related impacts only							
PTS from single strike piling	218 dB re 1 μ Pa SPL _{peak} unweighted impulsive criteria (Southall <i>et al.</i> , 2019)	0m (0km ²)	0 harbour seal	No potential for impact.	High	No impact.	Mitigation for piling at high water following Joint Nature Conservation Committee (JNCC) Protocol (JNCC, 2010), as outlined in Section 3.1 and Box 1
PTS from cumulative piling	185 dB re 1 μ Pa ² s SEL _{cum} weighted impulsive criteria (Southall <i>et al.</i> , 2019)	90m (<0.01km ²)	0.008 harbour seal (based on the harbour seal density of 0.80/km ² at the Application Site) ³ . 0.0002% of the South East (SE) England Management Unit (MU) population ⁴ . 0.0003% of the most recent count of adult seals in The Wash ⁵ .	Permanent effect with negligible magnitude (less than 0.001% of the reference population anticipated to be exposed to effect).	High	Minor adverse	
PTS from dredging a Activities (cumulative)	201 dB re 1 μ Pa ² s SEL _{cum} weighted non-impulsive criteria	<10m (0.0003km ²)*	0.0002 harbour seal (based on the harbour seal density of 0.80/km ² at the Application Site). 0.000005% of the SE England MU population.	Permanent effect with negligible magnitude (less than 0.001% of the reference population)	High	Minor adverse	No mitigation required as highly unlikely that marine mammal would be in very close vicinity

³ Russell et al., 2017

⁴ Special Committee on Seals (SCOS), 2020

⁵ SCOS, 2020

Potential impact	Criteria and threshold	Impact range (and area)	Maximum number of individuals (% of reference population)	Magnitude	Sensitivity	Impact significance	Mitigation
	(Southall <i>et al.</i> , 2019)		0.000008% of the most recent count of adult seals in The Wash.	anticipated to be exposed to effect).			(<10m) for 24 hours or more.
Construction and operation related impacts							
Increased risk of collision for marine mammals (impact zone includes the Wash as a transit area) during both construction and operation [5% at increased risk]	-	10.46km ²	1.7 harbour porpoise (based on the harbour seal density of 3.189/km ² over whole project area). 0.05% of the SE England MU population. 0.07% of the most recent count of adult seals in The Wash.	Permanent effect with medium magnitude (between 0.01% and 0.1% of the reference population anticipated to be exposed to effect).	Low	Minor adverse	Mitigation for vessels as outlined in Section 3.3 and Box 2

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3 Marine Mammal Mitigation Measures

3.1 Piling

3.1.1 As a precautionary approach, mitigation will be undertaken for all piling works ~~conducted three hours either side of high water~~, to ensure that any potential impact to marine mammals (and fish species) are reduced as far as is possible. These measures are secured as part of the piling method statement required by condition 1373 of the DML (Schedule 9 to the draft DCO (document reference 2.1(34)), which requires the piling method statement to include measures for managing potential risks to marine mammals in accordance with the approved MMMP.

3.1.2 Piling would be undertaken between June and September only, to reduce the potential for impact to ecological receptors such as overwintering birds.

3.1.23.1.3 ~~This mitigation would include (as is described further below):~~

- Pre-piling watch for marine mammals, ~~when piling activities are undertaken within three hours of high water~~, following the standard JNCC ‘Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise’ (JNCC Protocol)⁶ (JNCC, 2010) for minimising the risk of injury to marine mammals from piling noise; and
- Soft-start and ramp-up procedures, for piling activities, where possible taking into account final pile design (and durations) ~~undertaken within three hours of high water.~~

3.2 Mitigation Protocol for Piling

3.2.1 A flowchart of the mitigations for piling ~~(for commencement during high water⁷ only)~~ is included in Box 1 ~~Box 1~~. See **paragraph 2.1.5** for more information.

Pre-Piling Watch

3.2.2 For any piling activity ~~that commences three hours either side of high water~~, a pre-piling watch will be undertaken for a period of at least 30 minutes prior to piling. This will be undertaken by fully qualified and experienced Marine Mammal Observers (MMObs) during hours of daylight and good visibility (as defined within

⁶Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise, 2010. <https://data.jncc.gov.uk/data/31662b6a-19ed-4918-9fab-8fbcff752046/JNCC-CNCB-Piling-protocol-August2010-Web.pdf>

⁷High tide⁷ should be considered to be a period of three hours either side of high tide

the JNCC MMOB recording forms⁸ as more than 1km in all directions [noting the restrictions set out in paragraph 3.1.6]).

3.2.3 Due to the piling programme restrictions of being undertaken in daylight hours only⁹, the use of the majority of watches are expected to be completed using MMOBs, however, in the case that there is low visibility due to fog (or other adverse weather conditions), noting that no piling would be undertaken in darkness due to the daytime piling restrictions¹⁰, and the piling is to commence in periods of high water, then Passive Acoustic Monitoring (PAM) is not currently considered in this Outline MMAP could be utilised to undertake the pre-watch. PAM is not an optimum method of detecting seal species (as they tend to vocalise less underwater than cetacean species)), therefore, wherever possible, piling would not commence in hours of poor visibility. PAM should only be undertaken by suitably trained and experienced PAM Operators (PAM-Ops).

3.2.4 The pre-piling watch should monitor a 500m radius around the piling location (referred to as the mitigation zone). Note that due to the location of the BAAEFF Facility, it may not be possible to see the entire mitigation zone from all piling locations (due to the bend in the river to the north of the BAEF, however, the minimum viewable distance would be at least 150m at all times, and the full 500m mitigation monitoring zone would be used wherever possible to do so. Although it is important to note that the maximum potential PTS range of 90m would be visible at all times and for all piling locations.

3.2.4.3.2.5 Ifn the case that marine mammals are detected within the mitigation monitoring zone, the commencement of piling would be delayed until the marine mammal is outside of the mitigation monitoring zone for 20 minutes, and the full 30 minute pre-piling watch has been completed.

Soft-Start and Ramp-Up Protocol

3.2.5.3.2.6 The soft-start and ramp-up procedure for piling, where is it technically possible taking into account final pile design (e.g. durations)if possible, will be conducted prior to any piling that commences within three hours either side of high water. Each piling event will commence with a hammer energy at as low as is reasonably practical, followed by a gradual ramp-up to full hammer energy. Note that, due to the very short expected piling times of five minutes or 15 minutes per pile (dependent on pile type), the full soft-start procedure as stated within the JNCC Piling Protocol (JNCC, 2010) may not be possible. However, the piling,

⁸ Marine Mammal Recording Form <https://data.jncc.gov.uk/data/e2a46de5-43d4-43f0-b296-c62134397ce4/Deckforms-rev04.doc>

⁹ Of between 7am and 7pm, or 8am and 8pm, during the summer months only (of June to September)

¹⁰ Of between 7am and 7pm, or 8am and 8pm, during the summer months only (of May/June to September)

where possible, would commence with hammer energies as low as is reasonably practical, with a ramp-up to full hammer energy for as long a period as is possible.

~~3.2.63.2.7~~ This procedure is only required where ~~piling commences within three hours of high water, and where~~ there has been no piling for the preceding 10 minutes (i.e. if piling continues at a new location within 10 minutes of a pile being installed, as is expected, then this soft-start and ramp-up protocol would not be required).

~~3.2.73.2.8~~ If a marine mammal enters the ~~mitigation monitoring~~ zone during the soft-start and ramp-up procedure, then, if possible, the piling energy will not increase until the marine mammal exits the ~~mitigation monitoring~~ zone.

Full Piling Sequence

3.2.9 Due to the specific piling requirements of this project, with a piling period of five minutes for each sheet pile, and 15 minutes for each tubular pile, 'full piling' refers to a sequence of piling, at different piling locations, with no break in overall piling (i.e. a piling sequence would include multiple sheet piles, and the next pile sequence would commence only when there is a break of more than 10 minutes in piling).

~~3.2.83.2.10~~ When piling at full power, there is no requirement to cease piling or reduce the power if a marine mammal is detected in the ~~mitigation monitoring~~ zone.

Breaks in Piling

~~3.2.93.2.11~~ In the event that piling activity is stopped for more than 10 minutes, the piling coordinator would ensure that the pre-piling watch, soft-start and ramp-up procedure (if possible) is conducted prior to piling re-commencing, ~~if the piling sequence re-commences in a period three hours either side of high water.~~

~~3.2.103.2.12~~ If a watch has been undertaken in the 30 minute period prior to the piling sequence re-commencing ~~(either by a MMOb or by PAM)~~, then there would be no requirement for the full pre-piling monitoring to be undertaken, as the 30 minute watch has already been completed.

Reporting

3.2.13 Reporting would be undertaken following the JNCC Statutory protocols^{11,12} and in accordance with Condition 24 of the DML which requires reporting of impact

¹¹ Marine mammal recording forms - <https://data.jncc.gov.uk/data/e2a46de5-43d4-43f0-b296-c62134397ce4/Marine-mammal-recordingforms-rev04.xls>

¹² Marine mammal deck forms - <https://data.jncc.gov.uk/data/e2a46de5-43d4-43f0-b296-c62134397ce4/Deckforms-rev04.doc>

sound to the Marine Noise Registry:-

(1) Only when impact driven or part-driven pile foundations or detonation of explosives are proposed to be used as part of the foundation installation the undertaker must provide the following information to the Marine Noise Registry:

(a) prior to the commencement of the licenced activities, information on the expected location, start and end dates of impact pile driving/detonation of explosives to satisfy the Marine Noise Registry's Forward Look requirements; and

(b) within 12 weeks of completion of impact pile driving/detonation of explosives, information on the exact locations and specific dates of impact pile driving/detonation of explosives to satisfy the Marine Noise Registry's Close Out requirements.

(2) The undertaker must notify the MMO of the successful submission of Forward Look or Close Out data pursuant to paragraph (1) above within 7 days of the submission.

3.3 Vessels

3.3.1 Mitigation measures will be applied to reduce the potential impacts due to the increased number of vessels in the area (the potential for an increase in collision risk and disturbance from vessels). These are referred to as best practice measures, and are summarised below:

- Observers on board each vessel, monitoring for marine mammals as the vessel makes its way through The Wash and up The Haven.
- Safety, weather and tidal conditions permitting, vessel speed limits of 6 knots for all vessels travelling within The Haven and The Wash, will reduce the potential for fatal collisions with marine mammals, including harbour seal.
- Safety permitting, vessels will maintain the same course (if possible) and speed to give, if required, any seal time to avoid the vessel.

3.3.2 The observers on the vessels can be non-dedicated, and therefore can be a member of the vessels crew, provided that they do not undertake other duties while they are required for marine mammal observations. They should still be qualified as an MMOB, with a JNCC accredited training course.

3.3.3 The best practice measures for vessels travelling through and into The Wash and The Haven are shown in **Box 2Box 2**.

3.3.4 These measures will form part of the Navigation Management Plan (NMP) secured by Requirement 14 of the draft DCO.

Best Practice Measures for Vessels during Construction and Operation

3.3.5 The best practice measures follow the relevant principles as outlined in:

- The Sea Watch Foundation Pinniped Code of Conduct (Sea Watch Foundation, 2021)¹³;
- Cornwall Marine and Coastal Code Guidelines (Cornwall Marine and Coastal Code Group, 2017)¹⁴;
- Scottish Marine Wildlife Watching Code Parts 1¹⁵ and 2¹⁶ (Scottish Natural Heritage (SNH) (now NatureScot), 2017a; SNH, 2017b);
- The Wash & North Norfolk Coast Wild Recreation Guide (The Norfolk Coast Partnership, 2021)¹⁷; and
- North Norfolk District Council Personal Watercraft Code of Conduct (North Norfolk District Council, 2017)¹⁸.

Observers

3.3.6 As outlined above, all vessels used by the Facility, during both the construction and operational phases, best practice is to have a non-dedicated MMOB on board, to keep watch for any harbour seal (or other marine mammal presence), within both The Haven and The Wash. A non-dedicated MMOB relates to a fully trained MMOB (by an JNCC accredited course), who may undertake other vessel duties while not required on watch (i.e. this can be a member of the vessel's crew). The MMOB duties would be the priority whenever it was required.

3.3.7 The MMOB would be positioned to ensure the best and uninterrupted view, if required for some vessels, the option for more than one MMOB will be considered. The MMOB should be equipped with binoculars, and in the case of any sighting, evaluate its location and heading against the location and heading of the vessel. Measures should be taken, if required, to avoid a collision with the individual.

3.3.8 The purpose of having a MMOB on board each vessel will be to watch ahead of the vessel, to ensure that no harbour seal (or other marine mammal) is at risk of collision with the vessel. If a harbour seal (or any other marine mammal) is sighted

¹³ https://www.seawatchfoundation.org.uk/wp-content/uploads/2021/04/Marine-Code-of-Conduct_website.pdf

¹⁴ <https://www.cornwallwildlifetrust.org.uk/sites/default/files/2019-03/Cornwall%20Marine%20and%20Coastal%20Code%20Guidelines.pdf>

¹⁵ <https://www.nature.scot/sites/default/files/2017-06/Publication%202017%20-%20The%20Scottish%20Marine%20Wildlife%20Watching%20Code%20SMWWC%20-%20Part%201%20-%20April%202017%20%28A2263518%29.pdf>

¹⁶ <https://www.nature.scot/sites/default/files/2017-06/Publication%202017%20-%20A%20Guide%20to%20Best%20Practice%20for%20Watching%20Marine%20Wildlife%20SMWWC%20-%20Part%202%20-%20April%202017%20%28A2263517%29.pdf>

¹⁷ <https://wnmp.co.uk/wp-content/uploads/sites/29/reports/2021/07/Wild-Recreation-Guide.pdf>

¹⁸ https://www.north-norfolk.gov.uk/media/2101/code_of_conduct_for_personal_water_craft_users.pdf

and considered to be at risk, the protocol is to maintain vessel speed and course (if possible) to allow the seal to move out of the way.

3.3.83.3.9 In addition, for vessels preparing to leave the anchorage area, the MMOB would be required to undertake a check of the area surrounding the vessel, to ensure there are no seals within close proximity to the vessel, particularly the propellers, prior to the vessel starting the engine for transit through the Haven.

3.3.93.3.10 Additional measures that could be taken, only in the case that it is observed that the individual is not vacating the area and is at risk of collision, include slowing down of the vessel. However, this should only be undertaken where the harbour seal (marine mammal) is at risk and not moving, and it is possible and safe to undertake these additional measures.

Vessel Speed and Direction

3.3.11 Subject to safety considerations, and directions from the Port of Boston Pilot and / or the vessel Master, vessels travelling to and from the Facility, would be required to follow at the current strict speed limit of 6 knots or less when within The Wash or The Haven. The Port of Boston relies on the Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREGS) safe speed, and in the case of large shipping, safe speed is set by the onboard pilot and is based on the prevailing circumstances, conditions and proximity of other vessels. The vessels associated with the Facility would therefore conform to current practice in The Haven, with a speed limit of 6 knots (unless this is not possible due to safety considerations, as advised by the statutory harbour authority or their representative on a vessel (i.e. the Pilot)).

3.3.12 A reduction in vessel speed is one of the key measures that can be put in place in order to reduce the risk of collision to marine mammal species.

3.3.13 There is a higher risk of collision to fatally injure marine mammals from vessels travelling at higher speeds, due to the increased level of impact (Wang *et al.*, 2007). This relationship between vessels speeds and lethality of collision is species dependant, as it is strongly related to body size.

3.3.14 As well as reducing the potential for lethal injury, a reduction in vessel speeds also reduces the number of collision events (Vanderlaan and Taggart *et al.*, 2007; Conn & Silber, 2013), as individuals are more likely to have the ability and time to move out of the way with vessels travelling at lower speeds (Hazel *et al.*, 2007; Gender *et al.*, 2011). Seals are very agile, giving them a good opportunity

to move out of the way, and therefore reducing the potential for collision with vessels.

3.3.15 Where there is a presence of vessels, the reduction in vessel speed is a preferred method for reducing collision risk, as stated by the International Whaling Commission (International Whaling Commission (IWC), 2014) and the International Maritime Organisation (IMO, 2016). It is also the only method that has been recommended for smaller marine mammal species. A study into the impact of ice-breaking vessels on phocid seals found that the predicted probability of collision was significantly increased with increasing vessel speed; at a speed of 4 knots or less, the potential for collision was very low, with the potential for collision increasing significantly from 6 knots or higher (Wilson *et al.*, 2017).

3.3.16 While the mitigation originally put forward to reduce the potential for collision risk was to reduce vessel speeds to 4 knots, further information has been received which means that this restriction would not be possible to undertake safely for all vessels at all times. This is due to the need for larger vessels to navigate at a speed of up to 6 knots in order to have sufficient engine power to navigate safely through The Wash and The Haven.

~~3.3.103.~~3.17 While it is not possible for some vessels to travel at a speed of as low as 4 knots (due to vessel manoeuvrability and safety concerns, as noted above), there is no indication that a further reduction to 4 knots would result in further reduction to that risk, as the evidence suggests that at any speed of below 6 knots, the potential for collision is significantly decreased.

~~3.3.113.~~3.18 Notwithstanding the need to ensure vessel safety, and the safety of other vessels, at all times the Best Practice measures relating to **speed and direction** are:

- Vessels will maintain a steady speed, and direction, at all times, to allow any marine mammal to predict where the vessel may be headed, and to move out of the way. Vessels should use the defined anchorage area and shipping channel at all times.
- ~~Avoid wherever possible (considering the vessels manoeuvrability) heading directly towards any harbour seal (or other marine mammals) that may either be in the sea, or hauled out on land. **Plate 4-1** shows the direction of approach that should be avoided.~~
- Within 300m of a marine mammal at sea, vessel should maintain speed and direction to ensure the individual can predict the vessel movements, and move out of the area if needed. ~~Vessels should avoid passing within 100m of a marine mammal (at sea) wherever possible (**Plate 4-1**).~~

- Vessels should not approach within 600m of known seal haul-out sites¹⁹.
- Extra care should be taken during the harbour seal pupping season of June to July (inclusive), and moult period of August.
- If a marine mammal chooses to approach the vessel (for example, to bow-ride) maintain the vessels speed and direction.

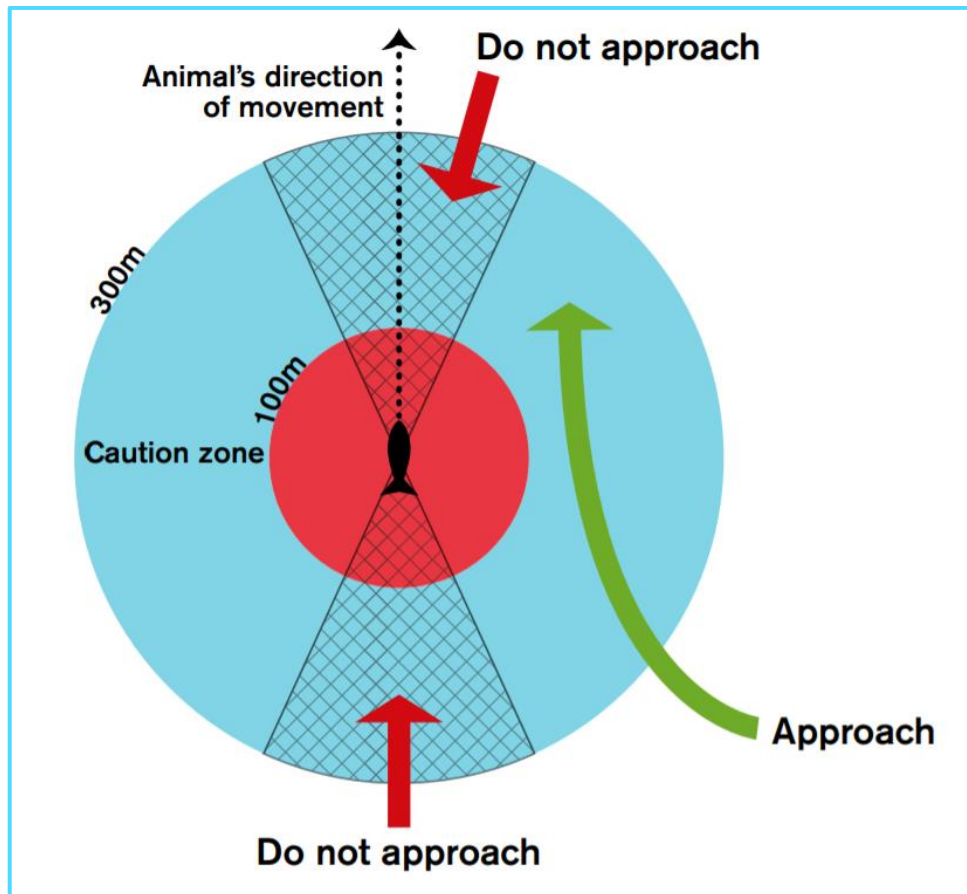


Plate 3-1 Direction of approach to any marine mammal to be avoided (taken from SNH, 2017b)

3.3.123.3.19 General measures that would be taken in order to reduce the risk of disturbance to marine mammals include:

- Keeping a well-maintained engine and propellor to minimise underwater noise.
- Turning off 'noisy' equipment when close to marine mammals (e.g. engines, propellers, echo sounders) if possible.

¹⁹ As most recently reported in the 2018 harbour seal haul-out site report: <https://wnnmp.co.uk/wp-content/uploads/sites/29/reports/2019/05/SMRU-The-Wash-Breeding-Season-Seal-Survey-Report-2018.pdf>

Reporting of Stranding's and Collisions

3.3.133.3.20 Any **stranding and / or collision event should be reported:**

- Any live strandings and / or non-fatal collisions (where the location of the individual is known) should be reported to British Divers Marine Life Rescue (BDMLR) (contact details are in **Box 3Box-3**).
- Any deceased strandings and / or fatal collisions should be reported to the Cetacean Stranding's Investigation Programme (CSIP) (contact details are in **Box 3Box-3**).

3.3.143.3.21 For any stranded or injured seal, MMOB should determine whether the individual is exhibiting normal behaviour, or whether it requires assistance. A seal may require assistance for one of the following reasons:

- Abandonment of juvenile seals
 - Juvenile grey seals have a white coat, and are born in November and December
 - Harbour seals are born in June and July
 - Monitor the seal periodically for as long as possible (for a period of at least 30 minutes, but preferably up to two hours) to determine whether there is a parent seal nearby
- Malnutrition
 - Signs of malnutrition include visible ribs, hips and neck. Sometimes the skin can be baggy and wrinkled in places
- Unwell – signs of ill health include
 - Coughing, sneezing or noisy, rapid breathing
 - Thick mucus coming from the nose, wounds or swellings
 - Favouring one flipper when moving
 - Cloudy eyes, or mucus around the eyes, or one eye kept closed
 - Seal showing little response to any disturbance (unless asleep)
- Entanglement in rope or gear

3.3.153.3.22 Any other marine mammal (dolphin, porpoise, or whale) that has stranded will require immediate assistance – do not attempt to help, call ~~British Divers Marine Life Rescue~~ (BDMLR) for specialist assistance, following the instructions in **Box 3Box-3**.

3.3.163.3.23 Photographs, and a record of any collision incidents, should be kept by the

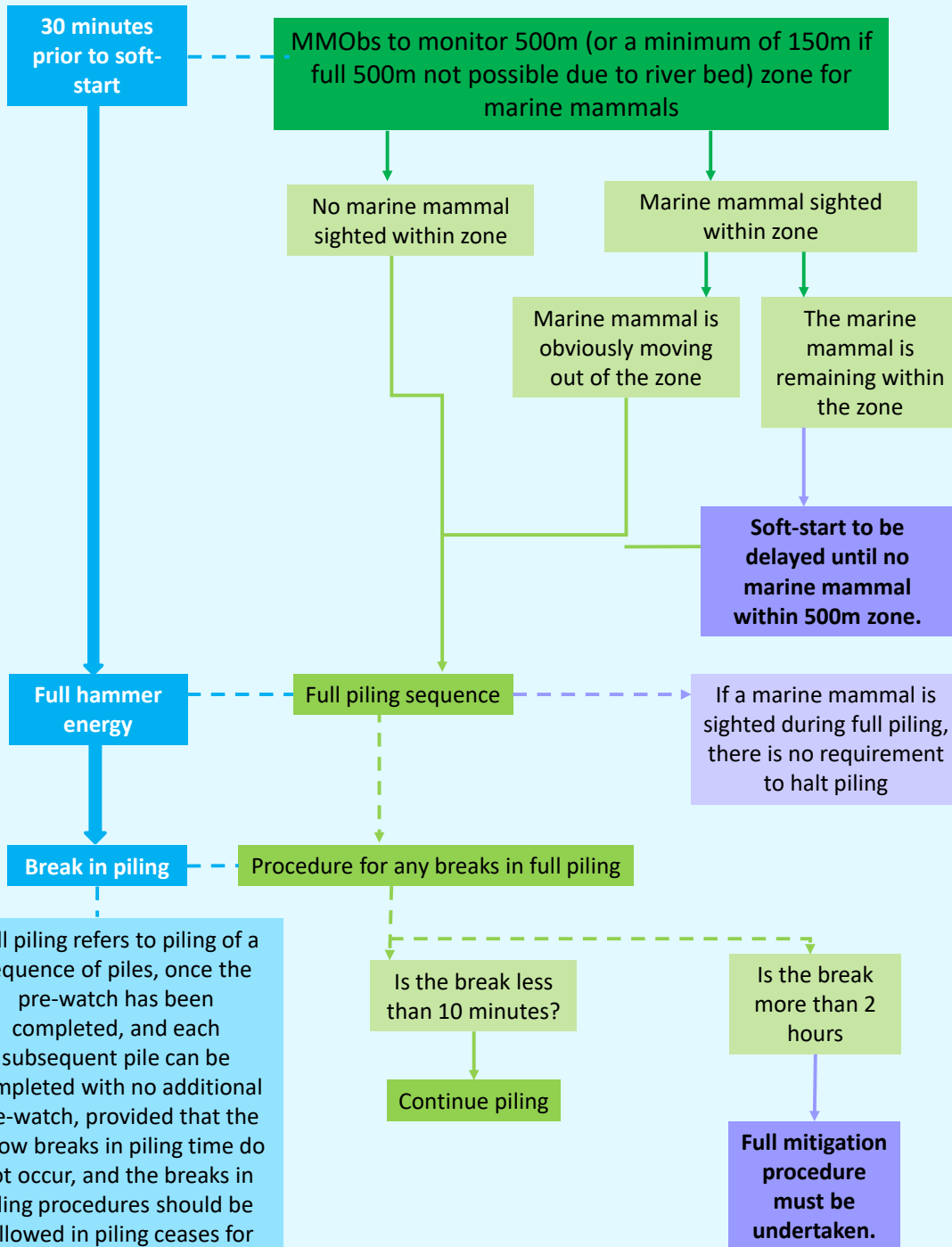
vessel crew for reporting to the relevant bodies. Box 4~~Box 4~~ provides a collision event form that should be used in the case that any collision occurs, and Box 5~~Box 5~~ provides a stranding form.

4 Mitigation Protocols

- 4.1.1 The mitigation protocol for piling is shown in Box 1~~Box 1~~.
- 4.1.2 The best practice measures for vessels travelling through and into The Wash and The Haven are shown in Box 2~~Box 2~~.
- 4.1.3 Details for the reporting of stranded or deceased marine mammals are in Box 3~~Box 3~~.
- 4.1.4 Reporting forms for any collision and / or stranding are in Box 4~~Box 4~~ and Box 5~~Box 5~~.

Box 1 Mitigation Protocol for Piling

Marine Mammal Mitigations for Piling (commencing within three hours of high water only)



Box 2 Best Practice Measures for Vessels

Mitigation Measures for Vessels during Construction and Operation – Page 1

MMObs

- All vessels to have non-dedicated MMOB on-board, watching primarily ahead of vessel to ensure no marine mammals at risk of collision
- MMOB to be on watch while vessel is transiting through The Wash and up The Haven
- MMOB to undertake a check for seals close to the vessel, prior to engines starting and transiting through the Haven
- If a marine mammal is sighted ahead of vessel
 - MMOB to evaluate individual/s location and heading to determine potential for being in route of vessel
 - Vessel to maintain speed and direction (if possible) to give time for individual to move out of the way
 - Evasive measures only required if collision with marine mammal will occur otherwise (and it is possible and safe to undertake), and include
 - ~~Change in vessel direction~~
 - Change in vessel speed (slow down)

General measures

- Keep engines and propellers well-maintained
- Turn off 'noisy' equipment when close to marine mammal/s (if possible)

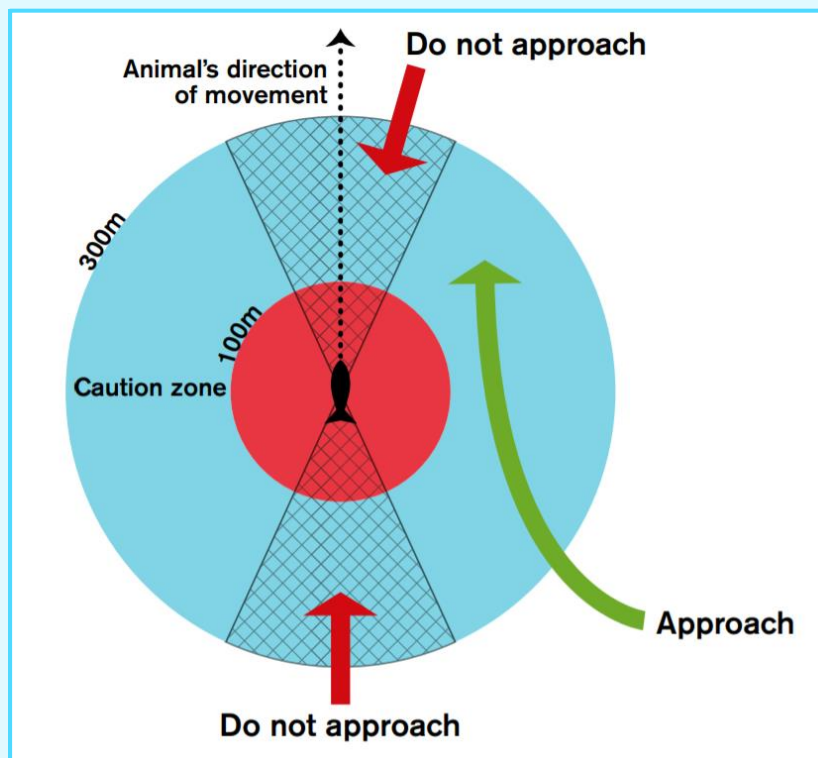
Mitigation Measures for Vessels during Construction and Operation – Page 2

Vessels in Transit through The Wash and The Haven

- Abide by vessel speed limits at all times (in line with vessel safety considerations as advised by the Port of Boston and their Pilots)

6 knots or less when within The Wash or The Haven

- Vessels to use defined anchorage area and shipping channel at all times
- Mitigation measures to be followed are below (wherever possible considering vessel manoeuvrability and any health and safety concerns)
 - Avoid being within 600m of a haul-out site
 - Vessels to maintain steady speed and direction
 - Extra care to be taken during harbour seal pupping season of June to August (inclusive)
 - If individual/s approach the vessel, maintain speed and direction
 - Avoid heading directly towards any marine mammal/s – follow guidelines in figure below



Box 3 Reporting of Marine Mammal Strandings

Reporting of Marine Mammal Strandings

Any live strandings and / or non-fatal collisions (where the location of the individual is known) should be reported to BDMLR

BDMLR Rescue Hotline	01825 765546 Monday-Friday (9am-5pm) 07787 433412 Out of office hours and Bank Holidays
RSPCA Hotline	0300 1234 999 24 hours

- **For seals**, follow this advice:
 1. Collect an accurate description of the seal
 2. Estimate the length of the animal and look for any distinguishing features
 3. Look for any signs of injury
 4. Provide information regarding location
 5. Avoid disturbance of the seal, do not scare it into the sea
 6. Do not touch the seal

- **For cetaceans** (dolphins, porpoises, whales), follow this advice:
 1. Avoid disturbance, excessive noise and too many observers
 2. Do not touch the cetacean and remain at a safe distance
 3. Estimate the length of the animal and look for any distinguishing features
 4. Look for any signs of injury
 5. If visible from a distance or via visual aids, count the number of breaths (opening of the blowhole) that occur over a minute
 6. Provide information regarding location
 7. Provide an accurate description of the animal, including its breathing rate, and whether it is in the surf, on rocks or sand, in the shade or in the full glare of the sun
 8. Provide information on weather conditions and sea state

Any deceased strandings and / or fatal collisions should be reported to the CSIP

CSIP Hotline	0800 652 0333
Further information	http://www.bdmlr.org.uk/uploads/documents/CSIP_leaflet.pdf

Box 4 Marine Mammal Collision Reporting Form

Marine Mammal Collision Reporting Form

If a vessel is involved in a collision with a marine mammal, details of the incident should be captured using the following form.

Contact Details for reporting - to be reported within 24 hours of incident

This form shall also be sent to the person in charge of the works, or the environmental liaison officer, as well as the regulator;

- Marine Management Organisation (MMO) – England
 - marine.consent@marinemangement.org

Form to be completed

Details of the incident (to be filled in by Vessel Master)

Vessel		Date & Time				
Approx. Location						
Vessel Activity						
Species Involved (if known) e.g. harbour porpoise; seal						
No. animals e.g. 1; small group; large group						
Outcome of the collision	<input type="checkbox"/> Near miss	<input type="checkbox"/> Minor injury	<input type="checkbox"/> Major injury	<input type="checkbox"/> Presumed dead	<input type="checkbox"/> Known dead	<input type="checkbox"/> Other
Photographic Evidence (if applicable)	<input type="checkbox"/> Yes (provided with form)		<input type="checkbox"/> Unable to capture following the incident			

Description of incident, and any further information:

Mitigating actions taken:

Box 5 Stranded or Deceased Marine Mammal Reporting Form

Stranded or Deceased Animal Reporting Form – Page 1

If a stranded or deceased marine mammal is found, details of the individual should be captured using the following form.

Contact details for reporting - to be reported within 24 hours of incident

This form shall also be sent to the person in charge of the works, or the environmental liaison officer, and kept on file for any later information requested from a regulator

Any live strandings should be reported to BDMLR to get help for the individual

BDMLR Rescue Hotline	01825 765546 Monday-Friday (9am-5pm) 07787 433412 Out of office hours and Bank Holidays
RSPCA Hotline	0300 1234 999 24 hours

Note that any deceased strandings and / or fatal collisions should be reported to CSIP

CSIP Hotline	0800 652 0333
Further information	http://www.bdmlr.org.uk/uploads/documents/CSIP_leaflet.pdf

Marine mammal stranding form can be found on next page.

Stranded or Deceased Animal Reporting Form – Page 2

Form to be completed

Details of the incident (to be filled in by Vessel Master)

Date		Time	
Reported by		Employer	
Location of deceased or stranded animal			
Weather conditions			
Animal	<input type="checkbox"/> Seal	<input type="checkbox"/> Cetacean	No animals:
Status	<input type="checkbox"/> Alive	<input type="checkbox"/> Dead (look for evidence of breathing, response to noise etc.)	
If alive, please give details of behaviour, body condition & trauma.			
<input type="checkbox"/> Active	<input type="checkbox"/> Still / quiet	<input type="checkbox"/> Coughing	<input type="checkbox"/> Sneezing
<input type="checkbox"/> Thin	<input type="checkbox"/> Plump	<input type="checkbox"/> Cloudy eyes	<input type="checkbox"/> Squinting
<input type="checkbox"/> Clear eyes	<input type="checkbox"/> Trauma	<input type="checkbox"/> Blood	<input type="checkbox"/> Entangled
<input type="checkbox"/> Other			
Further information:			
If dead, status of carcass	<input type="checkbox"/> Fresh	<input type="checkbox"/> Decomposing	
Photographic information provided	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Parties contacted (e.g. CSIP)			

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