



Brighter strategies
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Client: Cumberland Council

Project: Iron Line

Report: Ecological Impact Assessment and Preliminary Ecological Appraisal Update

QUALITY ASSURANCE

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1.0 EXECUTIVE SUMMARY

Greengage Environmental Limited (Greengage) was commissioned by Cumberland Council to update a previous Ecological Impact Assessment (EclA) and Preliminary Ecological Appraisal (PEA) Update to support a planning application at Hodbarrow Nature Reserve and a parcel of land immediately north of the nature reserve proposed for development as a Visitor Centre and car park, located on the south-west coast of Cumbria.

For the purpose of this report the 'planning application boundary' refers to the Hodbarrow Nature Reserve and land proposed for the proposed Visitor Centre and car park excluding the Hodbarrow lagoon, as shown in Appendix A Figure A.1.

The planning application for the site seeks “*Erection of visitor centre with café/shop, group room, staff/volunteer, toilet facilities and vehicle parking; consolidation, repair and installation of interpretive sculpture to Towsey Hole Windmill; refurbishment of existing Tern Island Hide; new bird hides, pathways, gateway features, street furniture, and demarcation of spaces at existing car park; enhancement of wildlife habitats; associated landscaping and drainage infrastructure; and maintenance of byway with restricted vehicular access -The Iron Line Project.*”

The existing site ecology has been at the forefront of considerations during the design stages with proposals seeking to retain the natural feel of Hodbarrow. The Proposed Visitor Centre and formalised paths will increase the accessibility of the site for all, and the aspirations of the project aim to increase the number of visitors from approximately 40,000 annually to 80,000.

The parcel of land immediately to the north of the reserve is proposed for the proposed Visitor Centre and car park and comprises hardstanding, mixed scrub, bramble (*Rubus fruticosus*) scrub and hawthorn (*Crataegus monogyna*) scrub, lowland meadow and lowland calcareous grassland. The wider Hodbarrow Nature Reserve (hereafter referred to as the "nature reserve") extends to 105 hectares (ha) and comprises lagoons, dunes, grasslands and scrubland. The nature reserve is a former iron mine and since 1986 has been owned and managed by the Royal Society for the Protection of Birds (RSPB).

For the purpose of this report the 'planning application boundary' refers to the nature reserve and land proposed for the proposed Visitor Centre and car park excluding the Hodbarrow lagoon, as shown in Appendix A Figure A.1. The planning application boundary extends to 57.91 ha.

The nature reserve is part of the Morecambe Bay and Duddon Estuary Special Protection Area (SPA), Morecambe Bay Special Area of Conservation (SAC) and Duddon Estuary Ramsar site (designated under the Convention on the Wetlands of International Importance especially as Waterfowl Habitat 1971 – the Ramsar Convention) and is itself a Site of Special Scientific Interest (SSSI). Despite its name, the nature reserve is not designated as a National Nature Reserve or Local Nature Reserve. The area proposed for the proposed Visitor Centre and car park is outside of the SPA, SAC, Ramsar and SSSI boundary (see Appendix A, Figure A.2).

The Morecambe Bay and Duddon Estuary is designated for the presence of internationally important coastal habitats which support internationally and nationally important assemblages of breeding, over-wintering and migratory birds. Other protected and notable species include great crested newts

(*Triturus cristatus*), natterjack toads (*Epidalea calamita*), nationally scarce plants including *Epipactis dunensis*, *Limonium humile*, *Centaurium littorale*, *Pyrola rotundifolia*, *Equisetum variegatum*, *Corallorhiza trifida*, *Coincya monensis* ssp. *monensis* and at least two British Red Data Book invertebrates *Colletes cunicularius*, *Psen littoralis*, *Hypocaccus rugiceps*.

This report should be read in conjunction with the shadow Habitat Regulations Assessment¹ and the shadow Appropriate Assessment².

To support a previous application for the site a PEA was undertaken by Appletons in 2021³ and 2022⁴. This report includes a PEA update (hereafter referred to as March 2025 PEA Update) undertaken by Greengage on the 25th and 26th March 2025. The aim to re-establish the presence of, or potential for, designated sites and legally protected/priority habitats and species at the site or within the zone of influence as identified within previous PEAs.

An understanding of the ecological baseline of the site and surroundings is required to fully understand the potential impacts of the proposed development on the site and the wider designations and the associated legal obligations.

This report is an assessment of the potential impacts and effects of the proposals to Visitor Centre and car park and the nature reserve and their associated habitats and species only. For the purposes of this report, the proposed Visitor Centre and car park have been assessed separately from the nature reserve.

The key ecological features associated with the site are summarised in the table below. Details of the landscaping measures will be incorporated into a long-term Landscape and Ecological Management Plan (LEMP). Construction phase mitigation actions will be incorporated into a Construction Ecological Management Plan (CEMP)⁵. The species-specific Mitigation Plans referenced below will be incorporated into these documents as appropriate.

As the site is subject to several national and international designations, in accordance with the Habitat and Species Regulations and National Planning Policy Framework (summarised in Appendix B) development proposals should be refused unless it can be established that significant harm to biodiversity can be avoided or adequately mitigated for. With this in mind, the development proposals have considered the qualifying features and general baseline ecology throughout the design process. The development seeks to secure the long-term conservation and enhancement of the habitats and species at site through a sustained commitment to management; the absence of which could risk some of the sensitive habitats due to successional habitat change .

Table 1.1 Mitigation and Residual Impact Summary

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Construction					
Designated Sites (SPA, SAC, Ramsar, SSSI)	Visitor Centre	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
	Nature reserve	Increased noise, visual activity and lighting disturbing the SPA and Ramsar qualifying breeding and overwintering birds .	Temporary to Permanent, Negative (Significant) Effect at an International Scale	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP⁵	Neutral Residual Effect
		Habitat degradation of SAC habitat Annex I H2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) through pollution events and trampling and spreading of invasive species by construction workers/machinery	Temporary to Permanent, Negative (Significant) Effect at an International Scale	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP⁵	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Annex I Habitats	Visitor Centre	Loss of 21m ² of regionally important Priority Lowland Meadow habitat	Permanent Negative (Significant) Effect at a Regional scale.	Compensatory lowland meadow planting through translocation and sowing seed mix	Permanent, Positive Residual Effect at a National scale (Significant)
		Pollution events, increased surface run-off, dust deposition, nitrogen deposition from machinery, trampling from construction workers resulting in degradation of habitat and spread of invasive species.	Temporary Negative (Significant) Effect at an International scale for Annex I habitats. Temporary Negative (Significant) Effect at a National scale for remaining priority habitats.	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP⁵	
		As a result of the proposals approximately 388m ² of hardstanding will be broken up and given back to nature which will increase the opportunity for sensitive habitats to expand.	Permanent, Positive (Significant) Effect at a Regional to National Scale.	n/a	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
	Nature reserve	Pollution events, increased surface run-off, dust deposition, nitrogen deposition from machinery, trampling from construction workers resulting in degradation of habitat and spread of invasive species.	Temporary Negative (Significant) Effect at an International scale for Annex I habitats Temporary Negative (Significant) Effect at an International scale for all other habitats	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP⁵.	Permanent, Positive Residual Effect ranging from between Local and International scale (Significant)
		n/a	n/a	- Narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling - restrict access to vehicles allowing habitats under existing unofficial car parks to recover.	
	Visitor Centre	Loss of notable plant species during the removal of lowland meadow habitat	Loss of fern grass (<i>Catapodium rigidum</i>) will result in a Permanent, Negative (Not Significant) Effect at a Regional scale	- Buffer zones around existing plants and retained areas - Compensatory planting through translocation and sowing seeds of the notable plants	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Notable Plants			The removal of carline thistle (<i>Carlina vulgaris</i>), wild strawberry (<i>Fragaria vesca</i>), quaking grass (<i>Briza media</i>) and eye bright (<i>Euphrasia officinalis</i>) the removal of these would result in a Permanent, Negative (Not Significant) Effect at a Local scale		Permanent, Positive Residual Effect at a National scale. (Significant)
		Disturbance through trampling, dust deposition, pollution events and additional runoff.	Temporary, Negative (Not Significant) Effect at a Local and Regional scale.	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP⁵	
		As a result of the proposals approximately 388 m ² of hardstanding will be broken up and given back to nature which will therefore expand the opportunities for these plants to grow	Permanent, Positive (Not Significant) Effect at a Local and Regional scale.	n/a	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
	Nature reserve	Disturbance through trampling, dust deposition, pollution events and additional runoff.	Negative (Significant) Effect at a Local, Regional and International scale.	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP⁵Error! Bookmark not defined.	Permanent, Positive Residual Effect at a Local to International scale (Significant)
		n/a	n/a	- Narrow and formalise the existing footpath - restrict access to vehicles allowing habitats under existing unofficial car parks to recover therefore expanding the opportunities for these plants to grow	
	Visitor Centre	Scrub clearance to facilitate the development of the building and car park. Killing and/of injury of common nesting birds and destruction of nests	Negative (Significant) Effect within the Zone of Influence only for common passerine birds	- Seasonal timing of clearance to avoid nesting bird (March-August, inclusive) - Or Suitably Qualified Ecologist confirms absence of nesting	Neutral Residual Effect
		Loss of scrub nesting habitat available due to the development.	Permanent, Negative (Not Significant) Effect within the Zone of Influence only	Enhancement and planting of scrub habitat across the nature reserve	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Breeding birds	Nature reserve	Indirect disturbance from increased noise, vibration and pollution events to the qualifying species, breeding tern and gull colonies and Schedule 1 species of birds.	Temporary, Negative (Significant) Effect at an International scale.	Seasonal timing of construction works (including vegetation clearance) in critical areas (e.g. along sea wall, near lagoon) to avoid nesting bird season (March-August, inclusive)	Neutral Residual Effect
Over Wintering Birds	Visitor Centre	Loss of scrub foraging and sheltering habitat for common passerine birds such as greenfinch (<i>Chloris chloris</i>), linnet (<i>Linaria cannabina</i>), dunnoek (<i>Prunella modularis</i>), bullfinch (<i>Pyrrhula pyrrhula</i>) and song thrush (<i>Turdus philomelos</i>)	Permanent, Negative (Not Significant) Effect within the Zone of Influence	n/a	Neutral Residual Effect.
	Nature reserve	Indirect disturbance to the qualifying species through a range of pathways including noise, vibration and pollutant spillage	Temporary, Negative (Significant) Effect at an International scale.	- Higher concentration of works take place outside sensitive season - Acoustic screens - ECoW presence for works during sensitive season	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Natterjack Toads	Visitor Centre	Potential risk for the killing or injuring of natterjack toads as a result of the construction activity on site.	Negative (Significant) Effect at the National scale.	- General best practice set out in section 7.7 - Amphibian Mitigation Plan within the CEMP and LEMP	Neutral Residual Effect
	Nature reserve	Potential risk for the killing or injuring of natterjack toads as a result of the construction activity on site.	Negative (Significant) Effect at the National scale.	- General best practice set out in section 7.7 - Amphibian Mitigation Plan within the CEMP and LEMP	Neutral Residual Effect
Reptiles	Visitor Centre	Potential risk for the killing or injuring of reptiles as a result of the construction activity on site.	Permanent, Negative (Significant) Effect within the Zone of Influence only.	- A specific Reptile Mitigation Plan will be produced which could be incorporated into the CEMP and LEMP as appropriate. - ECOW present during sensitive works	Neutral Residual Effect
	Nature reserve	Potential risk for the killing or injuring of reptiles as a result of the construction activity on site.	Permanent, Negative (Significant) Effect within the Zone of Influence only.	- General best practice set out in section 7.8 - Reptile Mitigation Plan within the CEMP and LEMP	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		n/a	n/a	- Narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling - restrict access to vehicles allowing habitats under existing unofficial car parks to recover and given back to nature which provides more opportunities for reptiles	
Invertebrates	Visitor Centre	Potential risk for the killing or injuring of invertebrates as a result of the construction activity on site.	Temporary, Negative (Not significant) Effect within the zone of influence only.	Habitat compensation through scrub enhancement and planting	Permanent, Positive Residual Effect at a Local to District scale (Significant)
		Approximately 388m ² of hardstanding will be broken up and given back to nature providing more opportunities for invertebrates	Permanent, (Significant) Effect at District scale.	n/a	
	Nature reserve	Habitat loss in the form of loss of scrub and lowland meadow	Temporary, Negative (Insignificant) Effect within the zone of influence only	Habitat lost will be compensated for and maintained as open habitats to benefit invertebrates	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		n/a	n/a	- Narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling. - Reduce current vehicular access/car parking to enable grassland areas to rejuvenate and provide invertebrate habitat	Permanent, Positive Residual Effect at a Local to District scale (Significant)
Amphibians	Visitor Centre	Potential risk for the killing and/or injury of amphibian species such as common toad (<i>Bufo bufo</i>), common frog (<i>Rana temporaria</i>), smooth newt (<i>Lissotriton vulgaris</i>) as a result of the construction activity on site	Negative (Significant) Effect within the Zone of Influence only.	- A specific Amphibian Mitigation Plan will be produced which could be incorporated into the CEMP and LEMP as appropriate. - ECOW present during sensitive works	Neutral Residual Effect
	Nature reserve	Potential risk for the killing and/or injury of amphibian species such as common toad, common frog, smooth newt as a result of the construction activity on site	Negative (Significant) Effect within the Zone of Influence only.	- A specific Amphibian Mitigation Plan will be produced which could be incorporated into the CEMP and LEMP as appropriate. - ECOW present during sensitive works	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Bats	Visitor Centre	Scrub clearance may reveal trees and trees with roosting features in trees within areas of currently dense scrub. The clearance of trees with roosting features could result in the killing and injury of bats, and loss of roosts/potential roosts	Negative (Significant) Effect at the Local scale.	- Clearance done with presence of ECoW - Any bat features be identified then works will cease and the SQE will carry out a bat endoscopy survey - CEMP to include daylight working hours and measures to avoid light spill if necessary	Neutral Residual Effect
	Nature reserve	Scrub clearance may reveal trees and trees with roosting features in trees within areas of currently dense scrub. The clearance of trees with roosting features could result in the killing and injury of bats, and loss of roosts/potential roosts	Negative (Significant) Effect at the Local scale.	- Clearance done with presence of ECoW - Any bat features be identified then works will cease and the SQE will carry out a bat endoscopy survey - CEMP to include daylight working hours and measures to avoid light spill if necessary	Neutral Residual Effect
	Visitor Centre	Presence of a sett in the dense scrub cannot be entirely ruled out. Scrub clearance and excavation works therefore have	Negative (Significant) Effect at the Local scale.	Clearance done with presence of ECoW. Works will be stopped if any potential badger setts found and monitoring will be undertaken	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Badgers (Meles meles)		the potential to result in destruction of setts/harm to badgers		to determine any licence requirements	
	Nature reserve	Presence of a sett in the dense scrub cannot be entirely ruled out. Scrub clearance and excavation works therefore have the potential to result in destruction of setts/harm to badgers	Negative (Significant) Effect at the Local scale.	Clearance done with presence of ECoW. Works will be stopped if any potential badger holes found and monitoring will be undertaken	Neutral Residual Effect
		Lighting, construction noise/ vibration activities, storage of chemicals, felling of trees and creation of trenches/ excavations with potential for disturbance, injury and killing of foraging/commuting badgers.	Temporary, Negative (Not Significant) Effect within the Zone of Influence only.	- CEMP to include daylight working hours and measures to avoid light spill if necessary - Trenching and excavations to be covered each night	
		n/a	n/a	Narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				Restrict access to vehicles allowing habitats under existing unofficial car parks to recover and given back to nature which provides more opportunities foraging opportunities for badgers	
Riparian Mammals	Visitor Centre	During scrub clearance, otters or otter holts could be identified which could result in killing, injury, or disturbance of otters and damage or destroy their breeding sites and resting places	Negative (Significant) Effect at a Local scale.	Scrub clearance done with presence of ECoW. Works will be stopped if any signs of riparian mammals detected and monitoring will be undertaken	Neutral Residual Effect
		Lighting, construction noise/ vibration activities, storage of chemicals, felling of trees and creation of trenches/ excavations with potential for disturbance, injury and killing of otters	Temporary, Negative (Significant) Effect at a Local scale.	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP¹	
	Nature reserve	During scrub clearance, otters or otter holts could be identified which could result in killing, injury, or disturbance of otters and	Negative (Significant) Effect at a Local scale.	Scrub clearance done with presence of ECoW. Works will be stopped if any signs of riparian	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		damage or destroy their breeding sites and resting places		mammals detected and monitoring will be undertaken	
		Lighting, construction noise/ vibration activities, storage of chemicals, felling of trees and creation of trenches/ excavations with potential for disturbance, injury and killing of otters	Temporary, Negative (Significant) Effect at a Local scale.	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEM Error! Bookmark not defined.	
Hedgehog	Visitor Centre	Clearance of scrub may lead to the killing or injuring of hedgehog	Negative (Significant) Effect within the Zone of Influence only.	- Scrub vegetation will be cleared in a phased manner - In the event that hedgehogs are found, the ECoW will remove them and place them in suitable habitat that is earmarked for retention	Neutral Residual Effect
	Nature reserve	Clearance of scrub may lead to the killing or injuring of hedgehog	Negative (Significant) Effect within the Zone of Influence only.	- Any scrub vegetation will be cleared in a phased manner - Clearance done with presence of ECoW	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				In the event that hedgehogs are found, the ECoW will remove them and place them in suitable habitat that is earmarked for retention	
Operational					
Designated Sites (SPA, SAC, Ramsar, SSSI)	Visitor Centre	Increased runoff and foul water onto site	Permanent, Negative (Significant) Effect at an International scale	- All surface water drainage from car park and building will firstly go into attenuation/treatment tanks under the car park and coach park area and then will be discharged into the old Red Hills quarry off-site to the north - Foul water will be pumped off-site into the existing United Utilities drain	Neutral Residual Effect
	Nature reserve	Recreational pressure in the form of human disturbance to qualifying species	Permanent, Negative (Significant) Effect at an International scale	- Fortify and extend the existing bund along the sea wall BOAT - Restrict vehicular access along the BOAT to emergency and maintenance vehicles only and as	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				such reduce opportunities for anti-social driving along the BOAT • Reduce access for kayakers and paddle boarders • Provision of signs raising awareness and informing on the importance and rarity of plants • Continued presence of tern warden • Additional island creation for nesting	
		Recreational pressure causing degradation to qualifying habitats through activities such as additional footfall, littering and invasive species introduction, increase in fly tipping.	Permanent, Negative (Significant) Effect at an International scale	• Formalising paths to discourage visitors from trampling sensitive habitats • Provision of signs informing visitors on the importance and rarity of the habitats present • Provision of dog waste bins and litter bins • On-going management and monitoring for 30 year period	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				with remedial actions to include removal of invasive plant species	
Habitats	Visitor Centre	Recreational pressure from increased human presence / activities could result in habitat degradation through trampling from footfall, introduction of invasive species, increase in fly tipping.	Permanent, Negative (Significant) Effect at a National to International scale.	- Provision of signs informing visitors on the importance and rarity of habitats - Scrub buffer planting around car parks and access drives - Provision of dog waste bins and litter bins - On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species	Neutral Residual Effect
		Increase in eutrophication of the retained Annex I and priority habitat through dog faeces and reactive nitrogen deposition from cars parking	Permanent, Negative (Not Significant) Effect at a National to International scale.	- Scrub buffer planting around car parks and access drives - Provision of dog waste bins	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		n/a	n/a	The proposals will bring long-term management to the site for a period of at least 30 years	
	Nature reserve		Permanent, Positive (Significant) Effect at a Regional, National and International scale.	- Narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling - Restrict access to vehicles allowing habitats under existing unofficial car parks to recover therefore expanding the opportunities for habitats to expand	Permanent, Positive Residual Effect ranging from between Local and International scale (Significant).
		Habitat degradation through trampling from footfall, introduction of invasive species, increase in fly tipping and increase in eutrophication through dog faeces..	Permanent Negative (Significant) Effect at an International scale. Impacts to the remaining priority habitats on site would result in a Permanent Negative (Significant) Effect at a National scale.	- Narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling - Provision of signs informing on the importance and rarity of habitats - Provision of dog waste bins and litter bins	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species	
		The proposals will bring long-term management to the site for a period of at least 30 years.	Permanent, Positive (Significant) Effect at a Regional, National, and International scale.	n/a	
Notable Plants	Visitor Centre	Disturbance and killing of notable plants on site through trampling from footfall, introduction of invasive species outcompeting for resources, increase in eutrophication through dog faeces and reactive nitrogen deposition from cars parking.	Permanent Negative (Significant) Effect at a Local and Regional scale.	- Narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling - Provision of signs informing on the importance and rarity of plants. - Provision of dog waste bins and litter bins - On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species.	Neutral Residual Effect.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		n/a	n/a	The proposals will bring long-term management for a period of at least 30 years.	
	Nature reserve	Recreational pressure resulting in habitat degradation on the habitats on site through trampling from footfall, introduction of invasive species, increase in fly tipping and increase in eutrophication through dog faeces.	Permanent Negative (Significant) Effect at a Local, National and International scale.	- Formalising paths to discourage visitors from trampling sensitive habitats. - Provision of signs raising awareness and informing on the importance and rarity of plants. - Provision of dog waste bins and litter bins. - On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species.	Permanent, Positive Residual Effect on notable plant communities ranging from between Local and International scale.
		n/a	n/a	Long-term management to the site for a period of at least 30 years.	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Breeding bird	Visitor Centre	None.	Negligible (Not Significant)	n/a	Neutral Residual Effect.
	Nature reserve	Proposals estimate peaks of 50 visitors per hour over the course of a day during peak periods (school holidays, warm weather). The increase in visitors has potential to increase the frequency of human disturbance to breeding terns and gulls. Increase in visitors could increase existing antisocial behaviour along the BOAT such as racing causing noise and visual disturbance and fly tipping into lagoon	Permanent Negative (Significant) Effect at an International scale.	- Fortify and extend the existing bund along the sea wall BOAT to prevent access to lagoon edge and screen visitors from birds using the lagoon. - Restrict vehicular access along the BOAT to emergency and maintenance vehicles only to reduce the overall vehicular traffic and opportunities for anti-social activities along the BOAT. - Reduce access for kayakers and paddle boarders to the lagoon . - Provision of signs raising awareness and informing on the importance of the breeding bird colonies. - Continued presence of tern warden.	Neutral Residual Effect.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Overwintering birds	Visitor Centre	None.	Negligible (Not Significant).	n/a	Neutral Residual Effect.
	Nature reserve	The site is already subject to some disturbance from site users however the proposals will seek to increase visitors which is predicted to equate to 219 people each day if spread evenly across the year. Increase in visitors could increase existing antisocial behaviour along the BOAT such as racing causing noise and visual disturbance and fly tipping into lagoon	Permanent Negative (Significant) Effect at an International scale.	- Fortify and extend the existing bund along the sea wall BOAT - Restrict vehicular access along the BOAT to emergency and maintenance vehicles only and as such reduce opportunities for anti-social activities along the BOAT. - Reduce access for kayakers and paddle boarders to the lagoon. - Provision of signs raising awareness and informing on the importance of the overwintering bird assemblages.	Neutral Residual Effect.
	Visitor Centre	None.	Negligible (Not Significant).	n/a	Neutral Residual Effect.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Natterjack toad	Nature reserve	Increased disturbance and harm from people and dogs.	Permanent Negative (Not Significant) Effect at a National scale.	• Monitor fencing around pools and repair when necessary • Restrict vehicular access along the BOAT to emergency and maintenance vehicles only and as such reduces chances of natterjacks being runover • Formalisation of paths • Signage will be also used to provide information about their ecology, identification tips and give a deeper understanding of natterjack toads. • Increased refugia across the site.	Neutral Residual Effect.
Reptiles	Visitor Centre	Increased disturbance and harm from people and dogs to reptiles present in habitat onsite and in the near surrounds (Zone of Influence).	Permanent Negative (Not Significant) Effect at a Local scale.	• Formalising paths to discourage visitors from trampling on surrounding suitable reptile habitat • Signage will be also used to provide information about their ecology, identification tips and give a deeper understanding of the reptiles present.	Neutral Residual Effect.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				Increased refugia across the site in locations where walkers and dogs will be discouraged.	
	Nature reserve	Increased disturbance and harm from people and dogs.	Permanent Negative (Not Significant) Effect at a Local scale.	- Formalising paths to discourage visitors from trampling surrounding suitable reptile habitat - Signage will be also used to provide information about their ecology, identification tips and give a deeper understanding of the reptiles present. - Increased refugia across the site.	Neutral Residual Effect.
Invertebrates	Visitor Centre	n/a	n/a	The development ensures the long-term management commitment to habitats that would otherwise scrub over and result in a homogenous habitat	Permanent, Positive effect at District Level (Significant).
	Nature reserve	n/a	n/a	The development ensures the long-term management commitment to habitats that	Permanent, Positive effect at District Level (Significant).

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				would otherwise scrub over and result in a homogenous habitat	
Amphibians	Visitor Centre	Increased disturbance and harm from people and dogs	Permanent Negative (Not Significant) Effect at a Local scale.	- Formalising paths to discourage visitors from trampling surrounding suitable amphibian habitat - Signage will be also used to provide information about amphibian ecology, identification guides - New refugia across the site to offer an increase in habitat	Neutral Residual Effect.
	Nature reserve	Increased disturbance and harm from people and dogs	Permanent Negative (Not Significant) Effect at a Local scale.	- Monitor fencing around pools and repair when necessary - Formalising paths to discourage visitors from trampling surrounding suitable amphibian habitat - Signage will be also used to provide information about	Neutral Residual Effect.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				amphibian ecology, identification guides New refugia across the site to offer an increase in habitat	
Bats	Visitor Centre	Lighting scheme with increased, uncontrolled upward light spill, disturbing, reducing or excluding foraging or commuting bats from lit areas.	Permanent Negative (Insignificant) Effects at a Local scale.	A bat sensitive lighting strategy will be in place subject to curfews and motion sensors.	Neutral Residual Effect.
	Nature reserve	None	Negligible (Not Significant).	n/a	Neutral Residual Effect.
Badgers	Visitor Centre	Increased disturbance from increased numbers of visitors and dogs	Negligible (Not Significant).	Formalising paths to discourage visitors from trampling surrounding suitable badger habitat	Neutral Residual Effect.
	Nature reserve	None	Negligible (Not Significant).	n/a	Neutral Residual Effect.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Riparian Mammals	Visitor Centre	None	Negligible (Not Significant).	n/a	Neutral Residual Effect.
	Nature reserve	Increased disturbance from increased numbers of visitors and dogs	Permanent, Negative (Not Significant) Effect at a Local scale.	- Enhancement of scrub habitat on the lagoon edge leaving opportunities for otters to shelter. - Restricted access of cars along BOAT - Fortify and extend the existing bund along the sea wall BOAT	Neutral Residual Effect.
Hedgehog	Visitor Centre	None	Negligible (Not Significant).	n/a	Neutral Residual Effect.
	Nature reserve	None	Negligible (Not Significant).	n/a	Neutral Residual Effect.

2.0 INTRODUCTION

Greengage Environmental Limited (Greengage) was commissioned by Cumberland Council to update a previous Ecological Impact Assessment (EclA) and Preliminary Ecological Appraisal (PEA) Update to support a planning application at Hodbarrow Nature Reserve and a parcel of land immediately north of the nature reserve proposed for development as a Visitor Centre and car park, located on the south-west coast of Cumbria.

For the purpose of this report the 'planning application boundary' refers to the Hodbarrow Nature Reserve and land proposed for the proposed Visitor Centre and car park excluding the Hodbarrow lagoon, as shown in Appendix A Figure A.1.

The planning application for the site seeks *“Erection of visitor centre with café/shop, group room, staff/volunteer, toilet facilities and vehicle parking; consolidation, repair and installation of interpretive sculpture to Towsey Hole Windmill; refurbishment of existing Tern Island Hide; new bird hides, pathways, gateway features, street furniture, and demarcation of spaces at existing car park; enhancement of wildlife habitats; associated landscaping and drainage infrastructure; and maintenance of byway with restricted vehicular access -The Iron Line Project.”*

This report incorporates the historical environmental records from RSPB data for breeding and overwintering birds up until 2024 and the findings of RSPB's 2024 natterjack toad presence/likely absence surveys and a suite of Phase II ecology surveys completed between 2021 and 2022. This review of records and survey information aims to establish the ecological value of this site and the presence/likely-absence of notable and/or legally protected species in order to inform appropriate mitigation, compensation and enhancement actions in light of proposed development works. The site has been subject to multiple surveys over the last 10 years and therefore historical data have also been reviewed and presented where relevant.

An updated PEA (hereafter referred to as March 2025 PEA Update) was undertaken by Greengage on the 25th and 26th March 2025. The March 2025 PEA Update was undertaken in accordance with guidance in the UK Habitat Classification System (UKHab)⁶ and CIEEM (2017) Guidelines for Preliminary Ecological Appraisal⁷, in accordance with BS42020:2013: Biodiversity⁸. The aim to re-establish the presence of, or potential for, designated sites and legally protected/priority habitats and species at the site or within the zone of influence as identified within previous PEAs.

This report assesses the ecological impacts of the proposed development following the approach set out in the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment⁹. The report assesses whether important ecological features will be subject to impacts and characterisation of these impacts and their effects. Assessment of the significance of the residual ecological effects of the project (those remaining after mitigation), including cumulative effects.

2.1 SITE DESCRIPTION

The planning application boundary extends to approximately 57.91 hectares (ha) and is centred on National Grid Reference SD 17718 78724, OS Co-ordinates 317718, 478724.

The site is located on the edge of the Duddon Estuary in south-west Cumbria. The site encompasses the Hodbarrow Nature Reserve (hereafter referred to as the 'nature reserve') which extends to 105 ha in total and comprises lagoons, dunes, grasslands and scrubland. However, the Hodbarrow lagoon falls outside the planning application boundary as the development is on terrestrial habitats only. The nature reserve is part of the Duddon Estuary Site of Special Scientific Interest (SSSI) and Morecambe Bay and Duddon Estuary Special Protection Area (SPA), Special Area of Conservation (SAC) and Ramsar site.

The location for the proposed Visitor Centre is sited on a pocket of land encompassing approximately 2.1 ha to the north of the nature reserve which comprises dense scrub, calcareous grassland and an access road which leads to a Household Waste Recycling Centre off-site to the north.

The nature reserve was once the site of a former iron mine which opened in the early 1860's and closed in 1968. The majority of buildings associated with the mine have been removed however the reserve is scattered with remnant build structures from the mine in the forms of old stone walls, quarries, lighthouses, beacons and the partial remains of an unsuccessful sea wall. In 1905 a successful attempt at a large tidal breakwater was built to protect the ironworks from the sea and still stands today. Following the mines' closure the area behind the seawall was flooded and formed a, now freshwater, lagoon which supports large populations of wintering and breeding wildfowl and waders. The RSPB purchased the nature reserve in 1986 and their management practices include scrub clearance and the creation of limestone slag islands within the lagoon which have successfully encouraged and sustained breeding populations of little terns (*Sternula albifrons*), common terns (*Sterna hirundo*) and sandwich terns (*Thalasseus sandvicensis*). The populations of breeding terns and wintering wildfowl using Hodbarrow lagoon contribute to the wider designation of Duddon Estuary and Morcambe Bay SPA and Duddon Estuary Ramsar Site.

The nature reserve is part of a popular 3-mile circular walk which takes visitors on paths through the dense willow and bramble scrub, through calcareous grasslands, past the sand dunes and along the sea wall looking out over the lagoon to the north and the Irish sea to the south. The sea wall loops across to a caravan park 0.3km east of Haverigg. The mosaic of habitats on-site support rich and diverse plant communities and assemblages of invertebrates.

2.2 DEVELOPMENT PROPOSALS

This document has been produced to inform a planning application for the site which seeks “*Erection of visitor centre with café/shop, group room, staff/volunteer, toilet facilities and vehicle parking; consolidation, repair and installation of interpretive sculpture to Towsey Hole Windmill; refurbishment of existing Tern Island Hide; new bird hides, pathways, gateway features, street furniture, and demarcation of spaces at existing car park; enhancement of wildlife habitats; associated landscaping and drainage infrastructure; and maintenance of byway with restricted vehicular access -The Iron Line Project.*”

The development seeks to secure the long-term conservation and enhancement of the habitats and species at site through a sustained commitment to management; the absence of which could create risks for some of the sensitive habitats due to successional habitat change or continued degradation from trampling caused by site visitors.

For the purposes of this report the site has been split into the area proposed for the proposed Visitor Centre and car park and the nature reserve. Despite not being within the planning application boundary, species using the Hodbarrow lagoon have been considered within this EclA and PEA Update.

Consideration of the proposals has been separated into:

- Development of a Visitor Centre and car park site, which will involve:
 - Clearance of existing dense scrub habitat and 21m² of Priority Lowland Meadow habitat to facilitate the development;
 - Retention and protection of the remaining lowland meadow and calcareous grassland;
 - Development of a Visitor Centre which will comprise a two-story building, the ground floor will include a café, a shop, toilets, staff room. The top floor will give a 360° view of the surrounding landscape.;
 - The development of an access road for a car park with a total of 63 car parking spaces;
 - An area of 338m² of existing hardstanding layby will be used for new grassland creation including compensation for the loss of priority lowland meadow.
- Improvements across the nature reserve, which include:
 - The restriction of vehicular access along the BOAT to emergency and maintenance vehicles only and therefore the habitats currently used as unofficial car parks can recover and natural habitats can expand.
 - Formalise desire lines to be retained through fencing off/or laying with a natural, permeable surface;
 - Discouraging use of some existing desire lines which are not beneficial for sensitive habitats;
 - Habitat restoration/creation will be available through the formalising paths and allowing surrounding habitats currently subject to high footfall to recover;
 - Consolidation, repair to Towsey Hole Windmill;
 - Installation of art and education features across the site;
 - Improvements to the existing tern island hide and reinforcement of bunding along sea wall; and
 - The building of three hides; one overlooking the 'hidden lagoon' one overlooking the old quarry lagoon and the third adjacent to the old sea wall overlooking Hodbarrow Lagoon.

2.3 DESIGN PROCESS

Greengage have liaised with the design team on a weekly basis and engaged with the Council, Natural England and RSPB throughout the design process to support the previous planning application. Greengage have communicated the ecological constraints and opportunities to the design team which has been informed by the Phase II survey results. The designs have been adapted throughout the process as and when any new relevant ecological constraints were identified. The proposals for the updated planning application have followed the same principals as the earlier application and RSPB and Natural England have been kept up to date. The development process has followed the mitigation hierarchy throughout the design stage:

- Avoidance- Seek options that avoid harm to ecological features (for example, by locating on an alternative site).
- Mitigation- Negative effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.
- Compensation- Where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.
- Enhancement- Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

2.4 AVOIDANCE MEASURES

A number of impacts have been avoided through design, and therefore do not form part of the overall impact assessment. The avoided impacts are set out here and will not be referred to again.

First and foremost the development has sought to avoid harm to ecological features. The area of the proposed Visitor Centre and car park has been selected as it is currently comprised of common and widespread dense scrub habitat. This area was selected as it sits outside the boundary for the SAC, SPA, Ramsar and SSSI designations. An area of car parking has been moved to avoid Annex I habitat, in light of the 2022 National Vegetation Classification (NVC) survey.

Plans for a new hide which would involve clearing a large strip of scrub were reconsidered in favour of a location that does not require as much clearance.

The paths set to be formalised have been selected by using existing desire lines which are already subject to human disturbance through heavy footfall. The paths require formalisation to ensure the site is accessible to all and through this formalisation, the paths will be narrowed. This avoids disturbing habitats to create accessible pathways.

2.5 ECOLOGICAL CONTEXT

Two Preliminary Ecological Appraisals (PEA) were produced by Appletons in 2021 and 2022. Site visits were undertaken throughout May and August 2021 which informed the Preliminary Ecological

Appraisal (PEA)³ of Hodbarrow Nature Reserve, in addition to a desk study of local records of protected/notable species obtained from the RSPB (for the reserve) and from Cumbria Biodiversity Data Centre (for a radius of 2km around the reserve). A PEA was undertaken in January 2022 to understand the ecological baseline of the area of the proposed Visitor Centre and car park site⁴. The entire sites were surveyed where accessible with particular focus on the areas that have potential to be impacted by the proposals.

During the PEA, surveyors searched for field signs indicating the presence of protected/notable species and for habitat with the potential to support protected/notable species, including badgers (*Meles meles*), reptiles, bats, nesting birds, amphibians, otters (*Lutra lutra*), etc. These searches were undertaken during daytime survey visits to record the botanical species and broad habitats present. Hereafter these PEA's are referred to as 2021/2022 PEA.

Phase II survey results

Following a review of development proposals, historical survey data and the phase II survey results, the following ecological features have the potential to be affected by the proposals and these are therefore the focus of the EclA:

- Designated sites:
 - The nature reserve falls within the designated site boundaries of Morecambe Bay and Duddon Estuary SPA, SAC, Ramsar and SSSI and the proposed Visitor Centre development and car park footprint falls immediately outside this boundary to the north-east;
- Habitats:
 - Both the proposed Visitor Centre area and the nature reserve have semi-natural dry grasslands and scrubland facies on calcareous substrates (H6210);
 - The nature reserve supports Annex 1 H2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)-which is listed as one of the qualifying features for the SAC designation; and
 - Several nationally, regionally and locally important habitats on site.
- Notable plants:
 - The habitats present support several internationally, nationally, regionally and locally important plants on site including Irish dandelion (*Taraxacum aesculosum*) and pillwort (*Pilularia globulifera*).
- Invasive Species
 - There are a number of invasive species on the main reserve and on the proposed Visitor Centre/car park site, including cotoneaster spp, variegated yellow archangel (*Lamiastrum galeobdolon* subsp), Montbretia sp., Japanese knotweed (*Reynoutria japonica*) and sea buckthorn (*Hippophae rhamnoides*).
- Breeding birds:

- Hodbarrow reserve supports important breeding bird assemblages such as the breeding colonies of common terns (*Sterna hirundo*), Sandwich terns (*Thalasseus sandvicensis*), little terns (*Sternula albifrons*); and
- Hodbarrow reserve also supports important over-wintering and migratory bird assemblages including include overwintering redshank (*Tringa totanus*), knot (*Calidris canutus*) and passage black tailed godwit (*Limosa limosa*);
- Both the nature reserve and the adjacent Visitor Centre site will support a variety of nesting birds during spring/summer in the scrub and trees and on waterbodies.
- Amphibians:
 - A confirmed natterjack toad (*Epidalea calamita*) breeding pond lies approximately 0.57km north-east of the proposed works along the BOAT on the main reserve;
 - The ponds on-site support smooth newt (*Lissotriton vulgaris*), common toad (*Bufo bufo*) and common frog (*Rana temporaria*).
- Reptiles:
 - Good populations of common lizard have been recorded in both the area proposed for the proposed Visitor Centre and in habitats surveyed on the nature reserve.
 - One slow-worm was recorded within the nature reserve
- Invertebrates:
 - The proposed Visitor Centre and car park site supports at least 86 terrestrial invertebrate species, three of which are notable; and
 - The proposed Visitor Centre and associated car parking area has district (low) importance for invertebrates.
 - The habitats along the paths across some of the nature reserve support at least 159 species of terrestrial invertebrates; 26 species (~16%) are regarded as locally common or locally scarce, three (~2%) are currently accorded Nationally Scarce or Section 41 status and one is classed as data deficient.
 - The habitats either side of the main paths of the reserve have district (low) importance for invertebrates

3.0 METHODOLOGY

The methodologies of the different surveys and assessments undertaken in support of this EclA and PEA Update are set out below.

3.1 PRELIMINARY ECOLOGICAL APPRAISAL

A March 2025 PEA Update was undertaken by Greengage on the 25th and 26th March 2025. The March 2025 PEA Update was undertaken in accordance with guidance in the UK Habitat Classification System (UKHab)⁶ and CIEEM (2017) Guidelines for Preliminary Ecological Appraisal⁷, in accordance with BS42020:2013: Biodiversity⁸.

Features within the site boundary and accessible features immediately bordering it were evaluated, and the extent and distribution of habitats and plant communities were recorded and supplemented with target notes on areas or species requiring further commentary. Fauna using the area were recorded and areas of habitat suitable for statutorily protected species were identified where present, with an active search carried out for evidence of such use.

The March 2025 PEA Update involved a site walkover carried out with the aim to re-establish the presence of, or potential for, designated sites and legally protected/priority habitats and species at the site or within the zone of influence as identified within the above-mentioned pre-existing PEA. A full PEA Update was not undertaken as Greengage have regularly attended the site since the 2023 planning submission, for Ecological Clerk of Works (ECoW), and have knowledge that site conditions have remained similar.

During the site walkover, the surveyor searched for field signs indicating the presence of protected/notable species and for habitat with the potential to support protected/notable species, including badgers (*Meles meles*), reptiles, bats, nesting birds, amphibians, otters (*Lutra lutra*), etc. These searches were undertaken during daytime survey visits to record the botanical species and broad habitats present. This report includes only the changes identified since the pre-existing PEA.

3.2 ECOLOGICAL IMPACT ASSESSMENT

The EclA Update was undertaken in line with guidance in the Chartered Institute of Ecological and Environmental Management (CIEEM) (2024) Guidelines for Ecological Impact Assessment⁹ and in accordance with BS42020:2013: Biodiversity.

Criteria for Assessing Conservation Value of Ecology Receptors

The approach to ecological evaluation advocated by the CIEEM guidelines involves professional judgement, based on available guidance and information, together with advice from experts who know the locality of the project and / or the distribution and status of the species or features that are being considered. The analysis aims to assign value to an ecological feature with reference to a defined geographical scale, i.e.:

- International;
- National;
- Regional;
- Metropolitan/District;
- Local.

Sites which are subject to statutory and/or non-statutory designation may be readily assigned a value on this scale, for example:

- Special Areas of Conservation (SACs) and SPAs are internationally important sites;
- Sites of Special Scientific Interest (SSSI) are nationally important sites; and
- Cumbria County Wildlife Sites (non-statutory) are of District value in Cumbria.

Where an area has more than one designation, the highest of these has been used to assign significance. Features of a site that are not the reasons for its designation(s) are assessed and valued according to their intrinsic value. Given the international designation of the RSPB reserve, this has been used to assign significance.

In assigning value to species, reference to a species' geographical distribution, and its population status (e.g. widespread, common, rare) and trends (e.g. declining, stable) has been made. A species that is rare and declining may be assigned a higher level of importance than one that is rare but known to be stable. Species which have a significant proportion of their European population in the UK may also be highly valued.

Methods for Assessment Nature and Significance of Ecological Impacts

Impact Identification

The sensitivity (and recoverability) of receptors to an impact has been identified, as far as current knowledge allows. Generally, this is, by necessity, a qualitative assessment based on published literature and best available scientific information.

Impact characterisation

Impacts were characterised by reference to the following terms and definitions where appropriate:

- Positive (a change that improves the quality of the environment);
- Negative (a change which reduces the quality of the environment);
- Extent (the spatial or geographical area over which the impact/effect may occur);
- Magnitude (size, amount, intensity and volume);
- Duration (should be defined in relation to ecological characteristics (such as a species' lifecycle) as well as human timeframes);

- Timing (timing of an activity or change may result in an impact if it coincides with critical life-stages or seasons e.g. bird nesting season);
- Frequency (the number of times an activity occurs will influence the resulting effect); and
- Reversibility.

Consideration was given to the potential for impacts to interact with other impacts (either arising from the proposed development or a different (external) source), thus producing a cumulative effect (often of greater magnitude).

Significance

For the purpose of the assessment within this report, impacts are considered significant if they either support or undermine biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general.

Residual Impacts

The available means to avoid, minimise or mitigate for negative impacts have been identified. Then, subject to their acceptability, these means have been incorporated in the design of the proposal, so that the final assessment of impact identified impacts that would be left. The consequences for development control, policy guidance and legislative compliance were then identified from the predicted residual impacts.

Assessment of Potential Impacts/Effects

The following table sets out the primary terms used to describe impacts in each of the sections below covering impacts on ecology.

Table 3.1 Terms for describing ecological impacts/effects

Severity	Periodicity	Extent
Positive	Temporary	Local
	Short-term	Metropolitan/County/District
	Medium-term	Regional
Negative	Long-term	National- National population context
	Permanent - no recovery to previous state within lifespan of project	International – international context

Further to the terms set out in the table above, ‘Negligible’ has been utilised where no significant change to existing nature conservation value would arise from the proposed development.

Zone of influence

Given the nature of the proposals, there are two zone of influence considered as part of the development:

- The area proposed for the proposed Visitor Centre and car park. The Zone of Influence (Zol) for this work is considered to be 20m surrounding the development footprint comprising largely scrub, hardstanding; and
- The Zol for the formalising of the paths is considered to be 20m for habitats and notable plants. Considering the recommended buffer zones for human disturbance (see Table 6.2 below) the Zol for breeding and overwintering birds is up to 1km.

Assessment Scope

Following a review of development proposals, historical survey data and the phase II survey results, the following ecological features have the potential to be affected by the proposals and these are therefore the focus of the EcIA:

- Designated sites
- Habitats
- Notable plants:
- Invasive Species
- Breeding birds;
- Amphibians;
- Reptiles:
- Invertebrates:

The following ecological receptors are also included within the EcIA:

- Smooth newt, common toad and common frog;
- Riparian mammals;
- Bats; and
- Badgers.

3.3 SURVEYORS

Laura Thomas, Senior Consultant, who prepared this report, has an undergraduate degree in Biology (BSc Hons) and a Master's degree in Evolutionary and Behavioural Ecology, holds a Natural England Bat Survey Level 1 Class Licence and is a Graduate member of CIEEM. Laura has over 5 years' experience in the commercial sector.

Chloe Peace, Consultant, who updated the breeding and overwintering bird and natterjack toad section, has a BSc (Hons) in Zoology and is a Qualifying member of CIEEM. Chloe has over two years of experience in ecological survey and assessment in consultancy with a particular focus on design and delivery of bird surveys. Her experience spans the aquatic and terrestrial environments, with particular interest in Biodiversity Net Gain (BNG), natural capital, habitat management and conservation, and ornithology. Chloe has also been a trainee bird ringer with the British Trust for Ornithology (BTO) since 2021.

Fern Oscroft, who undertook the Update PEA, has an undergraduate degree in Conservation Biology (BSc Hons) and is a Qualifying member of CIEEM. Fern has four years' experience in the commercial sector. Fern's experience spans terrestrial environments, with PEA and Biodiversity Net Gain (BNG) being a particular interest.

Faye Durkin, who has reviewed this report has a first class BSc (Hons) in Environmental Science and MSc in Environmental Management. She is a full member of CIEEM and an Associate member of IEMA. She co-chairs the IEMA Biodiversity and Natural Capital Steering Group and is a member of the IEMA Policy and Practice Committee. She has over 16 years of ecological consultancy experience and is licenced to survey of bats and GCN in England and Wales. She has held mitigation licences for bats and GCN and holds a CL31 water vole displacement licence.

Dr. Stephanie Harper, who reviewed this report, has a BSc (Hons) and PhD in Environmental Sciences, and a Natural England Level 1 class licence for bats. She has 15 years' experience in ecological survey and consultancy.

Helen Bradshaw, Principal Consultant, who has reviewed this report, has a degree in Geography (BSc Hons) and 17 year's experience as an ecologist. She spent over a decade as a Local Authority Ecologist and holds class survey licences for both bats and GCN. She has held bat mitigation licences and worked on monitoring schemes for both bats and GCN. Helen is Chair of her local badger group and has worked extensively on badger surveying and monitoring as well as delivering badger vaccination schemes for 8 years. She holds a position as a charity trustee for the Cheshire Local Records Centre.

This report was written by Laura Thomas and reviewed and verified by Stephanie Harper and Faye Durkin and Helen Bradshaw who confirms in writing (see the QA sheet at the front of this report) that the report is in line with the following:

- Represents sound industry practice;
- Reports and recommends correctly, truthfully and objectively;
- Is appropriate given the local site conditions and scope of works proposed; and
- Avoids invalid, biased and exaggerated statements.

3.4 CONSTRAINTS

The PEA Update was undertaken outside of the peak botanical season (May - July) and as such, no floral species lists could be confirmed. Habitat Condition Assessment criteria have been assumed 'passed' where they were not able to be accurately assessed. Visitor pressure within 'the nature reserve',

and in particular dog walkers, meant that some field signs of protected species, such as otter and badger may be difficult to identify, or obscured or interfered with by dogs.

4.0 UPDATE PEA RESULTS

4.1 UPDATE PEA

Habitats

Visitor Centre and car park site

The broad habitat types within the proposed Visitor Centre and car park site were mostly consistent with the 2021/2022 PEA survey.

At the time of the March 2025 PEA Update, vegetation clearance of bramble (*Rubus fruticosus*) and hawthorn (*Crataegus monogyna*) scrub had been undertaken. This left areas of bare or sparsely vegetated ground. However, due to this being a temporary loss of habitat, and the regrowth of bramble since, this has been mapped as 'Bramble scrub'. 'Lowland meadow' and 'Calcareous grassland' had been previously identified. These were found to still be existing within the site.

Minor changes to the 2021/2022 PEA habitat include refined mapping of hardstanding areas, the distinction of 'Bramble scrub' and 'Hawthorn scrub' to the patch to the northwest, and the encroachment of bramble scrub into 'Lowland meadow' and scrub encroachment from 'Calcareous grassland' to the south east corner of the proposed Visitor Centre and car park site.

Nature reserve

The broad habitat types within the nature reserve were mostly consistent with the 2021/2022 PEA survey.

At the time of the March 2025 Update PEA, vegetation clearance of bramble, hawthorn and gorse (*Ulex europaeus*) scrub had been undertaken at the proposed bird hide locations to allow for Site Investigations (SI) works. These left areas of shorter scrub, or glades within scrub habitat. However, due to the overall habitat type remaining as 'scrub' these have not been individually mapped.

Notable changes of habitat include the addition of 'Standing water' along the northeastern boundary of the nature reserve, change of habitat type from 'Grassland' to 'Sparsely vegetated land' to the southern corner of 'the nature reserve', change of habitat type from 'calcareous grassland' to 'Mixed scrub' to the western boundary of 'the nature reserve'.

Species

Nesting and breeding birds

Visitor Centre and car park site

The 2021/2022 PEA identified that the scrub habitat within the site would provide good nesting opportunities for breeding birds.

Vegetation clearance within the proposed Visitor Centre and car park site for SI works carried out winter 2024/25 has reduced the nesting and foraging habitat for birds, however patches of hawthorn and bramble scrub are remaining. During the site walkover, five bird nests were identified within the

proposed Visitor Centre and car park site', three of which were belonging to wood pigeon (*Columba palumbus*), bullfinch (*Pyrrhula pyrrhula*) and song thrush (*Turdus philomelos*), with the other two unidentified.

Nature reserve

During the previous 2021/2022 PEA survey, numerous nests were seen in trees/scrub on site and breeding bird activity was observed.

The nature reserve has had limited change of habitats and is dominated by mixed scrub habitat, comprising hawthorn, bramble, willow (*Salix* sp.) and gorse, which offer a range of opportunities for nesting birds.

Invertebrates

Visitor Centre and car park site

During the 2021/2022 PEA it was noted that there were many anthills present in grassland. During the further invertebrate surveys, dingy skipper (*Erynnis tages*) and weevil sp. (*Orthochaetes setiger*) were identified, amongst other invertebrate species.

Aside from the scrub clearance, the broad habitat types within the proposed Visitor Centre and car park site remain consistent with those previously recorded, with hawthorn scrub dominating the site and areas of grassland. Therefore, it is deemed that the quality of the site for notable invertebrate species remains the same, and findings are consistent with those of the previous PEA.

Nature reserve

During the 2021/2022 PEA and invertebrate survey, many species of invertebrates were identified including blue damselflies (*Enallagma cyathigerum*), cinnabar moths (*Tyria jacobaea*) and their caterpillars, orange-tip butterfly (*Anthocharis cardamines*), meadow brown butterfly (*Maniola jurtina*), speckled wood butterfly (*Pararge aegeria*), and ant hills in the grassland. And notably; weevil sp. (*Attactagenus plumbeus*), Saprinus sp. (*Saprinus aeneus*), small heath butterfly (*Coenonympha nymphula*), and vineyard snail (*Cernuella virgata*).

The nature reserve has had limited change of habitats. The nature reserve has a matrix of scrub habitat, grassland, standing water and lagoons in which notable and protected invertebrate species can forage, refuge and breed.

Amphibians

Visitor Centre and car park site

During the 2021/2022 PEA and further survey work, it was considered that amphibians were determined to be likely absent from the site.

During the March 2025 PEA Update, it was found that there were still no waterbodies, and some of the dense vegetation had been cleared. The site is still deemed to be of low suitability for natterjack toad and GCN. However, given the fact there are no freshwater ponds within 250m of the redline boundary

it is considered that the likelihood of GCN dispersing onto site is considered highly unlikely and as such the site is considered negligible to support GCN.

Nature reserve

The 2021/2022 PEA concluded that the multiple ponds and standing water within the site, as well as the matrix of tussocky grassland and scrub, make the site suitable for amphibians. Froglets and toadlets were seen during the 2021/2022 PEA.

The nature reserve has had limited change in habitat types and contains standing water, tussocky grassland and dense scrub which provide good habitat for GCN and Natterjack toad. Since the previous amphibian survey, RSPB have undertaken some habitat creation as part of the Species Recovery Trust in the winter of 2023 on the nature reserve in order to improve the suitability for the site to support natterjack toads, this includes scrub clearance and creation of scrapes/ponds. As part of this, they undertook monitoring between April and August 2024 identify whether natterjacks would move back onto site.

Data returned from RSPB regarding natterjack toads indicated there is still likely absence of natterjacks on site itself during 2024.

There were no GCN identified during the 2021, 2022 surveys and therefore confirmed likely/absent from the nature reserve. There has been no records of GCN on the RSPB's historical data for the site. The lagoons on site were not surveyed presumably due to the fact they are too large for GCN (measuring 13100m² and 26000m²) when optimal size for ponds is considered to be around 50-250m¹⁰. In 2023, the RSPB received Species Recovery Trust to create new swales and pools on site specifically for natterjack toads (see below), and as such do not have any emergent vegetation for egg laying as such reducing suitability for GCN. As such the results from 2021/2022 amphibian surveys are considered to likely remain valid.

Reptiles

Visitor Centre and car park site

The 2021/2022 PEA deemed that the site was suitable for reptiles due to the tussocky grassland, scrub and open areas forming a mosaic of habitats, creating potential for common lizard and slow worm. It was found that the 'Visitor Centre and car park site' had a 'Good' population of common lizard (*Zootoca vivipara*) (Peak counts of 5 - 20 individuals) and 'Low' population of slow worm (*Anguis fragilis*) (Peak count of <5 individuals).

The vegetation clearance within the proposed Visitor Centre and car park site during winter 2024/2025 has created areas of bare and sparsely vegetated ground which may provide basking opportunities for reptiles, whilst the grassland and remaining scrub may provide refuge. Common lizards utilise tussocky grasslands bordering scrub habitat and may use areas on the edge of scrub habitat for basking. Therefore, it is considered that the suitability of the proposed Visitor Centre and car park site has not changed since the 2021/2022 PEA.

Nature reserve

During the 2021/2022 PEA and reptile surveys, it was determined that the matrix of habitats within 'the nature reserve' provide good habitat for reptiles. Common lizards were found to be present with a 'Good' population size and a 'Low' population of slow worm.

'The nature reserve' has had limited change in habitat types and contains standing water, tussocky grassland and dense scrub which provide good habitat for reptiles. It is considered that the suitability of the nature reserve for reptiles has not changed and the previous survey results are likely the same.

Foraging bats

Visitor Centre and car park site

During the 2021/2022 PEA it was considered likely that foraging and commuting habitat for bats was present on the edge of the scrub and over the grassland habitat and adjacent waterbody within the quarry.

The removal of some of the dense scrub within the 'Visitor Centre and car park site' is not considered to have impacted the sites value for commuting and foraging bats as there is still scrub and grassland present for foraging and commuting.

Nature reserve

During the 2021/2022 PEA it was considered likely that foraging and commuting habitat for bats was present on the edge of the scrub and over the grassland habitat and the waterbodies where not too exposed.

The habitats within the nature reserve are largely consistent with those detailed within the previous PEA reports and therefore will continue to support foraging and commuting bats throughout the development.

Badger

Visitor Centre and car park site

During the 2021/2022 PEA likely badger foraging signs were found in the grassland near the southern site boundary. However, no other field signs were identified.

The matrix of scrub and grassland provides good habitat for badgers. However, no field signs of foraging badger, or sett building, were identified during the site walkover. The bramble scrub removal may reduced some foraging resources for badger. Due to the density of the scrub habitats within the site, it is possible that badger setts may be present however no further evidence was identified during scrub clearance for SI works.

Nature reserve

During the 2021/2022 PEA, a partially excavated hole was noted in a large rubble bank and one pawprint was found elsewhere in the site.

'The nature reserve' is dominated by dense scrub, which provides good refuge for badgers, and tussocky grasslands, which provide good foraging habitat for badgers. The impacts of the development upon the scrub habitats of 'the nature reserve' are limited and therefore 'the nature reserve' will continue to provide good habitat for badgers.

Otter

Visitor Centre and car park site

No signs of otter were seen during the 2021/2022 PEA. It was deemed that the high disturbance levels within the site, due to the recycling centre, may deter otters from visiting the site or seeking shelter there.

There were few habitats suitable for otter within the proposed Visitor Centre and car park site. Therefore, it is considered that there is no significant change in the suitability of the proposed Visitor Centre and car park site for otter.

Nature reserve

No signs of otter were seen during the 2021/2022 PEA. It was deemed that if present, otter may forage within the lagoons and rest within the dense scrub areas. However, the high level of disturbance from visitors and dog walkers may deter otter from using the site.

The lagoons of 'the nature reserve' and the surrounding scrub and grassland habitats still provide good habitat for otter. The lagoons and surrounding habitats are unlikely to be significantly impacted by the development. No signs of otter were found during the March 2025 PEA Update, however the level of use of the site by dog walkers may hinder the identification of otter slides, dung, or prints. It is considered that there is no significant change in the available habitats, or the visitor pressure on-site since the previous PEA.

Invasive Non-native Species

Visitor Centre and car park site

Invasive Non-native Species (INNS) plant species were previously identified within the 'Visitor Centre and car park site' including wall cotoneaster and sea buckthorn.

The March 2025 PEA Update identified the continued presence of wall cotoneaster within the site. Field horsetail (*Equisetum arvense*) has been noted within the area of scrub cleared for SI works within the 'Visitor Centre and car park site'. Whilst this is not listed under the Wildlife and Countryside Act Schedule 9 species, it spreads easily and readily through rhizomes and root fragments.

Nature reserve

INNS plant species were previously identified within including wall cotoneaster, sea buckthorn, montbretia, variegated yellow archangel, and Japanese knotweed.

The area containing Japanese knotweed is no longer included within the red line boundary of the development, and as such was not considered within the PEA Update.

Variegated yellow archangel was found on along the entrance track to the nature reserve, and wall cotoneaster has been identified throughout the nature reserve.

The montbretia and sea buckthorn were not identified during the PEA walkover, however the survey was undertaken outside of the peak botanical season.

4.2 CONCLUSIONS

Habitats

The habitat types throughout the site appeared to be broadly the same as identified by previous NVC surveys. However, due to the time elapsed since the previous NVC surveys, it is recommended that an update NVC survey is carried out, during the optimal botanical season, to re-confirm the locations of notable habitats on site and identify any changes.

Species

The site is considered to likely to support the same species as identified during the 2021/2022 PEA and phase II survey reports and no additional protected or notable species were considered likely to be on the site.

5.0 ECOLOGICAL IMPACT ASSESSMENT

5.1 DESIGNATIONS

The Hodbarrow Nature Reserve lies within the Morecambe Bay and Duddon Estuary SPA, SAC, Ramsar (designated under the Convention on the Wetlands of International Importance especially as Waterfowl Habitat 1971 – the Ramsar Convention) and Site of Special Scientific Interest (SSSI). The proposed Visitor Centre and car park site lies just outside the boundary of these designations.

Morecambe Bay is a large estuary situated on the northwest English coast in Cumbria and Lancashire. The Bay includes the Duddon Estuary which is formed by the River Duddon and the smaller Kirkby Pool as they open into the Irish Sea at the south-west corner of the Lake District. Morecambe Bay contains a mosaic of coastal habitats covering a total of 61538.23 hectares and supports breeding and overwintering bird assemblages of international importance as well as nationally important numbers of natterjack toads and a rich assemblage of wetland plants and invertebrates.

The SPA and SAC sites are European sites or internationally designated sites referred to as National Site Network (NSN) sites (formally Natura 2000) under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 which aims:

- To maintain or, where appropriate, restore habitats and species listed in Annexes I and II of the Habitats Directive¹¹ to a favourable conservation status (FCS).
To contribute to ensuring, in their area of distribution, the survival and reproduction of wild birds and securing compliance with the overarching aims of the Wild Birds Directive¹².

Ramsar sites do not form part of the national site network however the above Ramsar sites overlaps with SACs and SPAs and all Ramsar sites remain protected in the same way as SACs and SPAs.

Legislation and Policy of relevance to receptors and sites described in this report are outlined in Appendix B. The reasons for each designation are described below.

This report should be read in conjunction with the (Shadow) Habitats Regulations Assessment: Assessment Of Likely Significant Effects (ALSE) (ref: J217RP01 Hodbarrow Reserve (s)ALSE 19.05.23 Final w apps) and (Shadow) Habitats Regulations Assessment: Appropriate Assessment (AA) (ref: J217RP02 Hodbarrow Reserve (s)AA 19.05.23 Final w apps).

Morecambe Bay and Duddon Estuary Special Protection Area¹³

Qualifying species

The site qualifies under Article 4.1 of the Directive (2009/147/EC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Table 5.1 Qualifying species at Morecambe Bay and Duddon Estuary

Species	Season	% of population
Whooper swan (<i>Cygnus Cygnus</i>)	Non-breeding	1.0% of GB population

Species	Season	% of population
Little egret (<i>Egretta garzetta</i>)	Non-breeding	3.0% of GB population
European golden plover (<i>Pluvialis apricaria</i>)	Non-breeding	1.0% of GB population (1991)
Bar-tailed Godwit (<i>Limosa lapponica</i>)	Non-breeding	8.0% of GB population
Ruff (<i>Calidris pugnax</i>)	Non-breeding	1.0% of GB population
Mediterranean gull (<i>Larus melancephalus</i>)	Non-breeding	1.0% of GB population
Little tern (<i>Sternula albifrons</i>)	Breeding	2.2% of GB population
Sandwich tern (<i>Sterna sandvicensis</i>)	Breeding	5.7% of GB population (1992)
Common tern (<i>Sterna hirundo</i>)	Breeding	2.0% of GB population (1991)

The site qualifies under Article 4.2 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season:

Table 5.2 Annex 2 Migratory species at Morecambe Bay and Duddon Estuary

Species	Season	% of population
Pink-footed goose (<i>Anser brachyrhynchus</i>)	Non-breeding	4.5% of biogeographic population
Common shelduck (<i>Tadorna tadorna</i>)	Non-breeding	2.0% of biogeographic population
Northern pintail (<i>Anas acuta</i>)	Non-breeding	4.2% of biogeographic population
Eurasian oystercatcher (<i>Haematopus ostralegus</i>)	Non-breeding	6.8% of biogeographic population
Grey plover (<i>Pluvialis squatarola</i>)	Non-breeding	1.0% of biogeographic population (1991)
Common ringed plover (<i>Charadrius hiaticula</i>)	Non-breeding	1.4% of biogeographic population
Eurasian curlew (<i>Numenius arquata</i>)	Non-breeding	1.5% of biogeographic population
Black-tailed godwit (<i>Limosa limosa</i>)	Non-breeding	4.0% of biogeographic population
Ruddy turnstone (<i>Arenaria interpres</i>)	Non-breeding	1.0% of biogeographic population

Species	Season	% of population
Red knot (<i>Calidris canutus</i>)	Non-breeding	7.3% of biogeographic population
Sanderling (<i>Calidris alba</i>)	Non-breeding	3.0% of biogeographic population (1991)
Dunlin (<i>Calidris alpina alpina</i>)	Non-breeding	2.0% of biogeographic population
Common redshank (<i>Tringa totanus</i>)	Non-breeding	4.6% of biogeographic population
Lesser black-backed gull (<i>Larus fuscus</i>)	Non-breeding	1.7% of biogeographic population
Lesser black-backed gull (<i>Larus fuscus graellsii</i>)	Breeding	2.7% of biogeographic population
European herring gull (<i>Larus argentatus argenteus</i>)	Breeding	1.0% of biogeographic population (1991)

Assemblage qualification

The site qualifies under Article 4.2 of the Directive (2009/147/EC) as it used regularly by over 20,000 seabirds in any season:

At time of the 1997 citation of Morecambe Bay SPA, the area supported 40,672 individual seabirds including: herring gulls, lesser black-backed gulls, Sandwich terns, common terns, and little terns.

The site qualifies under Article 4.2 of the Directive (2009/147/EC) as it used regularly by over 20,000 waterbirds in any season. During the period 2009/10 – 2013/14, the site held a five year peak mean value of 266,751 individual birds. The main components of the assemblage include all of the qualifying features listed above, as well as an additional 19 species present in numbers exceeding 1% of the GB total and / or exceeding 2,000 individuals: great white egret, Eurasian spoonbill, light-bellied brent goose (*Nearctic origin*), Eurasian wigeon, Eurasian teal, green-winged teal, mallard, ring-necked duck, common eider (non-breeding), common goldeneye, red-breasted merganser, great cormorant, northern lapwing, little stint, spotted redshank, common greenshank, black-headed gull, common (mew) gull and European herring gull (non-breeding).

Morecambe Bay Special Area of Conservation (SAC)¹⁴

The site qualifies under Article 6 of the habitats directive (92/43/EEC). The primary reason for its international designation includes the following Annex I habitats and Annex II species:

- Annex I Habitats
 - Estuaries
 - Mudflats and sandflats not covered by seawater at low tide

- Large shallow inlets and bays
- Perennial vegetation of stony banks
- Salicornia and other annuals colonizing mud and sand
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes")
- "Fixed coastal dunes with herbaceous vegetation ("grey dunes")" * Priority feature
- Humid dune slacks
- Annex II Species
 - Great crested newt;
- The Annex I habitats also present but are not a primary reason for selection of the site include:
- Sandbanks which are slightly covered by sea water all the time;
- Coastal lagoons * Priority feature;
- Reefs;
- Embryonic shifting dunes;
- Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) * Priority feature;
- Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*).

Duddon Estuary Ramsar¹⁵

Qualification for Ramsar criteria:

- Supports nationally important numbers of the rare natterjack toad, near the north-western edge of its range (an estimated 18-24% of the British population). Supports a rich assemblage of wetland plants and invertebrates- at least one nationally scarce plant and at least two British Red Data Book invertebrates;
- Supports nationally important numbers of waterfowl during spring and autumn passage
- Internationally important waterfowl assemblage (greater than 20,000 birds);
- Over winter the site regularly supports internationally important populations of knot (*Calidris canutus*) pintail (*Anas acuta*), redshank.

Duddon Estuary Site of Special Scientific Interest¹⁶

The citation includes information expanding on what has been described in relation to NSN sites designation. Extracts below have been selected from the SSSI citation to provide a broader picture.

"The Duddon Estuary is of international and national importance for wintering wildfowl and waders and provides a vital link in the chain of west coast estuaries used by migrating birds, as well as being of particular

importance as one of a series of estuaries on the north-west coast where the majority of the British population of natterjack toads occur."

"The mouth of the estuary forms an extensive flat sand plain, with the sands being very mobile. The mid and upper reaches of the estuary are flanked by saltmarsh and beyond high water are extensive sand dunes on both the north and south sides of the mouth of the estuary. These sand dune systems are particularly important for a diverse range of community types, supporting a number of rare and uncommon plants, as well as a variety of nationally rare and scarce invertebrate species. The past activities of the mining and iron-making industries have created a number of artificial habitats which have become areas of wildlife interest. These include the slag banks of Askham Pier and Borwick Rails, and the largest coastal lagoon in north-west England at Hodbarrow Lagoon "

Natterjack Toad

The natterjack toad is a nationally rare species in Britain and over 95% of the population is associated with five estuaries, the Alt, Ribble, Duddon, Esk and Solway. The Duddon Estuary itself is therefore one of the most important areas in Britain for this species and contains between 18–25% of the U.K. population, which in turn is equivalent to 50% of the Cumbrian natterjack toad population. The toads breed in ephemeral pools associated with a range of habitats including dune slacks, marshy grassland, bare sand and slag banks, and hibernate and forage in the surrounding semi-natural vegetation, artificial habitats and semi-improved pastures. Particular concentrations occur at Millom Ironworks, Sandscale Haws and the stretch of coast between Sandside and Dunnerholme, but the species is evenly distributed over the whole estuary.

Invertebrates:

As a result of the range of habitats found at North Walney and Sandscale, these two sites are also important for their invertebrate populations, many typical of coastal habitats with a number of rare and nationally scarce species including the digger wasp (*Psen littoralis*), the solitary bee (*Colletes cunicularis*), water beetles associated with brackish waters (*Octhebius marinus*) and (*O. auriculatus*), and moths including the Shore Wainscot (*Mythimna litoralis*) and the Portland moth (*Ochropleura praecox*).

Hodbarrow Nature Reserve

Whilst the above designations give an understanding of the importance of the site combined with the surrounding area, it is important to recognise the individual significance of Hodbarrow Nature Reserve.

The site is managed by the RSPB and a principal aim is to encourage and sustain breeding, overwintering and migratory bird assemblages which make integral contributions towards the wider designations. A successful management intervention was the creation of an island made from slag moved from elsewhere on the reserve to the Hodbarrow lagoon which now supports breeding numbers of little terns, common terns and Sandwich terns, eider, black-headed gulls and occasionally Mediterranean gulls. The slag is considered a stronghold for terns in the UK, with at least four species recorded breeding; at its peak it hosted 15% of the UK population of Sandwich terns. The site also

supports a number of wintering/passage waders which contribute towards the SSSI designation and include overwintering redshank, knot and passage black tailed godwit.

A review of the RSPB Hodbarrow Management Plan¹⁷ has also identified important plant species associated with the calcareous grassland on site which include dark red helleborine (*Epipactis atrorubens*), bee orchid (*Ophrys apifera*), pillwort (*Pilularia globulifera*), hound's-tongue (*Cynoglossum officinale*), common cudweed (*Filago vulgaris*), marsh helleborine (*Epipactis palustris*) lesser thyme-leaved sandwort (*Arenaria leptoclados*), sea spleenwort (*Asplenium marinum*), houndstongue (*Cynoglossum officinale*), early marsh-orchid (*Dactylorhiza incarnata*), Desmazeria marina, ploughman's-spikenard (*Inula conyza*), wild lettuce (*Lactuca virosa*).

The scrub, ponds, grassland mosaic on the site also have records of supporting natterjack toads, otter, dark green fritillary (*Speyeria aglaja*), grayling (*Hipparchia semele*), wall (*Lasiommata megera*), dingy skipper (*Erynnis tages*), Small pearl-bordered fritillary (*Boloria selene*), broad groove-head spider (*Monocephalus castaneipes*), diving beetles (*Ilybius subaeneus*, *Dytiscus circumflexus*), a whirligig beetle (*Gyrinus caspius*), a water beetle (*Laccobius atrocephalus*), a moss beetle (*Ochthebius punctatus*), weevils (*Trachyploeus aristatus*, *Sitona lineellus*, *Alophus triguttatus*, *Centorhynchus rapae*, *Anthonomus bituberculatus*), a robber fly (*Philonicus albiceps*), common pillwoodlouse (*Armadillidium vulgare*).

Assessment of Conservation Value

The highest of the above listed designations has been used to assign significance for the nature reserve. Therefore, the nature reserve is of **International importance**.

5.2 HABITATS

Proposed Visitor Centre

The following NVC communities were recorded on the proposed Visitor Centre and associated car parking site and are described below. Further detail on each of NVC classifications is presented in the Phase II survey report (553023cp10Apr25FV01_Phase2Addendum).

Table 5.3 gives the NVC communities and their distribution and importance.

Table 5.3 Proposed Visitor Centre area - NVC communities identified.

NVC Classification (Code)	Status	Value
Festuca ovina – Carlina vulgaris / (CG1)	Annex 1 habitat: Semi-natural dry grasslands and scrubland facies on calcareous substrates (H6210)	International
	HPI: Lowland Calcareous Grassland	
	LBAP: Calcareous Grasslands	

NVC Classification (Code)	Status	Value
Briza media – Brachypodium sylvaticum grassland	Annex 1 habitat- Semi-natural dry grasslands and scrubland facies on calcareous substrates (H6210)	International
	HPI: Lowland Calcareous Grassland	
	LBAP Calcareous Grassland	
Arrhenatherum elatius grassland Centaurea nigra sub-community (MG1e)	HPI: Lowland Meadow	Regional
	LBAP Hay Meadows and Lowland Pastures	
Eleocharis palustris swamp – Eleocharis palustris sub-community (S19a)	HPI: Ponds	Regional
Holcus lanatus – Juncus effusus rush-pasture Juncus inflexus sub-community (MG10b)	n/a	Local
Other habitats (that do not qualify for priority status)		
Eleocharis palustris swamp – Eleocharis palustris sub-community (S19a)		Site
W23c Ulex europaeus – Rubus fruticosus scrub – Teucrium scorodonia sub-community (W23c)		Site
W24 Rubus fruticosus – Holcus lanatus underscrub.		Site

Assessment of Conservation Value

Whilst not a feature of the SAC designation, the Annex 1: H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) is classified as **having International Importance**. The remaining habitats above have **Site to Regional Importance**.

20m buffer along BOAT and footpath

The following NVC communities were recorded within the 20m buffer either side the main paths on site and are described below. Further detail on each of NVC classifications is presented in Phase 2 survey report (551959ltMay23FV02_Phase2Surveys).

Table 5.4 gives the NVC communities and their national and regional distribution.

Table 5.4 Plant communities 20m buffer either side of proposed pathways

NVC Classification (Code)	Status	Level of Importance
Arrhenatherum elatius grassland/ Brachypodium pinnatum grassland (MG1/CG4)	Annex 1: H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	International
	HPI: Lowland Calcareous Grassland	
	LBAP: Calcareous Grasslands	
Cynosurus cristatus – Centaurea nigra / Avenula pubescens grassland / (MG5/ CG6)	Annex 1: H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	International
	HPI Lowland Calcareous Grassland and Lowland Meadows	
	LBAP: Hay Meadows and Lowland Pastures and LBAP: Calcareous Grasslands	
Festuca ovina–Carlina vulgaris/Lolium perenne- Cynosurus cristatus grassland (CG1 /MG6)	Annex 1: H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	International
	HPI: Lowland Calcareous Grassland	
	LBAP: Calcareous Grasslands	
Lolium perenne- Cynosurus cristatus grassland (CG6)	Annex 1: H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)	International
	HPI: Lowland Calcareous Grassland	
	LBAP: Calcareous Grasslands	
Festuca ovina–Carlina vulgaris / (CG1)	Annex 1: Semi-natural dry grasslands and scrubland facies on calcareous substrates (H6210)	International
	HPI: Lowland Calcareous Grassland	
	LBAP: Calcareous Grasslands	
Ammophila arenaria– Festuca rubra semi-fixed dune community (SD7)	Annex 1 H2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)	International
	HPI: Coastal Sand Dunes	
Festuca rubra–Galium verum fixed dune grassland	Annex 1 H2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)	International
	HPI: Coastal Sand Dunes	

NVC Classification (Code)	Status	Level of Importance
(SD8)		
Arrhenatherum elatius grassland Centaurea nigra sub-community (MG1e)	HPI: Lowland Meadow LBAP Hay Meadows and Lowland Pastures	Regional
Potamogeton pectinalus-Myriophyllum spicatum community (A11)	HPI: Eutrophic Standing Waters	Regional
Eleocharis palustris swamp-Eleocharis palustris sub-community (S19a)	HPI: Ponds	Regional
Lagoon	HPI: Eutrophic Standing Water *It is understood the lagoon is freshwater and so does not meet 'Annex I habitat Coastal Lagoons	Regional
Other habitats		
Arrhenatherum elatius grassland Festuca rubra sub-community (MG1a)		Site
Lolium ley (MG7)		Site
Equisetum fluviatile swamp (S10a)		Site
Ulex europaeus-Rubus fruticosus scrub-Teucrium scorodonia sub-community (W23c)		Site
Rubus fruticosus – Holcus lanatus underscrub (W24)		Site
Pteridium aquilinum- Rubus fruticosus underscrub Teucrium scorodonia sub-community (W25b)		Site
Argentina anserina-Carex nigra dune slack- Carex flacca sub-community (SD17b)		Site

Whilst there are priority habitats across the site a NVC survey has been undertaken only on habitats that fall within the Zone of Influence of proposals. Therefore, there may be some priority habitats on the nature reserve that have not been identified through in-depth survey but these will not be impacted by the proposals and are therefore not considered further.

Assessment of Conservation Value

The 'Fixed coastal dunes with herbaceous vegetation (grey dunes) habitat is cited within the SAC designation and therefore has **International Importance**. In addition, the Annex 1: H6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) is also classified as having **International Importance**. The remaining habitats have **Regional and Site Importance**.

5.3 NOTABLE PLANTS

Proposed Visitor Centre

A total of 7 important plant species were observed during surveys within this area including taxa of regional to local conservation importance. An overview of these species, their location, abundance and conservation importance can be found in Table 5.5

Table 5.5 Notable plants within the area proposed for the Proposed Visitor Centre and car park

Species	Conservation Status	Importance
Common cudweed (<i>Filago germanica</i>)	- Near-Threatened in England - Rare across the region of north-west England - Cumbria RPR	Regional importance
Fern-grass (<i>Catapodium rigidum</i>)	- North-west England - Local in Cumbria	
Wild marjoram (<i>Origanum vulgare</i>)	- Least Concern in England - Local as a native plant in Cumbria	County importance
Carlina thistle (<i>Carlina vulgaris</i>)	- Near-threatened in England - Local in Cumbria	Local importance
Eyebright (<i>Euphrasia</i> sp.) Likely to be <i>E. nemorosa</i> or <i>E. confusa</i>	- Near-Threatened or Vulnerable in England - Widespread in Cumbria	
Quaking-grass (<i>Briza media</i>)	- Near-threatened in England - Widespread locally	
Wild strawberry (<i>Fragaria vesca</i>)	Near-threatened in England and widespread	

Assessment of Conservation Value

The notable plants on site range from **Local to Regional Importance**.

20m buffer along BOAT and footpath

A total of 30 important plant species were observed during surveys within this area including taxa of international to local conservation importance. An overview of these species, their location, abundance and conservation importance can be found in Table 5.6

Table 5.6 Plant communities within 20m buffer of proposed paths

Species	Conservation Status	Importance
Irish dandelion (<i>Taraxacum aesculosum</i>)	- Nationally rare in Britain - Critically Endangered for England	High (international level importance)
Pillwort (<i>Pilularia globulifera</i>)	- Nationally scarce in Britain - Vulnerable in England - S.41 species - Listed on Cumbria Rare Plant Register (RPR)	High (national importance)
Moonwort (<i>Botrychium lunaria</i> s.s.)	- Vulnerable in England; - Scarce in Cumbria and North West England - S.41 Species	High (regional importance)
Small-fruited yellow sedge (<i>Carex oederi</i>)	- Nationally scarce in Britain - Least Concern in England - Rare in the region of north-west England Scarce on the Cumbria RPR	
Thread-leaved water-crowfoot (<i>Ranunculus trichophyllos</i>)	- Least Concern in England - Rare within the region of north-west England	
Fennel pondweed (<i>Potamogeton pectinatus</i>)	- Least Concern in England - Rare species in Cumbria	County importance
Spiked water milfoil (<i>Myriophyllum spicatum</i>)	Least Concern in England	
Eyebright sp. (<i>Euphrasia nemorosa/confusa</i>)	- Near-Threatened or Vulnerable in England - Widespread in Cumbria	

Species	Conservation Status	Importance
Few-flowered spike-rush (<i>Eleocharis quinqueflora</i>)	- Least Concern in England - SCI plant for north-west England	Local importance
Flea Sedge (<i>Carex pulicaris</i>)	- Near-threatened in England - Widespread and local in Cumbria	
Heath speedwell (<i>Veronica officinalis</i>)	- Near-threatened in England - Widespread in Cumbria	
Lesser spearwort (<i>Ranunculus flammula</i>)	- Least Concern in England - Widespread but local Cumbria, - SCI plant for north-west England	
Marsh pennywort (<i>Hydrocotyle vulgaris</i>)	- Near-threatened in England - Widespread in Cumbria	
Northern marsh orchid (<i>Dactylorhiza purpurella</i>)	- Widespread in Cumbria and Northern Britain - SCI within north-west England	
Tormentil (<i>Potentilla erecta</i>)	Near-threatened in England and widespread.	
Eyebright sp. (<i>Euphrasia nemorosa/confusa</i>)	- Near-Threatened or Vulnerable in England - Widespread in Cumbria	
Wild strawberry (<i>Fragaria vesca</i>)	Near Threatened in England and widespread	

Assessment of Conservation Value

The notable plants on site range from **Local to High International Importance**.

Nature reserve

RSPB records of the nature reserve were reviewed for further notable species across the site covering areas outside of the NVC survey area; these are listed in the table below.

Table 5.7 RSPB records of notable plants on site

Species	Importance
Flowering plants	
Dark red helleborine (<i>Epipactis atrorubens</i>)	Nationally scarce
Bee orchid (<i>Ophrys apifera</i>)	Regionally important
Pillwort (<i>Pilularia globulifera</i>)	Near threatened, nationally scarce

Species	Importance
Hound's-tongue (<i>Cynoglossum officinale</i>)	Near threatened
Common cudweed (<i>Filago vulgaris</i>)	Near threatened
Marsh helleborine (<i>Epipactis palustris</i>)	Regionally important
Hounds tongue (<i>Cynoglossum officinale</i>)	Near Threatened Regionally important plant communities. Present on reserve in1986
Lesser thyme-leaved sandwort (<i>Arenaria leptoclados</i>)	Regionally important plant communities. Present on reserve in1986
Sea spleenwort (<i>Asplenium marinum</i>)	Regionally important plant communities. Present on reserve in1986
early marsh-orchid (<i>Dactylorhiza incarnata</i>)	Regionally important plant communities. Present on reserve in1986
<i>Desmazeria marina</i>	Regionally important plant communities. Present on reserve in1986
Ploughman's-spikenard (<i>Inula conyza</i>)	Regionally important plant communities. Present on reserve in1986
Wild lettuce (<i>Lactuca virosa</i>)	Regionally important plant communities. Present on reserve in1986
Fungi	
Violet Bramble Rust (<i>Phragmidium violaceum</i>)	Widespread and fairly common in Britain
Scarlet elf cup (<i>Sarcoscypha austriaca</i>)	Widespread but scarce
Yellow Brain (<i>Tremella mesenterica</i>)	Fairly common and widespread in Britain.
Waxcap species	Varied

5.4 BREEDING BIRDS

An assessment of the importance of the habitats of the area proposed for the proposed Visitor Centre and by the nature reserve for breeding birds has been made below.

Proposed Visitor Centre

Whilst no breeding bird surveys were undertaken in this area, the habitats that birds could nest in include dense bramble (*Rubus fruticosus*) scrub, hawthorn (*Crataegus monogyna*) and willows (*Salix* sp).

According to RSPB records there are breeding warblers including whitethroat and lesser whitethroat on site of which the scrub habitat could support.

The following bird species were noted as using habitats around the nature reserve, and that would likely nest in dense scrub habitat. The status of each has been assessed included within Table 4.7 below as well

as their respective conservation status. As there is no breeding bird data available, the geographic value of the species has been estimated using information gathered from Cumbria Biodiversity Data Centre¹⁸.

The conservation and legislative status has also been provided for each species, detailing:

- Birds of Conservation Concern (BoCC) status (Red, Amber or Green);
- Any extra legislative protection above standard including the under Schedule 1 and Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) (WCA) (Schedule 1; Schedule 9);
- The inclusion of species under the Annex I of the European Union (EU) Directive on the Conservation of Wild Birds (also known as the Birds Directive), listed in the designation for the Morecambe Bay and Duddon Estuary Special Protection Area (SPA) (Qualifying species for SPA designation); and

Those listed Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (S41 NERC).Table 5.8

Birds likely to nest within the dense scrub associated with the area selected for the Proposed Visitor Centre

Common name	Scientific name	Conservation and Legislative Status	Geographic Value
Greenfinch	<i>Chloris chloris</i>	Red	Local
Linnet	<i>Linaria cannabina</i>	Red	Local
Dunnock	<i>Prunella modularis</i>	Amber S41 NERC	Local
Song thrush	<i>Turdus philomelos</i>	Amber S41 NERC	Local
Bullfinch	<i>Pyrrhula pyrrhula</i>	Amber S41 NERC	Local
Wren	<i>Troglodytes troglodytes</i>	Amber	Local
White throat	<i>Sylvia communis</i>	Amber	Local
Willow warbler	<i>Phylloscopus trochilus</i>	Amber	Local
Magpie	<i>Pica pica</i>	Green	Site
Chaffinch	<i>Fringilla coelebs</i>	Green	Site
Blackbird	<i>Turdus merula</i>	Green	Site
Goldfinch	<i>Carduelis carduelis</i>	Green	Site
Robin	<i>Erithacus rubecula</i>	Green	Site
Wood pigeon	<i>Columba palumbus</i>	Green	Site
Crow	<i>Corvus corone</i>	Green	Site
Great tit	<i>Parus major</i>	Green	Site
Blue tit	<i>Cyanistes caeruleus</i>	Green	Site
Chiffchaff	<i>Phylloscopus collybita</i>	Green	Site

Common name	Scientific name	Conservation and Legislative Status	Geographic Value
Blackcap	<i>Sylvia atricapilla</i>	Green	Site
Long-tailed tit	<i>Aegithalos caudatus</i>	Green	Site

Assessment of Conservation Value

The scrub habitat on site likely to support breeding birds is widespread and abundant within the locality, reducing the importance of the habitat onsite to the local breeding bird assemblage. None of the birds identified within Table 5.8 above have been listed as rare or scarce in Cumbria (even though some of the birds are Red and Amber listed, they are still numerous and widespread in the UK). Therefore, the scrub habitat onsite has value at the **Local level** for breeding birds.

Hodbarrow Nature reserve

RSPB have provided the breeding bird data for the entire historical breeding bird data up to 2024. The number of breeding pairs in 2024 has been provided in the table below. Where no birds were observed in 2024, their peak count since 2000 was given.

Table 5.9 Number of breeding pairs for species in 2023 and 2024

Common Name	Scientific Name	Conservation and Legislative Status	Breeding Pairs 2023	Breeding Pairs 2024
Habitats around the nature reserve				
Linnet	<i>Carduelis cannabina</i>	Red; S41 NERC	No data	5
Grasshopper warbler	<i>Locustella naevia</i>	Red; S41 NERC	No data	0
Greenfinch	<i>Chloris chloris</i>	Red	No data	2
Bullfinch	<i>Pyrrhula pyrrhula</i>	Amber; S41 NERC	No data	1
Reed bunting	<i>Emberiza schoeniclus</i>	Amber; S41 NERC	No data	1
Dunnock	<i>Prunella modularis</i>	Amber; S41 NERC	No data	4
Song thrush	<i>Turdus philomelos</i>	Amber; S41 NERC	No data	4
Whitethroat	<i>Sylvia communis</i>	Amber	No data	4
Sedge warbler	<i>Acrocephalus schoenobaenus</i>	Amber	No data	0
Willow warbler	<i>Phylloscopus trochilus</i>	Amber	No data	23

Common Name	Scientific Name	Conservation and Legislative Status	Breeding Pairs 2023	Breeding Pairs 2024
Wren	<i>Troglodytes troglodytes</i>	Amber	No data	10
Meadow pipit	<i>Anthus pratensis</i>	Amber	No data	2
Wood pigeon	<i>Columba palumbus</i>	Amber	No data	5
Rock pipit	<i>Anthus petrosus</i>	Green	No data	1
Pied wagtail	<i>Motacilla alba</i>	Green	No data	1
Robin	<i>Erithacus rubecula</i>	Green	No data	11
Stonechat	<i>Saxicola torquatus</i>	Green	No data	1
Blackbird	<i>Turdus merula</i>	Green	No data	3
Blackcap	<i>Sylvia atricapilla</i>	Green	No data	9
Lesser whitethroat	<i>Sylvia curruca</i>	Green	No data	1
Reed warbler	<i>Acrocephalus scirpaceus</i>	Green	No data	2
Chiffchaff	<i>Phylloscopus collybita</i>	Green	No data	16
Great tit	<i>Parus major</i>	Green	No data	3
Blue tit	<i>Cyanistes caeruleus</i>	Green	No data	4
Long-tailed tit	<i>Aegithalos caudatus</i>	Green	No data	0
Magpie	<i>Pica pica</i>	Green	No data	0
Jay	<i>Garrulus glandarius</i>	Green	No data	0
Carrion crow	<i>Corvus frugilegus</i>	Green	No data	1
Chaffinch	<i>Fringilla coelebs</i>	Green	No data	9
Goldfinch	<i>Carduelis carduelis</i>	Green	No data	4
Lagoon				
Ringed plover	<i>Charadrius hiaticula</i>	Red; Qualifying species for SPA designation	9	5
Oystercatcher	<i>Haematopus ostralegus</i>	Amber; Qualifying species for SPA designation	5	11
Shelduck	<i>Tadorna tadorna</i>	Amber; Qualifying species for SPA designation	1	1

Common Name	Scientific Name	Conservation and Legislative Status	Breeding Pairs 2023	Breeding Pairs 2024
Lapwing	<i>Vanellus vanellus</i>	Red; S41 NERC	1	5
Common gull	<i>Larus canus</i>	Red	No data	No data
Greylag goose	<i>Anser anser</i>	Amber; Schedule 1	3	2
Spoonbill	<i>Platalea leucorodia</i>	Amber; Schedule 1	4	1
Mallard	<i>Anas platyrhynchos</i>	Amber	1	1
Eider	<i>Somateria mollissima</i>	Amber	71	79
Red-breasted merganser	<i>Mergus serrator</i>	Amber	1	1
Moorhen	<i>Gallinula chloropus</i>	Amber	12	3
Great crested grebe	<i>Podiceps cristatus</i>	Green	1	1
Cormorant	<i>Phalacrocorax carbo</i>	Green	1	43
Grey heron	<i>Ardea cinerea</i>	Green	0	1
Tufted duck	<i>Aythya marila</i>	Green	4	3
Little egret x Cattle egret	<i>Egretta garzetta</i> x <i>Bubulcus ibis</i>	N/A	30	1
Canada goose	<i>Branta canadensis</i>	Not assessed; Schedule 9	5	3

Table 5.10 Peak number of adults, adults on nests (AONs), and fledglings for tern species (*Sternidae* spp.) and black-headed gull (*Chroicocephalus ridibundus*) in 2023 and 2024

Common Name	Scientific Name	Conservation and Legislative Status	Peak No. of Adults	Peak No. of AONs	Peak No. of Fledglings
2023					
Sandwich tern	<i>Thalasseus sandvicensis</i>	Amber; Qualifying species for SPA designation	927	596	335
Common tern	<i>Sterna hirundo</i>	Amber; Qualifying species for SPA designation	80	53	78

Common Name	Scientific Name	Conservation and Legislative Status	Peak No. of Adults	Peak No. of AONs	Peak No. of Fledglings
Little tern	<i>Sternula albifrons</i>	Amber; Schedule 1; Qualifying species for SPA designation	81	53	0
Black-headed gull	<i>Chroicocephalus ridibundus</i>	Amber	1202	590	307
Arctic tern	<i>Sterna paradisaea</i>	Amber	7	3	0
2024					
Sandwich tern	<i>Thalasseus sandvicensis</i>	Amber; Qualifying species for SPA designation	805	332	396
Common tern	<i>Sterna hirundo</i>	Amber; Qualifying species for SPA designation	102	63	39
Little tern	<i>Sternula albifrons</i>	Amber; Schedule 1; Qualifying species for SPA designation	72	32	7
Black-headed gull	<i>Chroicocephalus ridibundus</i>	Amber	1187	796	735
Arctic tern	<i>Sterna paradisaea</i>	Amber	15	4	0

Assessment of Conservation Value

The Hodbarrow lagoon supports qualifying species for the wider designation as well as notable red list species, schedule 1 species and S.41 species.

There was only one new species returned for the site between 2023 and 2024, pertaining to the little egret x cattle egret hybrid.

There were six species returned between 2023 and 2024 that had been previously recorded at the site, but not during the breeding bird season (April to August inclusive). These pertained to; rock pipit, stonechat, grasshopper warbler, long-tailed tit, jay, arctic tern. However, none of these species are listed under Annex I of the Morecambe Bay and Duddon Estuary SPA.

The Hodbarrow lagoon is an important refuge for breeding terns on the purpose-built limestone slag island within Hodbarrow lagoon, with a maximum of 15% of the U.K. population of Sandwich Terns.

The Hodbarrow lagoon is used regularly by over 20,000 sea birds in any one season and used regularly by 1% or more of the Great Britain populations of species listed in Annex I in any season including breeding little tern, Sandwich tern, common tern as well as regularly by 1% or more of the biogeographical populations of regularly occurring migratory species (other than those listed in Annex I) in any one season including breeding lesser black-backed gull, European herring gull.

The breeding bird assemblage is consequently evaluated to be of **International value**.

5.5 OVERWINTERING BIRDS

Proposed Visitor Centre and car park

The terrestrial habitats associated with the proposed Visitor Centre and car park site do not have value for notable overwintering bird species which typically require large expanses of water.

Assessment of Conservation Value

Overall, the proposed Visitor Centre and car park site has **Negligible importance** for overwintering birds.

Nature reserve

Notable and rare wintering and passage bird species recorded on the RSPB reserve areas are set out in the Table 5.1 below along with any relevant conservation status.

The peak count has been included in the 'Peak Count in Winter 2023/2024 (Peak Count in last 10 years i.e. since 2014)'. This includes the peak count recorded in the winter 2023/2024, however where a larger peak count has been recorded in the last 10 years (i.e. since 2014) then this has been included in brackets with the number and year recorded. Where the same peak count has been recorded in multiple years, the most recent peak count has been detailed.

Table 5.11 Wintering bird assemblages at Hodbarrow (2012-2024)

Common name	Species name	Conservation Status	Peak Count in Winter 2023/2024 (Peak Count in last 10 years i.e. since 2014)
Black-tailed godwit	<i>Limosa limosa</i>	Red LBAP Qualifying species for SPA designation	7 (50 in 2017)
Curlew	<i>Numenius arquata</i>	Red LBAP Qualifying species for SPA designation	28 (300 in 2019)
Dunlin	<i>Calidris alpina alpina</i>	Red Qualifying species for SPA designation	38 (600 in 2020)
Ringed plover	<i>Charadrius hiaticula</i>	Red list Qualifying species for SPA designation	6 (100 in 2016)
Goldeneye	<i>Bucephala clangula</i>	Red	58 (peak count)
Pochard	<i>Aythya ferina</i>	Red	0 (16 in 2017)
Scaup	<i>Aythya marila</i>	Red LBAP	1 (10 in 2017)
Slavonian grebe	<i>Podiceps auritus</i>	Red	0 (2 in 2014)
Grasshopper warbler	<i>Locustella naevia</i>	Red	0 (1 in 2022)
Great black-backed gull	<i>Larus marinus</i>	Red	6 (8 in 2017)
Greenfinch	<i>Carduelis chloris</i>	Red	0 (3 in 2015)
Herring gull	<i>Larus argentatus</i>	Red; Qualifying species for SPA designation	41 (205 in 2015)

Common name	Species name	Conservation Status	Peak Count in Winter 2023/2024 (Peak Count in last 10 years i.e. since 2014)
Lapwing	<i>Vanellus vanellus</i>	Red	453 (610 in 2020)
Linnet	<i>Carduelis cannabina</i>	Red	0 (20 in 2019)
Starling	<i>Sturnus vulgaris</i>	Red	0 (10 in 2020)
Bar-tailed godwit	<i>Limosa lapponica</i>	Amber Qualifying species for SPA designation	0 (27 in 2016)
Oystercatcher	<i>Haematopus ostralegus</i>	Amber Qualifying species for SPA designation	28 (550 in 2019)
Grey plover	<i>Pluvialis squatarola</i>	Amber Qualifying species for SPA designation	0 (42 in 2019)
Knot	<i>Calidris canutus</i>	Amber Qualifying species for SPA designation	340 (peak count)
Mediterranean gull	<i>Larus melancephalus</i>	Amber Qualifying species for SPA designation	0 (2 in 2022)
Redshank	<i>Tringa totanus</i>	Amber Qualifying species for SPA designation	310 (2500 in 2020)
Sanderling	<i>Calidris alba</i>	Amber Qualifying species for SPA designation	0 (23 in 2022)
Turnstone	<i>Arenaria interpres</i>	Amber Qualifying species for SPA designation	24 (45 in 2020)

Common name	Species name	Conservation Status	Peak Count in Winter 2023/2024 (Peak Count in last 10 years i.e. since 2014)
Whooper swan	<i>Cygnus cygnus</i>	Amber Qualifying species for SPA designation	44 (27 in 2021)
Black-throated diver	<i>Gavia arctica</i>	Amber LBAP	0 (1 in 2021)
Black-headed gull	<i>Chroicocephalus ridibundus</i>	Amber	125 (622 in 2021)
Arctic tern	<i>Sterna paradisaea</i>	Amber	7 (2 in 2022)
Common gull	<i>Larus canus</i>	Amber	0 (19 in 2015)
Eider	<i>Somateria mollissima</i>	Amber	159 (648 in 2021)
Gadwall	<i>Anas strepera</i>	Amber	6 (13 in 2014)
Great northern diver	<i>Gavia immer</i>	Amber	0 (1 in 2022)
Greenshank	<i>Tringa nebularia</i>	Amber	2 (3 in 2020)
Little tern	<i>Sterna albifrons</i>	Amber	81 (peak count)
Pink-footed goose	<i>Anser brachyrhynchus</i>	Amber	70 (87 in 2021)
Pintail	<i>Anas acuta</i>	Amber	0 (13 in 2022)
Red-breasted merganser	<i>Mergus serrator</i>	Amber	68 (78 in 2021)
Sandwich tern	<i>Sterna sandvicensis</i>	Amber	927 (1950 in 2018)
Shoveler	<i>Anas clypeata</i>	Amber	2 (4 in 2019)
Spoonbill	<i>Platalea leucorodea</i>	Amber	0 (1 in 2022)
Wheatear	<i>Oenanthe oenanthe</i>	Amber	1 (peak count)
Wigeon	<i>Anas penelope</i>	Amber	103 (300 in 2020)

Common name	Species name	Conservation Status	Peak Count in Winter 2023/2024 (Peak Count in last 10 years i.e. since 2014)
Little egret	<i>Egretta garzetta</i>	Green Qualifying species for SPA designation	31 (71 in 2018)
Bullfinch	<i>Pyrrhula pyrrhula</i>	Amber	0 (4 in 2015)
Common tern	<i>Sterna hirundo</i>	Amber; Qualifying species for SPA designation	0 (60 in 2018)
Dunnock	<i>Prunella modularis</i>	Amber	0 (9 in 2015)
Greylag goose	<i>Anser anser</i>	Amber	86 (124 in 2015)
Kestrel	<i>Falco tinnunculus</i>	Amber	1 (2 in 2020)
Lesser black-backed gull	<i>Larus fuscus subsp. graellsii</i>	Amber; Qualifying species for SPA designation	62 (peak count)
Mallard	<i>Anas platyrhynchos</i>	Amber	98 (115 in 2017)
Meadow pipit	<i>Anthus pratensis</i>	Amber	0 (1 in 2022)
Moorhen	<i>Gallinula chloropus</i>	Amber	11 (15 in 2022)
Reed bunting	<i>Emberiza schoeniclus</i>	Amber	0 (2 in 2015)
Sedge warbler	<i>Acrocephalus schoenobaenus</i>	Amber	0 (8 in 2014)
Shelduck	<i>Tadorna tadorna</i>	Amber; Qualifying species for SPA designation	5 (18 in 2022)
Snipe	<i>Gallinago gallinago</i>	Amber	12 (42 in 2021)
Songthrush	<i>Turdus philomelos</i>	Amber	0 (10 in 2015)
Sparrowhawk	<i>Accipiter nisus</i>	Amber	1 (peak count)
Teal	<i>Anas crecca</i>	Amber	255 (820 in 2016)
Whitethroat	<i>Sylvia communis</i>	Amber	0 (9 in 2016)

Common name	Species name	Conservation Status	Peak Count in Winter 2023/2024 (Peak Count in last 10 years i.e. since 2014)
Willow warbler	<i>Phylloscopus trochilus</i>	Amber	0 (35 in 2015)
Wood pigeon	<i>Columba palumbus</i>	Amber	0 (9 in 2015)
Wren	<i>Troglodytes troglodytes</i>	Amber	0 (13 in 2015)
Golden plover	<i>Pluvialis apricaria</i>	Green	630 (647 in 2017)
Goosander	<i>Mergus merganser</i>	Green	0 (1 in 2017)
Great crested grebe	<i>Podiceps cristatus</i>	Green	4 (11 in 2022)
Rock pipit	<i>Anthus petrosus</i>	Green	0 (1 in 2022)
Garden warbler	<i>Sylvia borin</i>	Green	0 (3 in 2015)
Reed warbler	<i>Acrocephalus scirpaceus</i>	Green	0 (2 in 2015)
Canada goose	<i>Branta canadensis</i>	Introduced	65 (60 in 2019)
Blackbird	<i>Turdus merula</i>	Green	0 (15 in 2015)
Blackcap	<i>Sylvia atricapilla</i>	Green	0 (15 in 2015)
Blue tit	<i>Cyanistes caeruleus</i>	Green	0 (12 in 2015)
Buzzard	<i>Buteo buteo</i>	Green	0 (1 in 2021)
Carrion crow	<i>Corvus corone</i>	Green	0 (3 in 2015)
Chaffinch	<i>Fringilla coelebs</i>	Green	0 (30 in 2015)
Chiffchaff	<i>Phylloscopus collybita</i>	Green	0 (17 in 2015)
Coot	<i>Fulica atra</i>	Green	21 (285 in 2014)
Cormorant	<i>Phalacrocorax carbo</i>	Green	73 (183 in 2018)
Goldcrest	<i>Regulus regulus</i>	Green	0 (1 in 2015)
Goldfinch	<i>Carduelis carduelis</i>	Green	0 (9 in 2021)

Common name	Species name	Conservation Status	Peak Count in Winter 2023/2024 (Peak Count in last 10 years i.e. since 2014)
Great tit	<i>Parus major</i>	Green	0 (5 in 2015)
Grey heron	<i>Ardea cinerea</i>	Green	6 (5 in 2020)
Jay	<i>Garrulus glandarius</i>	Green	0 (1 in 2022)
Kingfisher	<i>Alcedo atthis</i>	Green	1 (peak count)
Lesser whitethroat	<i>Sylvia curruca</i>	Green	0 (3 in 2021)
Little grebe	<i>Tachybaptus ruficollis</i>	Green	13 (18 in 2021)
Long-tailed tit	<i>Aegithalos caudatus</i>	Green	0 (1 in 2021)
Magpie	<i>Pica pica</i>	Green	0 (3 in 2014)
Mute swan	<i>Cygnus olor</i>	Green	27 (72 in 2014)
Peregrine falcon	<i>Falco peregrinus</i>	Green	0 (2 in 2022)
Pheasant	<i>Phasianus colchicus</i>	Green	0 (1 in 2014)
Pied wagtail	<i>Motacilla alba</i>	Green	0 (2 in 2022)
Raven	<i>Corvus corax</i>	Green	1 (2 in 2022)
Reed warbler	<i>Acrocephalus scirpaceus</i>	Green	0 (2 in 2015)
Robin	<i>Erithacus rubecula</i>	Green	0 (18 in 2015)
Sand martin	<i>Riparia riparia</i>	Green	0 (10 in 2015)
Stonechat	<i>Saxicola torquata</i>	Green	0 (1 in 2020)
Water rail	<i>Rallus aquaticus</i>	Green	0 (1 in 2014)

Assessment of Conservation Value

The wintering bird assemblage is a contribution to the Duddon Estuary and Morcambe Bay SPA interest feature. Qualifying species were recorded within the nature reserve particularly associated with the wetland/lagoon habitat. The wintering bird assemblage is consequently evaluated to be of at **International** value associated predominantly with the lagoon habitat.

5.6 NATTERJACK TOADS

Proposed Visitor Centre

Habitats associated with the proposed Visitor Centre and car park are deemed unsuitable.

It should be noted, however, that anecdotal evidence provided by the general public to Greengage surveyors and supported by photographs showed a natterjack toad on the road to the recycling centre near the Annex 1 grassland. However, this is likely to be sporadic and occasional. As a precaution, the proposed Visitor Centre and car park site has been awarded **National value** for natterjack toads.

Nature reserve

The site falls within the Duddon Estuary Ramsar designation of which one of the qualifying features is supporting nationally important numbers of natterjack toads an estimated 18-24% of the British population. The desk-based study revealed several records within Hodbarrow Nature Reserve. Surveys in 2017 recorded identified approximately 40 adult natterjack toads on the tern island. There have been no records in recent years however survey effort is limited and the increase in breeding birds using the islands is likely to have reduced the success of natterjack toads. Natterjacks also bred in a series of “mitigation” ponds created in 2017.

Since the previous amphibian survey, the RSPB have undertaken habitat creation as part of the Species Recovery Trust funding in the winter of 2023 in order to improve the suitability for the nature reserve to support natterjack toads. Work included scrub clearance and creation of scrapes/ponds, incorporating monitoring between April and August 2024 to identify presence/likely absence of natterjacks following the additional habitat creation.

Data returned from the RSPB natterjack toad monitoring indicated the continued likely absence of natterjacks on the site during 2024. However, in keeping with the previous amphibian survey results, natterjack calls were recorded just off site to the east in April and August 2024. Details of amphibian monitoring data recorded in 2024 is detailed in Table 3.2 below.

Table 3.2 Amphibian data from 2024 monitoring

Common Name	Scientific Name	Date	Details
Natterjack toad	<i>Epidalea calamita</i>	April 2024	Up to 8 males recorded calling just offsite to the east in neighbouring habitat approximately 40m from the site boundary.
Natterjack toad	<i>Epidalea calamita</i>	August 2024	Approximately 4 to 5 males recorded calling just offsite to the east, approximately 40m from the site boundary.

Common Name	Scientific Name	Date	Details
Common toad (assumed)	<i>Bufo bufo</i>	April 2024	Approximately 5000 tadpoles recorded on site assumed to be common toad.

The 2024 surveys confirmed presence within a known natterjack breeding pond approximately 40m from the site with no significant barrier onto site.

Given the records of natterjacks in the locality and on site, the potential for habitats to become more suitable in the future, the nature reserve is of **National value** for natterjack toads.

5.7 INVERTEBRATES

Proposed Visitor Centre

A total of 86 terrestrial invertebrate species were recorded across the proposed Visitor Centre and car park site predominantly associated with tall sward, scrub and bare ground.

An additional S.41 species, dingy skipper was recorded during the NVC survey. 13 species (~15%) are regarded as locally common or locally scarce and the following 3 (~3%) notable species:

- *Amara curta* Dejean beetle Nationally Scarce
- *Orthochaetes setiger* weevil Nationally Scarce (Notable B)
- *Erynnis tages* dingy skipper Section 41 species of principal importance.

Assessment of Conservation Value

Despite finding some nationally scarce species, the site fails to meet Natural England's Species Quality Index (SQI) threshold to meet national level of importance. The results do however meet the criteria for a **District** level site of importance which describes populations of invertebrates or invertebrate habitats considered scarce or rare or threatened within the district¹⁹.

Nature reserve

In total 159 species of terrestrial invertebrate were identified by observation or collection and subsequent examination under a microscope. 129 of the species recorded (~81%) are without a status, being widely distributed and common, 26 species (~16%) are regarded as locally common or locally scarce, three (~2%) are currently accorded Nationally Scarce or Section 41 status and one is classed as data deficient:

- *Attactagenus plumbeus* weevil Notable;
- *Saprinus aeneus* beetle Nationally Scarce
- *Coenonympha nymphula* Section 41 priority species

- *Cernuella virgata* Data Deficient

Assessment of Conservation Value

Despite finding some nationally scarce species, the site fails to meet Natural England's Species Quality Index (SQI) threshold to meet national level of importance. The results do however meet the criteria for a **District** level site of importance which describes populations of invertebrates or invertebrate habitats considered scarce or rare or threatened within the district.

5.8 AMPHIBIANS

Proposed Visitor Centre

There were no great crested newts identified during the surveys and therefore confirmed likely/absent and the proposed Visitor Centre and car park site has **Negligible** value for GCN.

Common toads, common frogs and smooth newts were identified during every 2021/2022 amphibian survey visit and potential common toad tadpoles the April 2024 survey by RSPB therefore the value of the site for these receptors is **Local level**.

Nature reserve

There were no great crested newts identified during the surveys and therefore confirmed likely/absent and the nature reserve has **Negligible** value for GCN.

Common toads, common frogs and smooth newts were identified during every 2021/2022 amphibian survey visit and potential common toad tadpoles the April 2024 survey by RSPB. Therefore for the value of the nature reserve for these receptors are considered to be at **Local level**.

5.9 REPTILES

Proposed Visitor Centre

Common lizards were observed during every visit of the reptile survey with a peak count of 19 adults/sub-adults were recorded on the car park site during the survey visit on 17th May 2022. The density of reptile refugia was higher than the level required (10 refugia/per ha) to assess population numbers so this peak count has been adjusted to 8.3 common lizards to accurately assess population score. In accordance with the Key Reptile Register Scoring System²⁰ the site has a 'good' population score (peak counts 5-20 common lizards).

Common lizard are fairly widespread species in Cumbria, and thus the site is not of particular importance. The value of the proposed Visitor Centre area for reptiles is at the **Local level**.

Nature reserve

Common lizards were observed during every visit of the reptile survey with a peak count of 25 adults/sub-adults were recorded on the nature reserve during the survey visit on 19th May 2022. The

density of reptile refugia was higher than the level required (10 refugia/per ha) to assess population numbers so this peak count has been adjusted to 9.5 common lizards to accurately assess population score. In accordance with the Key Reptile Register Scoring System the site has a 'good' population score (peak counts 5-20 common lizards).

A peak count of 1 slow worm was observed on the nature reserve survey on the 24th May 2022 which in accordance with the Key Reptile Register Scoring System the site has a 'low' population score of slow worm.

Common lizard and slow-worm are fairly widespread species in Cumbria. The value of the nature reserve for reptiles is at the **Local level**.

5.10 BATS

The biological records search only identified three records of bats within 2km, two attributed to common pipistrelles and the other an unidentified bat roost within the town of Millom. Common pipistrelles are widespread and common in the UK.

Proposed Visitor Centre

The site is set within a dark landscape and the dense scrub and open grassland habitat support relatively diverse invertebrate prey species. These are good conditions for foraging and commuting bats. However the exposed nature of the site and a lack of continuous linear landscape features such as hedgerows and tree lines will reduce shelter for invertebrates and make foraging and flying relatively more difficult for bats.

The PEA assessed the majority of trees on site to be small and lacking in potential roost features and/or too densely growing for suitable bat roosting habitat. No potential roost features were identified although a detailed inspection was not undertaken. As such, bat surveys were not necessary to inform the designs of proposals.

The importance of the site for foraging and commuting bats is therefore **Local** at most and value for roosting bats is **Negligible**.

Nature reserve

The nature reserve has likely foraging and commuting habitat associated with scrub edges, over grassland and waterbodies where not too exposed to the coastal conditions. The varied habitat types, structure and species supports a diverse invertebrate prey assemblage for foraging bats.

The PEA identified that the majority of trees on site are likely to be small and lacking in potential roost features and/or too densely growing for suitable bat roosting habitat. However, potential roosting features are present among some of the mature trees on site.

The PEA also identified stone structures and cliffs on site have some potential for roosting bats (crevices could provide summer and/or winter roosting opportunities); however, the disused Towsey Hole Windmill and lighthouse are likely to be too exposed for roosting bats, being situated on the top of small hills on the coast.

It is likely that the bat species present are common and widespread species and therefore the importance of the site for roosting, foraging and commuting bats is **Local** at most.

5.11 BADGER

Proposed Visitor Centre

No evidence of any active badger setts were identified on site and relatively low evidence of badger foraging activity was found during the PEA visit. Likely badger foraging signs were found in grassland

and trails under a fence along the southern boundary of the site. Overall, setts are likely-absence and the importance of the site to support foraging badger is **Local** at most.

Nature reserve

The PEA identified a partially excavated (likely badger) hole in a large rubble bank near the electricity substation fairly central on site during a PEA visit. A badger pawprint was also seen along the northernmost perimeter. There were no active main setts on site and no evidence of badgers such as foraging or latrines on site. Whilst the dense scrub could not be surveyed, it was determined that frequent signs of activity, latrines and trails would have been identified if there was an active sett on site.

Overall, the sites importance for badgers is **Local** at most.

5.12 RIPARIAN MAMMALS

Proposed Visitor Centre

No evidence of otter activity was found to be present on site during PEA visit although a detailed otter survey was not undertaken as part of the PEA. There are no suitable waterbodies within this area to support otter however suitable sheltering habitat is present within the dense scrub. The surrounding lagoons, ponds and quarry support populations of fish and amphibians for foraging otter. The RSPB records do not have records of otters on the reserve and there is only one record of otter from 2008 approximately 1.5km north on the opposite side of Millom town; there is however anecdotal evidence of otter disturbing the terns once from the RSPB warden.

The levels of human disturbance and dogs are generally high and are likely to deter otter from seeking shelter on site. However, otter may occasionally visit the site when foraging/dispersing in the locality. Therefore, the site's importance for otter is **Local** at most.

Nature reserve

No evidence of otter activity was found to be present on-site during PEA visit. The lagoons and ponds support populations of fish and amphibians for foraging otter and suitable sheltering habitat is present within the dense scrub.

However, the levels of human disturbance and dogs are generally high and are likely to deter otter from seeking shelter on site. However, otter may occasionally visit the site when foraging/dispersing in the locality. Therefore, the site's importance for otter is **Local** at most.

5.13 INVASIVE SPECIES

There were small stands of Wall Cotoneaster (*Cotoneaster horizontalis*) identified within the calcareous grassland and scattered scrub mosaic and appeared to be spreading. Large and dense stands of wall cotoneaster were also present primarily in habitats within the north of the site, inclusive of calcareous

cliff habitats, walls of derelict buildings and adjacent to paths. This is one of the *Cotoneaster* species listed on Schedule 9 species as per the Wildlife and Countryside Act 1981 (as amended).

Nature reserve

Several species listed on Schedule 9 species as per the Wildlife and Countryside Act 1981 (as amended) were identified during the PEA including *Montbretia* sp., Japanese knotweed, *Cotoneaster* sp. Including wall *Cotoneaster*, small-leaved *Cotoneaster* (*Cotoneaster microphyllus*) and variegated yellow archangel. The variegated yellow archangel was present within verges surrounding and near the current car parking area in the north of the site; therefore, works may cause the species to spread when vehicles etc are entering/leaving the site.

Whilst sea buckthorn is not an invasive species as per Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), it is considered to be an invasive species in the northwest of England. This was found across the site despite efforts from RSPB to eradicate. Additionally, the reserves manager confirmed the presence of *Crassula helmsii* in ponds within the site during 2018-2020. This was a small infestation removed mechanically and monitoring is ongoing in order to ensure the complete eradication of this species in these ponds.

5.14 SUMMARY

The receptors summarised in the table below have been scoped in for further assessment on the basis of the above. Any receptors considered likely-absent, or of negligible importance are not considered further.

Table 5.12 Receptors scoped into EcIA

Receptors Scoped in to EcIA	Location	Importance
Morecambe Bay and Duddon Estuary, SPA, SAC, Ramsar	Nature reserve	International
Duddon Estuary SSSI	Nature reserve	National
Annex I habitats	Proposed Visitor Centre	International
	Nature reserve	International
S.41 Habitats	Proposed Visitor Centre	National
	Nature reserve	National
Notable plants	Proposed Visitor Centre	Regional
	Nature reserve	International
Breeding birds	Proposed Visitor Centre	Local/Site
	Nature reserve	International

Receptors Scoped in to EcIA	Location	Importance
Overwintering birds	Nature reserve	International
Invertebrates	Proposed Visitor Centre	District
	Nature reserve	National
Natterjack toads	Proposed Visitor Centre	National
	Nature reserve	National
Reptiles	Proposed Visitor Centre	Local
	Nature reserve	Local
Bats	Proposed Visitor Centre	Local
	Nature reserve	Local
Badger	Proposed Visitor Centre	Local
	Nature reserve	Local
Riparian mammals	Proposed Visitor Centre	Local
	Nature reserve	Local
Smooth newt, common frog, common toad	Proposed Visitor Centre	Local
	Nature reserve	Local

6.0 ASSESSMENT OF CONSTRUCTION IMPACTS

6.1 CONSTRUCTION ACTIVITIES

The construction activities are described for each of the two proposals, and an indication as to whether the actions have the potential to cause direct or indirect impacts.

Table 6.1 Impacts associated with the proposals

Description of activity	Impact
573,600m ² of habitat will be retained of which 42,400m ² of habitat will be enhanced	
The proposed Visitor Centre (and associated car parking)	
Loss of 4,117m ² of dense scrub habitat	Direct
Loss of 21m ² Priority Lowland Meadow habitat	Direct
Approximately 338m ² of hardstanding will be broken up and be used for Lowland Meadow compensation	Direct
Use of excavators, piling, compressors, generators and other plant creating disturbance through noise and vibration	Indirect
Works during night-time hours and site compounds requiring security measures, both of which may require external lighting	Indirect
Disturbance of soils potentially creating pollution events from dust deposition and subsequent surface run-off, nitrogen deposition from exhaust fumes from machinery	Indirect
Increased risk of habitat degradation and introducing/spreading of invasive species (<i>Cotoneaster</i> sp. present) through trampling outside of the red line boundary by construction workers and machinery	Direct
Works taking place across several months	Direct and Indirect
Nature reserve Proposals seek to narrow existing path networks and formalise desire lines. The zone of influence is considered to be within 20m of the path although it is acknowledged that noise and dust from site works may impact receptors at distances above 20m. Construction impacts associated with the development include	
Narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling, restrict access to vehicles allowing habitats under existing unofficial car parks to recover and habitats to expand	Direct
Exact machinery is yet to be determined, the typical equipment for road formations include dozers, delivery lorries, tracked excavators, twin drum vibrating roller, articulated dump truck, road paver, three point drum roller and wheeled backhoe loader. However, plant requirements are likely to be smaller and lighter than those required for larger scale road projects	Direct

Description of activity	Impact
The making good of the existing BOAT will involve the movement of ground materials, creation of bunds along the old sea wall and installing a roped pathway to allow habitats to recover. The construction machinery is yet to be determined however the contractors predict that the loudest machinery will be the vibrating roller which operates at 103dBA.	Indirect
Use of excavators, compressors, generators and other plant creating disturbance through noise and vibration	Indirect
Works during night-time hours and site compounds requiring security measures, both of which may require external lighting	Indirect
Increased risk of habitat degradation and introducing/spreading of invasive species (wall Cotoneaster, small leaved Cotoneaster, Montbretia sp., Japanese knotweed, variegated yellow archangel, and sea buckthorn are present at the site) through trampling by construction workers and machinery	Direct
Works taking place across several months	Direct and Indirect

The level of impact and significance for each ecological receptor in the absence of mitigation is provided in the sections below.

6.2 DESIGNATED SITES

Proposed Visitor Centre

The area proposed for the proposed Visitor Centre and car parking lies outside the designation boundaries. The qualifying species of the Ramsar and SPA sites are primarily seabirds, shorebirds and waders associated with the lagoon located at 200m from the proposed Visitor Centre and car parking area. None of the qualifying species of the Ramsar and SPA and habitats of the SAC have been recorded on site during the 2021-2022 surveys. The results of these surveys indicate that the site does not represent functional land used by species associated with the Ramsar and SPA.

Therefore, direct construction impacts of the proposed Visitor Centre and car park on the qualifying features are predicted to result in **Negligible (Not Significant) Effects**.

Given the proximity of the statutory site boundary, which lies immediately next to the development footprint, indirect impacts could be in the form of pollution events such as dust deposition, additional run-off, vibration and noise etc. Given the distance between the habitats supporting qualifying species (lagoon) and the nearest cited Annex 1 H2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) approximately 600m southwest)) it is unlikely that pollution events would impact the qualifying features for designation.

Therefore, impacts associated with construction of the proposed Visitor Centre and car park are predicted to result in **Negligible (Not Significant) Effects** on the qualifying features.

Nature reserve

The cited Annex 1 H2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) habitat will not be lost as a result of the formalisation of the paths and therefore no direct effects are predicted, **Negligible (Not Significant)**.

The formalisation of the paths could result in disturbance of the qualifying bird species using the adjacent lagoon through noise and artificial lighting (this is discussed further below). The Annex I H2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) habitat and the lagoon which supports the qualifying populations of birds could also be subject to habitat degradation through pollution events as well as trampling and spreading of invasive species (discussed in respective sections below). This would result in a **Temporary to Permanent, Negative (Significant) Effect at an International Scale**.

6.3 HABITATS

Proposed Visitor Centre

The site selection of the proposed Visitor Centre and car park have targeted lower distinctiveness and easily recreated dense scrub habitats which are widespread and common in Cumbria. The mitigation hierarchy has been followed to avoid the internationally important Annex I habitat.

Nonetheless, 21m² of regionally important Priority Lowland Meadow habitat will be lost to facilitate an access road to the new car park resulting in a **Permanent Negative (Significant) Effect at a Regional scale**. This option was considered to be the least impactful and Natural England has been consulted throughout this decision process.

The NVC report states that terrestrial habitats of high floristic importance are particularly prone to eutrophication. Indirect impacts during construction include pollution events, increased surface run-off, dust deposition, nitrogen deposition from machinery and direct impacts trampling from construction workers degrading habitat and spreading invasive species. The Annex I habitats on site are not cited within the SAC designation however the habitat is internationally protected and therefore the indirect impacts could result in a **Temporary Negative (Significant) Effect at an International scale**. The scale of the impacts on the remaining priority habitats on site could result in a **Temporary Negative (Significant) Effect at a National scale**.

As a result of the proposals hardstanding will be broken up and given back to nature which will increase the opportunity for sensitive habitats to expand. This will result in a **Permanent, Positive (Significant) Effect at a Regional to National Scale**.

Nature reserve

No protected or notable habitats will be lost to facilitate the development. However, indirect impacts during construction include pollution events listed in the section above which could cause changes to the chemical composition of the habitat and plant communities as well as direct impacts from trampling

from construction workers and machinery degrading habitat and spreading invasive species. The habitat degradation of the Annex I habitats could result in a **Temporary Negative (Significant) Effect at an International scale**. Impacts to the remaining priority habitats on site would result in a **Temporary Negative (Significant) Effect at a National scale**.

6.4 NOTABLE PLANTS

Proposed Visitor Centre

The mitigation hierarchy has been followed during visitor and car parking site selection and designs have avoided the internationally important habitats within this area. Nonetheless, 21m² of regionally important Priority Lowland Meadow home to notable plant species is required to facilitate the access road towards the new car park. As described above within the notable habitats section, this strategy is considered the least impactful and Natural England were included within the consultations for the selection of this strategy. The NVC survey identified the following notable plants, either forming part of the habitat within the 16m² or are immediately adjacent to the area proposed for removal:

- Fern grass (High Regional Importance);
- Carline thistle (Locally Important);
- Wild strawberry (Locally Important);
- Quaking grass (Locally Important); and
- Eye bright (Locally Important).

Each species exists within a wider community of itself which is taken into consideration when assessing impact. The loss of fern grass will result in a **Permanent, Negative (Not Significant) Effect at a Regional scale** as the loss is a small part of the wider resource on site. Carline thistle, wild strawberry, quaking grass and eye bright are all locally important plant species and therefore the removal of these would result in a **Permanent, Negative (Not Significant) Effect at a Local scale** as the loss is a small area amongst the wider abundance on site.

Through following the mitigation hierarchy and avoiding sensitive habitats, the majority of notable plants will be retained which include those listed above as well as:

- Wild marjoram (High Regional Importance); and
- Common cudweed (High Regional Importance).

In the absence of mitigation however, the construction phase of the development could result in disturbance through trampling, dust deposition, pollution events and additional runoff which could result in a **Temporary, Negative (Not Significant) Effect at a Local and Regional scale**.

The proposals seek to narrow the existing road into the width of a footpath and therefore expanding the opportunities for these plants to grow. This will result in a **Permanent, Positive (Not Significant) Effect at a Local and Regional scale** at the proposed Visitor Centre and car park site.

Nature reserve

No habitat removal is proposed to facilitate the formalisation of paths and therefore, direct effects on notable plants are **Negligible (Not Significant)**.

In the absence of mitigation however, the construction phase of the development could result in direct disturbance through trampling from site workers and indirect disturbance from dust deposition, pollution events and additional runoff which could result in a **Negative (Significant) Effect at a Local, Regional and International scale**.

6.5 BREEDING BIRDS

Proposed Visitor Centre

Direct disturbance of nesting qualifying species for the SPA, Ramsar and SSSI is unlikely as these are not likely to nest within the habitats within this location and are known to favour the purpose-built slag islands located approximately 600m (gull island) and 860m (tern island) south-west of the proposed Visitor Centre and car park footprint. In direct disturbance from noise, vibration and pollutant spillage is not anticipated to impact the breeding colonies given the distance. Overall, in the absence of mitigation during the construction phase, the effects on the qualifying breeding bird species and other breeding seabirds within the lagoon are **Negligible (Not Significant)**.

Scrub clearance will be required to facilitate the development of the building and car park. Without appropriate mitigation, the activities undertaken at the construction stage, in particular site clearance, could result in the killing and/of injury of common nesting birds and destruction of nests. Therefore, in the absence of mitigation the construction phase of the development could result in a **Negative (Significant) Effect within the Zone of Influence only** common passerine birds.

There will be a loss of scrub nesting habitat available due to the development. Scrub habitat is common and widespread in the locality and the loss which is therefore will result in a **Permanent, Negative (Not Significant) Effect within the Zone of Influence only** for common passerine birds.

Nature reserve

Scrub clearance will be required to facilitate the creation of a new footpath and ponds and also for the construction of surface water attenuation swales and pipes etc. in the northern part of the reserve. Without appropriate mitigation, this work could result in the killing and/of injury of common nesting birds and destruction of nests. Therefore, in the absence of mitigation the construction phase of the development could result in a **Negative (Significant) Effect within the Zone of Influence** on common passerine birds.

In the absence of mitigation, construction activities associated with formalising the paths on site, in particular the BOAT along the seawall, the restoration of the existing bird hide and the creation of the hide on the old sea wall has potential to indirectly disturb the qualifying species, breeding tern and gull colonies and Schedule 1 species of birds in the form of increased noise, vibration and pollution events.

Of the qualifying species, common tern, sandwich tern and little tern are known to have medium to high susceptibility to human disturbance within the breeding season²¹ which can lead to colonies abandoning their nests and cause colonies to move and decrease breeding success. Recommended buffer distances for human disturbance during the breeding season is considered to range from 100-400m for tern species²². There is limited research on the recommended buffer zones for breeding colonies of Herring gulls and lesser black-backed gull's perhaps due to the fact they are known to nest in heavily urban environments.

Additionally, studies undertaken by Wright et al. (2010), Dooling and Popper (2007) and Cutts et al. (2009) suggest changes in bird behaviour and flight abandonment can begin to occur at chronic noise levels of 55-65dBA, with sudden irregular noise above 50dBA causing the most disturbance. The studies also showed that ambient construction noise levels should be restricted to below 70dBA as birds will habituate to regular noise below this level. The exact machinery for the works is yet to be determined however the contractors predict that the loudest machinery will be the vibrating roller which operates at 103dBA at source.

Therefore, behavioural changes and flight abandonment of the site by all qualifying bird species present may be caused by the following site activities, depending on the location of the noise generation in relation to the birds:

- De-vegetation activities and any required clearance activities
- excavation, handling, removal and treatment of any arisings
- activities using plant or loud hand tools
- activities that cause sudden, loud noises

Overall, in the absence of mitigation the indirect impacts of construction associated with formalising the paths along the sea wall, restoring the existing bird hide and building the hide on the old sea wall is likely to have a **Temporary, Negative (Significant) Effect** at an **International Level** on qualifying breeding birds.

6.6 OVERWINTERING BIRDS

Proposed Visitor Centre

Direct disturbance of qualifying species for the SPA, Ramsar and SSSI is unlikely as these are none are known or are likely to roost and forage within the proposed Visitor Centre and car park footprint. The overwintering birds use the lagoon habitat which the closest point lies 0.2km south-east and at its furthest the edge of the lagoon lies over 1.2km away from the proposed Visitor Centre and car park footprint. The recommended buffer zones for human disturbance for each species of overwintering birds is located in Table 6.2 in the section below and ranges from between 0.2km-1km. Therefore, in direct disturbance from noise is not anticipated to impact the overwintering assemblages given the acoustic attenuation of construction related noise at these distances.

Furthermore, given the physical distance, other indirect impacts from vibration and pollutant spillage are not anticipated. Overall, in the absence of mitigation the construction phase, the effects on the qualifying overwintering bird species within the lagoon are **Negligible (Not Significant)**.

There will be a loss of scrub foraging and sheltering habitat for common passerine birds available due to the development. Scrub habitat is common and widespread in the locality and the loss will therefore result in a **Permanent, Negative (Not Significant) Effect** within the **Zone of Influence** for common passerine birds.

Nature reserve

There will be no habitats that support overwintering birds lost to the development. Therefore, direct effects are **Negligible (Not Significant)**.

Nonetheless, In the absence of mitigation, construction associated with formalising the paths on site, in particular the BOAT along the seawall, restoration of the existing bird hide and construction of the hide along the old sea wall has potential to indirectly disturb the qualifying species through a range of pathways including noise, vibration and pollutant spillage. Disturbance from long-term construction works are known to impact several of the overwintering bird species present²³. Disturbance can have negative physiological costs such as increased heart rate and stress hormones as well as negative energetic costs from the reduced foraging time or flying away from the site of disturbance. Please refer to section 5.5 above for information on likely noise levels from construction activities and disturbance impacts on birds, which are also of relevance to wintering birds.

Below is a table of the recommended buffer zones for the Qualifying and red list species at the site²⁴.

Table 6.2 recommended buffer zones for the Qualifying and red list species at the site

Species	Conservation Status	Overall sensitivity to disturbance	Recommended buffer zones in Non-breeding season
Black-tailed Godwit (<i>Limosa limosa</i>)	Red LBAP Qualifying species for SPA designation	Medium	100-200m
Curlew (<i>Numenius arquata</i>)	Red LBAP Qualifying species for SPA designation	High	200-650m
Dunlin (<i>Calidris alpina alpina</i>)	Red Qualifying species for SPA designation	Medium	150-300m
Ringed plover	Red list	High	100-300m

Species	Conservation Status	Overall sensitivity to disturbance	Recommended buffer zones in Non-breeding season
	Qualifying species for SPA designation		
Goldeneye (<i>Bucephala clangula</i>)	Red	High	150-800m
Pochard (<i>Aythya ferina</i>)	Red	High	150-450m
Scaup (<i>Aythya marila</i>)	Red LBAP	High	150-450m
Slavonian Grebe (<i>Podiceps auritus</i>)	Red	Medium	150-350m
Bar-tailed Godwit (<i>Limosa lapponica</i>)	Amber Qualifying species for SPA designation	Medium	200-300m
Oystercatcher	Amber Qualifying species for SPA designation	Medium	150-300m
Grey Plover (<i>Pluvialis squatarola</i>)	Amber Qualifying species for SPA designation	Medium	150-300m
Knot (<i>Calidris canutus</i>)	Amber Qualifying species for SPA designation	Medium	100-300m
Mediterranean Gull (<i>Larus melancephalus</i>)	Amber Qualifying species for SPA designation	Low ²⁵	100m*
Redshank (<i>Tringa totanus</i>)	Amber Qualifying species for SPA designation	Medium	200-300m
Sanderling (<i>Calidris alba</i>)	Amber Qualifying species for SPA designation		69m ²⁶
Turnstone (<i>Arenaria interpres</i>)	Amber Qualifying species for SPA designation		72m ²⁶
Whooper Swan (<i>Cygnus cygnus</i>)	Amber	Medium	200-600m

Species	Conservation Status	Overall sensitivity to disturbance	Recommended buffer zones in Non-breeding season
	Qualifying species for SPA designation		
Black-throated Diver (<i>Gavia arctica</i>)	Amber LBAP	High	<1000m
Little Egret	Green Qualifying species for SPA designation		107m ²⁶

*No buffer zones were identified during research, however gull's sensitivity to human disturbance is considered low and therefore the lower end of the buffer range for other species is considered acceptable for gulls.

The majority of the buffer zones have been taken from NatureScot's literature review of disturbance distances of selected bird species and the 'human disturbance' covers activities such as pedestrian walking to a motorboats out at sea. Works to the old sea wall would fall within 15m of the lagoon which lies well below the lower threshold recommended for buffer zones. The impact of disturbance on the populations of birds that whole sites can support, however, depends upon the availability of alternative habitat²⁷. The lagoon forms a total of 50.24ha and the width of the lagoon varies between approximately 850m-1,300m across and forms a part of the wider Duddon Estuary and therefore birds have ample space to avoid construction without leaving the lagoon.

Nonetheless, in the absence of mitigation however, the scale of the impacts on overwintering bird will have a **Temporary, Negative (Significant) Effects at an International level**.

6.7 NATTERJACK TOADS

Proposed Visitor Centre

The proposals will not result in the loss of any potential natterjack toad breeding pools. Additionally, the scrub clearance will not result in the loss of any foraging or commuting habitat which is too scrubbed/wooded over for this species. Whilst surveys confirmed likely-absence of natterjack toads within the development footprint of the proposed Visitor Centre and associated car parks, anecdotal evidence of a Natterjack was provided to PEA surveyors suggesting occasional and sporadic use and a known breeding pond lies 0.57km north-east of the proposed works along the BOAT on the main reserve and adult males were heard calling on two occasions from nearby coastal floodplain & sheep grazed marshland 0.5km south east.

Given the proximity of works to confirmed areas supporting natterjacks and the presence of an occasional transient/opportunistic natterjack using the site at certain times when dispersing/foraging cannot be entirely ruled out. This is supported by the desktop data which evidences biological records of

natterjack toad seen on site. Without due care and consideration there is therefore a potential risk for the killing or injuring natterjack toad as a result of the construction activity on site.

The potential impact on natterjack toads during the construction phase of the development is therefore will have a **Negative (Significant) Effect at the National scale.**

Nature reserve

Whilst the surveys confirmed likely absence of natterjack toads on site. Three adult natterjack toad were encountered within approximately 40m from the site boundary north-west also a location where natterjack males have been heard calling over two years of surveys when the area holds water.

Therefore, given the proximity of works to confirmed areas supporting natterjacks and the presence of an occasional transient/opportunistic natterjack using the site at certain times when dispersing/foraging cannot be entirely ruled out. This is supported by the desktop data which evidences biological records of natterjack toad seen on site. Without due care and consideration there is therefore a potential risk for the killing or injuring natterjack toad as a result of the construction activity on site.

The potential impact on natterjack toads during the construction phase of the development is therefore will have a **Negative (Significant) Effect at National scale.**

6.8 REPTILES

Proposed Visitor Centre

In the absence of mitigation, site clearance in this area has the potential to result in the killing and injury of reptile species (common lizard) within the application site. This would almost certainly result in a **Negative (Significant) Effect within the Zone of Influence only.**

Nature reserve

The habitat that will be impacted by formalised pathways are existing desire lines and subject to frequent trampling, therefore reptiles are unlikely to be within these areas. However, given the confirmed presence of reptiles within the immediate vicinities, dispersing/foraging cannot be ruled out. Without due care and consideration there is therefore a potential risk for the killing or injuring reptiles as a result of the construction activity on site. Therefore, the effect is thought to be **Negative (Significant) Effect within the Zone of Influence only.**

The proposals narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling, restrict access to vehicles allowing habitats under existing unofficial car parks to recover and these habitats will be given back to nature providing more opportunities for reptiles resulting in a **Positive, Permanent, (Significant) Effect at Zone of Influence only.**

6.9 INVERTEBRATES

Proposed Visitor Centre

The invertebrate report identified two important factors in maintaining invertebrate interest at a site are habitat continuity and variation in structure and will be maintained. The construction will not result in any habitat fragmentation. There will be a loss of scrub and loss of lowland meadow is proposed to facilitate the development however the site is set within a wider expanse of both these habitats. This will result in a **Temporary, Negative (Insignificant) Effect within the zone of influence only.**

The proposals will give 388m² of hardstanding will be given back to nature providing more opportunities for invertebrates resulting in a **Permanent, (Significant) Effect at District level.**

Nature reserve

Whilst the majority of habitat lost across the site will be those associated bare ground, hardstanding and those subject to heavy trampling there will be some scrub habitat cleared. Therefore, the effect will be **Temporary, Negative (Insignificant) Effect within the zone of influence only.**

The proposals narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling, restrict access to vehicles allowing habitats under existing unofficial car parks to recover and these habitats will be given back to nature providing more opportunities for invertebrates. Retained habitats and additional natural habitats will be created as a result of the development which will retain the structural diversity and connectivity to the wider landscape and result in a **Permanent, Positive (Significant) Effect at District Level.**

6.10 BATS

Proposed Visitor Centre

Whilst detailed surveys have not been undertaken to establish the presence/likely absence of roosting bats on site given the general unsuitability of the visible trees on site. It is likely that the remaining trees are of similar limited value.

However roosting bats could be impacted should the clearance of trees/scrub involve clearance of trees with roosting features. Site clearance therefore has the potential to result in the killing and injury of bats, and loss of roosts/potential roosts. In the absence of mitigation these impacts would almost certainly have a **Negative (Significant) Effect at the Local scale.**

Nature reserve

Whilst scrub and trees visible were generally unsuitable for roosting bats, roosting bats could be impacted should the clearance of trees/scrub involve clearance of trees with roosting features. Site clearance therefore has the potential to result in the killing and injury of bats, and loss of

roosts/potential roosts. In the absence of mitigation these impacts would almost certainly have a **Negative (Significant) Effect at the Local scale.**

6.11 BADGERS

Proposed Visitor Centre

No further surveys were recommended as habitats of value for foraging will be compensated. Whilst there may be a reduction in habitat available for foraging whilst habitat compensation is establishing, there is ample foraging habitat available in the wider context.

It was not possible to inspect the dense scrub for badger setts/signs during the PEA and therefore the presence of a sett in the dense scrub cannot be entirely ruled out. Scrub clearance and excavation works therefore have the potential to result in destruction of setts/harm to badgers. In the absence of mitigation, these impacts would have a **Negative (Significant) Effect at the Local scale.**

Nature reserve

A partially excavated (likely badger) hole was noted in a large rubble bank near the electricity substation during a PEA visit which lies approximately 32m away from the BOAT and therefore outside the zone of impact. Therefore, direct effects on badgers are **Negligible (Not Significant).**

It was not possible to inspect the dense scrub for badger setts/signs during the PEA and therefore the presence of a sett in the dense scrub cannot be entirely ruled out. Scrub clearance and excavation works therefore have the potential to result in destruction of setts/harm to badgers. In the absence of mitigation, these impacts would have a **Negative (Significant) Effect at the Local scale.**

During the construction phase lighting, construction noise/ vibration activities, storage of chemicals, felling of trees and creation of trenches/ excavations pose a temporary threat to badger. Given all of the above factors the predicted impact on badger is likely to lead to a **Temporary, Negative (Not Significant) Effect within the Zone of Influence only.**

The proposals narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling, restrict access to vehicles allowing habitats under existing unofficial car parks to recover and these habitats will be given back to nature providing more foraging opportunities for badgers resulting in a **Permanent, Positive (Not Significant) Effect within the Zone of Influence only.**

6.12 RIPARIAN MAMMALS

Proposed Visitor Centre

During the dense scrub clearance, otters or otter holts or natal dens could be identified which could result in killing, injury, or disturbance of otters and damage or destroy their breeding sites and resting places. This will result in a **Negative (Significant) Effect at a Local Level.**

During the construction phase lighting, construction noise/ vibration activities, storage of chemicals, felling of trees and creation of trenches/ excavations pose a temporary threat to otters and is likely to lead to a **Temporary, Negative (Significant) Effect at a Local level**.

Nature reserve

No further surveys were recommended as the majority of habitats of value for foraging and sheltering will be retained throughout the development and therefore effects are **Negligible (Not Significant)**.

During the small pockets of dense scrub clearance, otters or otter holts or natal dens could be identified which could result in killing, injury, or disturbance of otters and damage or destroy their breeding sites and resting places. This will result in a **Negative (Significant) Effect at a Local Level**.

During the construction phase indirect impacts such as lighting, construction noise/ vibration activities, storage of chemicals, felling of trees and creation of trenches/ excavations pose a temporary threat to otters and is likely to lead to a **Temporary, Negative (Significant) Effect at a Local level**.

6.13 HEDGEHOG

Proposed Visitor Centre

Whilst further survey to establish the presence/likely absence of hedgehog from development sites is not a requirement in the UK, the site has been assessed as having a high potential to support this species. Hedgehogs are a priority species, and without mitigation the clearance of the site may lead to the killing or injuring of hedgehog, which is likely to be in breach of the Wild Mammals (protection) Act 1996. This would be a **Negative (Significant) Effect within the Zone of Influence only**.

Nature reserve

The site has been assessed as having a high potential to support this species. Therefore, without mitigation the clearance of scrub in the northern part of the site may lead to the killing or injuring of hedgehog, which should be avoided.

This would be a **Negative (Significant) Effect within the Zone of Influence only**.

7.0 ASSESSMENT OF OPERATIONAL IMPACTS

7.1 OPERATIONAL ACTIVITIES

The operational activities are described for each of the two proposed developments, and an indication as to whether actions have the potential to cause direct or indirect impacts.

Table 7.1 Description of operational impacts

Description of activity	Impact
Proposed Visitor Centre (and associated car parking) where operational impacts associated with the development include:	
An increase in the numbers of visitors annually increasing recreational pressure on site	Direct
Increase risk in eutrophication of habitats associated with nitrogen deposition from increase in cars using the car park and increase dog faeces from an increase in dogwalkers	Direct
Increased risk of habitat degradation through trampling, littering, dog foul and spreading of invasive species	Direct
Increase surface run-off through increase in building/hardstanding and foul water on site	Direct
30 years of habitat management secured for the site	Direct
The nature reserve where operational impacts associated with the development include	
Increase in visitors from 40,000 annually to 80,000 visitors annually increasing recreational pressure on site. The recreational pressure increases risk of habitat degradation through trampling from footfall, littering, dog foul and spreading of invasive species	Direct
The restriction of vehicular access along the BOAT to emergency and maintenance vehicles only and the unofficial car parks will cease to exist, natural space can expand and provide opportunities for habitats to recover and expand	Direct
Increased risk of visual disturbance of breeding and overwintering birds within the Zol (up to 1km) along the BOAT	Direct
Proposals will bring long-term management to the site for a period of at least 30 years	Direct

7.2 DESIGNATED SITES

Proposed Visitor Centre

The provision of a Visitor Centre and additional car parking will increase the number of site users to this area of the site. Given the distance from the qualifying features associated with the lagoon and the Annex I H2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) habitat is predicted to have a **Negligible (Not Significant)** effect on the reasons for designation.

The proposed Visitor Centre and car parking will increase levels of surface run-off and foul water will require removal from site. The proposed strategy for surface water drainage from car park and building will go via attenuation/treatment tanks under the car park and coach park area before discharging into the old Red Hills quarry off-site to the North via a drain laid in the existing access road to the Household Waste Recycling Centre. There will therefore be no surface water discharge into Hodbarrow lagoon. The foul drainage will be pumped from the site by a shared service trench along the access road back to Mainsgate Road to join an existing United Utilities drain.

It is understood that the runoff will be controlled, reduced and treated appropriately and is predicted to effect the hydrology of the lagoon and the opportunities for foraging and the qualifying species that use. The drainage report²⁸ concludes that "the change to a point discharge is not considered to adversely impact the waterbodies." Overall, the effect will be **Negligible**.

In the absence of mitigation, the effect of the increase in recreational pressure would be human disturbance to qualifying species as well as degradation to qualifying habitats through activities such as additional footfall, littering and invasive species introduction. Therefore, the operational phase of the development could result in a **Permanent, Negative (Significant) Effect** at an **International scale** at the proposed Visitor Centre and car park site.

Nature reserve

In the absence of mitigation, the effect of the increase in recreational pressure would be human disturbance to qualifying species as well as degradation to qualifying habitats through activities such as additional footfall, littering and invasive species introduction. Therefore, the operational phase of the development could result in a **Permanent, Negative (Significant) Effect** at an **International scale**.

7.3 HABITATS

Proposed Visitor Centre

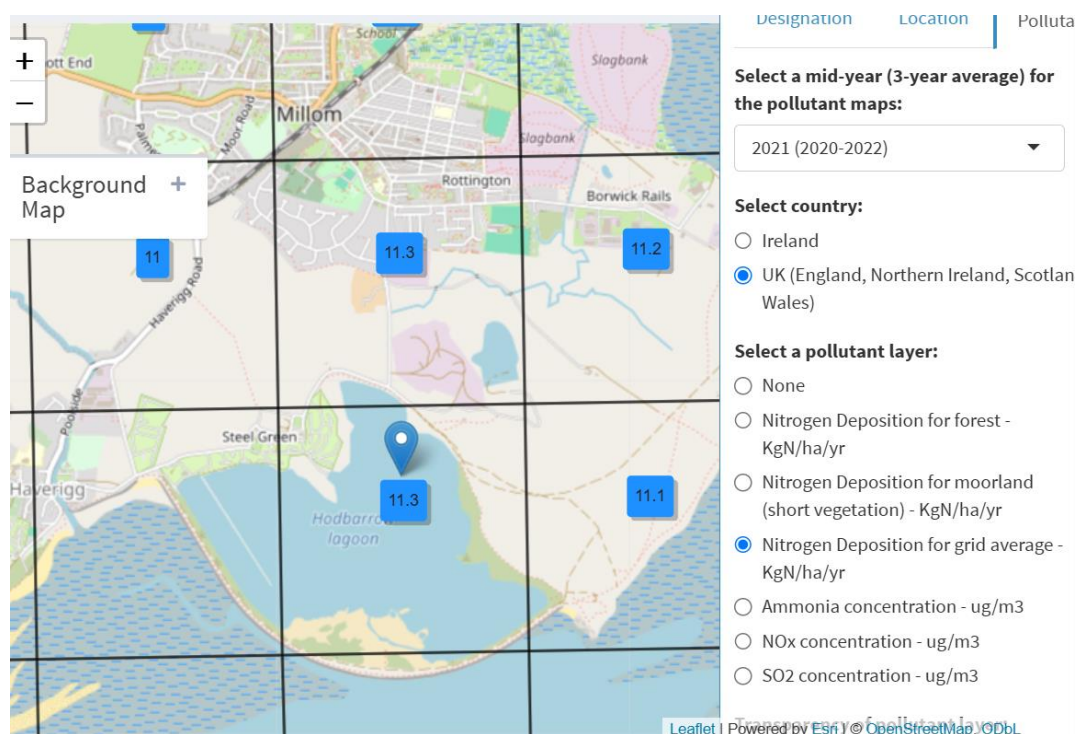
The increase in recreational pressure could result in habitat degradation on the habitats on site through trampling from footfall, introduction of invasive species, increase in fly tipping resulting in a **Permanent, Negative (Significant) Effect** at a **National to International scale**.

The increase in recreational pressure could also result in habitat degradation as a result of eutrophication of the retained Annex I and priority habitat through dog faeces and reactive nitrogen deposition from cars parking at the proposed Visitor Centre.

Exceedance of critical values airborne of nitrogen oxides (NO_x) may modify the chemical status of the habitats' substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with the habitat. Consultation with Air Pollution Information System (APIS)²⁹ interactive map identifies the proposed Visitor Centre area has a 3-year average of 11.3 Nitrogen Deposition KgN/ha/yr (see

Figure 7.1). The site falls partially within a quadrat that includes Millom town centre. The car park provides space for 63 cars (however 6 of these are Electric Vehicle charging points which will not contribute) to NO_x emissions. It is unlikely that the levels of cars using the car park will exceed the levels of car activity within the town centre. Calcareous grassland's critical load is 15–25 kg N ha⁻¹ yr⁻¹¹³⁰ and Lowland meadows critical load is between 20-30 kg N ha⁻¹ year⁻¹¹³¹ therefore, the increase in cars is not expected to reach the minimum threshold for these grasslands.

Figure 7.1 3-year average of Nitrogen Deposition KgN/ha/yr



In the absence of mitigation, this will result in a **Permanent, Negative (Not Significant) Effect** at a **National to International scale**.

The proposals will bring long-term management to the site for a period of at least 30 years. This will result in a **Permanent, Positive (Significant) Effect** at a **Regional, National, and International scale**.

Nature reserve

The restriction of vehicular access along the BOAT to emergency and maintenance vehicles only and the unofficial car parks will cease to exist, natural space can expand and provide opportunities for

habitats to recover and expand. This will result in a **Permanent, Positive (Significant) Effect at a Regional, National and International scale.**

The increase in recreational pressure could result in habitat degradation through trampling from footfall, introduction of invasive species, increase in fly tipping and increase in eutrophication through dog faeces. In the absence of mitigation, this will result in a **Permanent Negative (Significant) Effect at an International scale.** Impacts to the remaining priority habitats on site would result in a **Permanent Negative (Significant) Effect at a National scale.**

The proposals will bring long-term management to the site which will result in a **Permanent, Positive (Significant) Effect at a Regional, National, and International scale.**

7.4 NOTABLE PLANTS

Proposed Visitor Centre

The increase in recreational pressure could result in disturbance and killing of notable plants on site through trampling from footfall, introduction of invasive species outcompeting for resources, increase in eutrophication through dog faeces and reactive nitrogen deposition from cars parking at the proposed Visitor Centre. In the absence of mitigation, this will result in a **Permanent Negative (Significant) Effect at a Local and Regional scale.**

The proposals will bring long-term management which will result in a **Permanent, Positive (Significant) Effect at a Regional and National scale.**

Nature reserve

The increase in recreational pressure could result in habitat degradation on the habitats on site through trampling from footfall, introduction of invasive species, increase in fly tipping and increase in eutrophication through dog faeces. In the absence of mitigation, this will result in a **Permanent Negative (Significant) Effect at a Local, National and International scale.**

The proposals will bring long-term management to the site for a period of at least 30 years. This will result in a **Permanent, Positive (Significant) Effect at a Regional and National scale.**

7.5 BREEDING BIRDS

Proposed Visitor Centre

Operational

The increase in vehicles and pedestrians to the proposed Visitor Centre and car park will have a **Negligible (Not Significant) Effect** on qualifying species of the designations given the distance from the lagoon.

The presence of a Visitor Centre and car park is predicted to increase the numbers of visitors to the nature reserve. The effects of this are described in the nature reserve operational impact assessment below.

Nature reserve

Proposals estimate peaks of 100 visitors per hour over the course of a day during peak periods (school holidays, warm weather); currently visitor numbers at these times are estimated to be 50 people per hour. The increase in visitors has potential to increase the frequency of human disturbance to breeding terns and gulls. This can affect the breeding success of birds in a variety of ways including reduced intake of food, increased energy expenditure, physiological impacts such as increased stress and direct impact through predation by domestic dogs.

The 0.5ha tern island was created within 100m of the existing BOAT, which lies closer than the recommended human disturbance buffer zones for tern species (ranging from 200-400m)³². Given that successful breeding colonies can exist within this range is likely due to a combination of the following:

- presence of a tern warden during the breeding season protecting the terns from disruptive behaviour by site users;
- creation of a bund which screens the majority of movement by site users from the terns;
- presence of anti-predator fencing;
- the terns have likely developed some level of habituation to human disturbance; and
- existing site users are aware of the importance of the tern colonies and respectfully adhere to rules.

All of these factors contributing to breeding success will continue alongside the implementation of the proposals. Nonetheless, in the absence of mitigation, the increase in visitors could result in a **Permanent Negative (Significant) Effect at an International Level**.

There is less available information on the impacts of human disturbance on breeding herring gulls and lesser back backed gulls perhaps due to the fact they are known to nest in heavily urban environments indicating they may have a higher tolerance towards human disturbance. As a precaution, in the absence of mitigation, the increase in visitors could result in a **Permanent Negative (Significant) Effect at an International Level**.

7.6 OVERWINTERING BIRDS

Proposed Visitor Centre

The increase in vehicles and pedestrians to the proposed Visitor Centre and car park will have a **Negligible (Not Significant) Effect** on qualifying species of the designations given the distance from the lagoon.

The presence of a Visitor Centre and car park is predicted to increase the numbers of visitors to the nature reserve. The effects of this are described in the nature reserve operational impact assessment below.

Nature reserve

The site is already subject to some disturbance from site users however the proposals will seek to increase visitors which is predicted to equate to 410 people each day if spread evenly across the year. The buffer zones for human disturbance for the non-breeding bird species range from 200m to 1000m (see Table 6.2). The lagoon forms a total of 50.24ha and there is approximately 850m-1,300m across. Therefore, there would be areas of the lagoon available to all species if they were to avoid humans. Nonetheless, in the absence of mitigation, the increase in visitors could result in a **Permanent Negative (Significant) Effect** at an **International Level**.

7.7 NATTERJACK TOADS

Proposed Visitor Centre

The proposed Visitor Centre and car park site will remain unsuitable for natterjack toads post development. The proposed Visitor Centre and car park will be closed to the public during times when natterjacks may be dispersing or foraging and therefore risk of injury or death of natterjacks as a result of cars in this area is unlikely. There may be occasions where private functions have hired out the venue during the evenings when natterjacks could be dispersing, however given the unsuitability of the car parks and roads as habitat for natterjacks and the no known migratory routes in this area the likelihood of this occurrence is very low.

Overall, the operational phase of this area of development will have a **Negligible (Not Significant) Effect**.

Nature reserve

Existing habitat suitable for natterjack toads will be managed on site as part of the proposals, such as scrub clearance and fencing of ponds to reduce disturbance and degradation by dogs with the aim of retaining suitable breeding habitat for this species on site.

However, the increased number of visitors could increase opportunities for disturbance of natterjacks by people and dogs, in particular dogs entering ponds. Dogs entering ponds can increase turbidity of the pond and leach chemicals from flea treatments which could alter the pH of the pond and ultimately make it less suitable.

There are no other predicted impacts on natterjack's during the operational phase of the development. Therefore, the impact is thought to be **Permanent, Negative (Significant) Effect** at a **National scale**.

7.8 REPTILES

Proposed Visitor Centre

Increased number of visitors could increase opportunities for disturbance of reptiles by people and dogs with potential increased predation by dogs. Overall, the operational phase of this area of development will have a **Permanent (Not Significant) Effect at a Local Scale**.

Nature reserve

Increased number of visitors could increase opportunities for disturbance of reptiles by people and dogs with potential increased predation by dogs. Overall, the operational phase of this area of development will have a **Negligible (Not Significant) Effect at a Local Scale**.

7.9 INVERTEBRATES

Proposed Visitor Centre

Retained habitats and additional natural habitats will be created as a result of the development which will retain the structural diversity and connectivity to the wider landscape. The development ensures the long-term management commitment to habitats that would otherwise scrub over and result in a homogenous habitat of less value for invertebrates. Therefore, it is anticipated that proposal will have a **Permanent, Positive (Significant) Effect at District Level**.

Nature reserve

The development ensures the long-term management commitment to habitats that would otherwise scrub over and will create more open habitats of benefit to invertebrates. Therefore, it is anticipated that proposal will have a **Permanent, Positive (Significant) Effect at National Level**.

7.10 BATS

Proposed Visitor Centre

No further surveys were recommended as habitats of value for foraging will be compensated. However, in the absence of mitigation a lighting scheme with increased, uncontrolled upward light spill could however result in a **Permanent Negative (Insignificant) Effect upon foraging or commuting bats at a Local scale**.

Nature reserve

No further surveys were recommended as habitats of value will be retained and enhanced, additionally proposals seek to retain the dark landscape of the nature reserve and do not propose any lighting. Therefore, there are no predicted impacts on bats during the operational phase of the development. Therefore, the effect is thought to be **Negligible (Not Significant)**.

7.11 BADGERS

Proposed Visitor Centre

There are no predicted impacts on badgers during the operational phase of the development. Therefore, the effect is thought to be **Negligible (Not Significant)**.

Nature reserve

There are no predicted impacts on badgers during the operational phase of the development. Therefore, the effect is thought to be **Negligible (Not Significant)**.

7.12 RIPARIAN MAMMALS

Proposed Visitor Centre

No impacts to riparian mammals are predicted from the operation of the proposed Visitor Centre given its distance from riparian habitat.

Nature reserve

The proposals predicted to increase the numbers of visitors and otters are a secretive species and are deterred by human disturbance. This site is already subject to human disturbance which may explain the little evidence of otters using the site. Overall, given the infrequency of the site by otter, the increase in visitors may have a **Permanent, Negative (Not Significant) Effect at a Local level**.

7.13 HEDGEHOG

Proposed Visitor Centre

There are no predicted impacts on hedgehog during the operational phase of the development. Therefore, the effect is thought to be **Negligible (Not Significant)**.

Nature reserve

There are no predicted impacts on hedgehog during the operational phase of the development. Therefore, the effect is thought to be **Negligible (Not Significant)**.

8.0 CONSTRUCTION MITIGATION AND COMPENSATION MEASURES

This section describes the mitigation and compensation measures recommended for construction phase of the development. Ecological receptors where 'negligible' impact is predicted are not considered within this section.

8.1 GENERAL BEST PRACTICE

Ecological Clerk of Works (ECoW)

An ECoW will be present to oversee works throughout key phases and activities deemed to have highest risk for ecological receptors. On days not deemed necessary for ECoW presence, the ecologist will be on call and available to answer questions from contractors.

Toolbox talk

Prior to commencement of construction on site, a toolbox talk will be provided to the site team by a Suitably Qualified Ecologist. The toolbox talk will cover:

- A summary of survey findings and overview of the ecological receptors, their ecology, habitat requirements and conservation status;
- Maps of the sensitive areas and ecological receptor's locations and buffer zones that will be kept throughout the construction. Contractors will be informed that no equipment will be stored and no activities are to be undertaken within the buffer zones and habitats;
- The legal protection afforded to the ecological receptors;
- The role of the Ecological Clerk of Works (ECoW) and the contractors responsibilities;
- A description of the mitigation measures that need to be implemented and followed at all times; and
- Species to look out for during construction and what to do in the event that an ecological receptor is found.

A record of this talk will be kept and all attendees will be asked to sign that they have understood the measures discussed. A subsequent toolbox talk will be provided to any new site members and/or at the start of a new work phase/stage.

CEMP

To ensure best practice is implemented during the construction phase and existing retained habitats on site and ecological receptors are protected, a CEMP has been compiled⁵. This is an live document that will be updated as and when required and should include but may not be limited to the following control measures:

Noise and Vibration

Table 8.1 outlines noise and vibration issues requiring attention and identifies the control measures to be implemented.

Table 8.1 Noise and vibration management

Noise and Vibration	Control Measure
Site set-up and operating hours	Normal working hours will be 8.00am -6.00pm Monday to Friday, and 9.00am -1.00pm Saturday.
Construction traffic (delivery vehicles, site personnel etc.)	All goods, equipment, plant and materials will be transported by existing roads. Deliveries times will be planned to minimise potential disturbance to birds using the lagoon, the delivery location will be out of view of the lagoon.
Construction plant and equipment	Site compounds to be sited on existing areas of hardstanding and at least 30m away from sensitive areas, with fencing / barriers to prevent encroachment on the 30m buffer. Any static plant to be sited within the fenced off compound. Site compounds will be chosen to be as far from the lagoon as reasonably possible. Plant and equipment to be switched off when not in use. Plant and equipment to be maintained and operated in accordance with operators instruction and to ensure that excessive noise levels are not generated Regular integrity checks of noise mitigation measures fitted to items of plant Acoustics screens or enclosures for stationary or semi-stationary plant (e.g. generators) will be considered; Best practicable means will be included to control construction noise in the form of low noise emission plant, as specified in BS5228-1. Timing of works to avoid sensitive periods in order to reduce impacts on wildlife.

Materials and Waste

Table 8.2 outlines the materials and waste issues requiring attention and identifies the control measures to be implemented.

Table 8.2 Materials and waste management

Materials and waste issue	Control measure
Storage, handling and management of materials and waste	Materials and waste to be stored in a commercial skip sited within the works compound before removal from site. Waste containers to be securely covered to ensure wastes cannot be blown or washed away. Any oils, fuels and liquids used will be appropriately labelled and will be securely stored within the site compound (storage to include bunding and tamper proof and lockable valves, as appropriate). Spill kits to be located near to the works areas and within storage compounds, with personnel being trained in their use. Daily walkover will be undertaken to collect other material.
Waste disposal strategy	Domestic waste shall be taken off-site and disposed of daily. Recyclable waste shall be taken for disposal at the available recycling facilities; any metalwork for example will seek to be recycled through the local scrapyard or reused.

Air quality and dust emissions

Table 8.3 Air Quality, Dust and Emissions management

Air Quality, Dust and Emissions issue	Control measure
Site set-up and operation	Use of debris shields / mesh around all sides of the construction zone.
Air quality and emissions	Vehicles, plant and equipment on site to be well maintained and regularly serviced. Vehicles, plant and equipment to be switched off when not in use. Where reasonably practicable, fixed items of construction plant will be electrically powered in preference to diesel or petrol driven
Dust/debris	Manual road / path sweeping to be employed to remove excess build-up of material, as appropriate. Any dust generating materials transported to and from site to be securely covered. Any dust generating materials stored on site to be located out of the wind, screened or covered.
Monitoring	Regular visual checks for dust, debris and emissions arising to be undertaken across the site and log of results maintained.

Site specific control measures

- Timed works along the lagoon to avoid the most sensitive period for breeding birds (March to August)
- Timed removal of scrub habitat to avoid the breeding bird season (March to August) on nature reserve;
- Timed removal of scrub habitat to avoid the breeding bird season (March to August) unless confirmed likely absent by a Suitably Qualified Ecologist on the proposed Visitor Centre and car park site;
- Timed works along the lagoon to avoid the most sensitive period for overwintering periods (October to March) unless measures to mitigate/reduce impact are in place;
- Provision of a wildlife sensitive lighting scheme during construction that follows guidance from the BCT and ILP³³; and
- Biosecurity protocols such as thorough wheel washes and invasive species works exclusion zones enforced by fencing and signage (3m zones for all invasive species present on site except for Japanese Knotweed, which is 10m WEZ) to be followed to prevent non native/invasive species from spreading.

LEMP

The LEMP which is proposed to be secured by planning condition. This will include monitoring measures to ensure that habitat enhancement works are successfully delivered and managed accordingly in the medium to long term. Given the unique approach to the mitigation proposed it is anticipated that this monitoring programme will provide and invaluable learning opportunity for future creation and management priority grasslands.

It is recommended that habitat and species-specific mitigation measures are incorporated into a LEMP and CEMP as appropriate.

Trenching

During the proposed works any deep trenches and holes will be covered at the end of each working day, or include a ramp as a means of escape for any animals falling in.

Removal of Invasive Species

Within the development footprint, any invasive species will be removed by specialist contractors and disposed of following best practice guidance³⁴. Bio-security principals inclusive of works exclusion zones will be followed throughout the construction to prevent the spread of invasive species.

8.2 DESIGNATED SITES

Receptors of greatest note described in the citation text and relevant to this site include:

- General wildfowl, seabird and wader assemblages (breeding and overwintering);
- 'Fixed coastal dunes with herbaceous vegetation (grey dunes)';
- Notable plants;
- Natterjack toad populations;
- Invertebrate populations;

These receptors considered in depth under the relevant headings below.

The proposed Visitor Centre area lies immediately outside the statutory site and the RPSB site falls entirely within the designation boundary. Natural England have been consulted throughout the design stage process and works taking place with the designation boundary will require their consent.

To ensure habitats on site are protected, the CEMP⁵ will be followed throughout the duration of the works. This document incorporates the following measures:

- All personnel involved in the construction works will be briefed on ecological mitigation and relevant wildlife legislation.
- Prior to works commencing (inclusive of site clearance or devegetation works), temporary fencing will be erected around all new and retained features, including waterbodies, dune habitats and grasslands, to delineate no go areas for workers and machinery. Temporary fencing will also be erected around stands of invasive species at this stage to ensure works do not inadvertently advance the spread of invasive species within the site.
- Zones for the piling of soil or storage of materials associated with the development will be clearly defined and on existing areas of hardstanding. Fuel, oil and other chemicals will be stored in appropriate containers that are impervious to the material being stored also stored on areas of existing hardstanding with bunding. Leaking and empty containers will be removed from the site immediately.

Good practice noise and vibration mitigation measures in line with Best Practicable Means (as set out in BS 5228:2009) will be followed throughout the construction phase. Examples are provided below:

- Good maintenance of plant to ensure that excessive noise levels are not generated;
- Regular integrity checks of noise mitigation measures fitted to items of plant;
- Acoustics screens or enclosures for stationary or semi-stationary plant (e.g. welding sets, generators) will be considered;
- Equipment will be switched off when not in use; and
- Where reasonably practicable, fixed items of construction plant will be electrically powered in preference to diesel or petrol driven.

Further habitat-specific and species-specific protection measures are discussed in the following sections and will be incorporated into the CEMP.

8.3 HABITATS

Proposed Visitor Centre

The loss of 21m² of Priority Lowland Meadow habitat requires bespoke mitigation and compensation.

The breaking up 338m² of existing hardstanding to give back natural habitat, can be used to compensate for the loss of the lowland meadow. Given the close proximity of the retained lowland meadow and calcareous grassland it is realistically achievable as the soils are suitable for meadow creation. It is likely that overtime these habitats will expand onto these new areas. However the creation success can be sped up and managed to targeted condition through the following steps³⁵:

- Creation of firm seed beds free from perennial weeds;
- Seeds from the neighbouring habitats will be harvested after flowering;
- Seeds will be sown in early Autumn;
- Management of newly sown grassland through cutting and removal of vegetation.

A Biodiversity Net Gain Assessment (BNGA) has been undertaken using the Statutory Biodiversity Metric (SBM) to demonstrate the gains and losses across the site. The development proposals will deliver a gain of 20.37% in biodiversity units (ref: 553023lt09Apr25FV01_BNGA.). The Environment Act secures habitat management for a minimum of 30 years and therefore this development will ensure the long-term conservation and enhancement of the habitats and species at site through a sustained commitment to management; the absence of which could risk some of the sensitive habitats due to successional habitat change.

In addition to loss, construction impacts of the development include pollution events, trampling from footfall and machinery and spreading of invasive species. However, following the adoption of industry best practice such as the measures provided above, which are set out within the CEMP⁵, dust deposition during the construction will be controlled to a level that would not result in a significant effect on adjacent habitats.

Nature reserve

Minimal habitat loss is expected as 573,600m² of habitat will be retained of which 42,400m² of habitat will be enhanced. And habitat loss will be restricted to habitats that are previously used as desire lines and already subject to high levels of trampling and small pockets of dense scrub. However proposals will narrow and formalise the existing footpath, restrict access to vehicles allowing habitats under existing unofficial car parks to recover and habitats to expand.

Sensitive areas such as the Annex I 'Fixed coastal dunes with herbaceous vegetation (grey dunes) habitat' is currently subject to heavily trampling (see Figure 8.1). It is recommended as part of proposals that sensitive habitats will be fenced off and the picnic bench within this area will be moved to allow the habitats to recover. Signage will inform site visitors during the removal of desire lines to explain the reasons behind the decisions and highlights alternative routes.

Figure 8.1 'Fixed coastal dunes with herbaceous vegetation (grey dunes) habitat' subject to existing trampling (Photo taken in February 2023)



The paths will be formalised through use of natural and permeable materials on existing paths/desire lines to ensure the site is accessible to all and encourage site visitors to stick to official paths.

Figure 8.2 Examples of pathway formalisation



The restrict vehicular access along the BOAT to emergency and maintenance vehicles only and therefore the habitats underneath existing unofficial car parks can recover. Natural space can expand and provide opportunities for encroachment of nearby habitats such as the adjacent unimproved calcareous grassland which is known to support waxcap communities and can evidently survive the exposed conditions along the seawall. The structural diversity will create microclimates that will support invertebrates.

Figure 8.3 The excessively wide road along the sea wall (Photo taken in February 2023 looking south east)



8.4 NOTABLE PLANTS

Proposed Visitor Centre

Where significant stands of notable plants are located within the area of Lowland Meadow proposed for clearance, a translocation exercise is recommended to relocate the plants into areas of retained lowland meadow or areas of former hardstanding given back to nature. This will likely comprise the removal of the existing turf and soil to a depth of approximately 40 cm using a turf stripper. The specific methodology will be incorporated into a Notable Plants Mitigation Plan which could be incorporated into the CEMP and LEMP as appropriate.

Nature reserve

There is no habitat loss and consequently no notable species loss is expected as a result of the formalising of the paths. The proposal will narrow and formalise the existing footpath, restrict access to vehicles allowing habitats under existing unofficial car parks to recover and habitats to expand and provide opportunities for notable species to flourish.

The Irish dandelion specimen was located alongside the existing access road for the Household Waste Recycling Centre. It is understood that this will be removed to develop the surface water access drain.

The updated NVC shall confirm whether this species is still present and The specific methodology will be incorporated into a Notable Plants Mitigation Plan which could be incorporated into the CEMP and LEMP as appropriate.

8.5 BREEDING BIRDS

Proposed Visitor Centre

No qualifying species are likely to be impacted during the construction phase of this development.

Small passerine species are likely to nest within the scrub which is proposed for clearance. Habitat removal will take place outside of the nesting bird season, taken to run from March to August inclusive, or after an SQE has confirmed the absence of nesting.

Nature reserve

Passerine species are likely to nest within the scrub in the northern part of the reserve, which is proposed for clearance. Habitat removal will take place outside of the nesting bird season, taken to run from March to August inclusive.

Works along the sea wall BOAT have potential to disturb the qualifying breeding tern and gull populations. The exact machinery for the works is yet to be determined however typical construction plant and noise levels for road creation are likely to range between 109.4dBA- 111.5dBA³⁶ at source. The closest point of the tern island and the BOAT is approximately 80m which is under the recommended buffer zone of 100m for motorboats³⁷ which produce levels of up to 85 dBA). It is likely the plant requirements and associated noise levels are likely to be smaller and lighter than those required for larger scale road projects. Acoustics screens or enclosures for stationary or semi-stationary plant (e.g. generators) can reduce noise levels by up to 30dBA and activities that cause sudden loud noises (above 50dBA) are to be avoided as much as is feasible.

Best practicable means will be included to control construction noise in the form of low noise emission plant, as specified in BS5228-1. Best practicable means includes control at source, such as the selection of quiet and low vibration equipment, a review of the construction programme and methodology to consider quieter methods, and the use of less intrusive alarms such as reversing warnings.

Therefore it is recommended that works in this highly sensitive ecological area (along the sea wall) during the breeding bird season (March to August, inclusive) are avoided entirely.

Ahead of works starting in September, a SQE will check that terns are no longer nesting, and use of acoustics screens should be used if not.

Whilst these mitigation actions focus on the qualifying species, it will avoid/mitigate impacts on all bird species breeding on the lagoon.

8.6 OVERWINTERING BIRDS

Proposed Visitor Centre

As there are no construction impacts upon overwintering birds predicted, there are no required mitigation actions.

Nature reserve

At its closest point, the Iron line path lies within 15m from the lagoon edge with varying buffer vegetation in the form of scrub and trees between. The construction works that will likely have the highest impact on overwintering species is considered to be the formalisation of the path and BOAT along the sea wall. Given the number of different species at Hodbarrow Lagoon, there will be a variance in tolerance to disturbance. To minimise impacts on overwintering birds, it is recommended that a higher effort of works takes place along the old sea wall avoiding the sensitive period for overwintering periods 31st October – 31st March as much as possible. Considering the nesting bird season constraints in the section above, this allows for works along the sea wall should take place between September and October.

Should the work along the sea wall be delayed or anticipated to take longer then it is recommended that acoustic screens are installed to minimise disturbance onto the lagoon which can minimise noise disturbance by up to 30 decibels (dBA) as well as screen movement of vehicles and workers from the birds.

The highest buffer zone for overwintering bird species was the local BAP species Black-throated Diver the recommended buffer zone for which is <1000m. This species has had a peak count of 1 individual over the past 10 years. The next highest buffer zone was Goldeneye which is a qualifying species and the recommended buffer zone ranges from 150-800m. Given the wider area of lagoon available it is likely that any works that are required outside of the September-October window will not cause a significant impact to the overwintering birds. However, it is recommended that an ECoW is present during the works along the iron wall who identify the species using the lagoon and can make an assessment on the distance/sensitivity and advise each day on whether works can continue or should wait until the following window.

Whilst these mitigation actions focus on the qualifying species, it will avoid/mitigate impacts on all bird species overwintering on the lagoon.

8.7 NATTERJACK TOADS

Proposed Visitor Centre

The boundary proposed is broadly unsuitable as natterjack toad habitat and the proposals are unlikely to result in any terrestrial habitat loss for natterjack toad. Notwithstanding, depending on the timing of works, reasonable precautions would likely be necessary to ensure no European species or other priority

species, are present. A specific Amphibian Mitigation Plan will be produced which could be incorporated into the CEMP and LEMP as appropriate and would include the following:

- Protect retained amphibian habitat with fencing;
- Siting any piles of aggregate material away from areas of suitable amphibian habitat;
- Construction works should check under wheels of machinery/vehicles each morning for any animals before starting;
- Any scrub vegetation will be cleared in a phased manner; and
- An ECoW will be present to oversee works throughout key phases including precautionary site presences for any works associated with the ditch on site.
- Amphibian gully pot ladders are recommended if any street drains will be installed.

Nature reserve

Natterjacks may use potholes within the BOAT opportunistically. Therefore, depending on the timing of works, reasonable precautions are recommended which could be detailed within a specific Amphibian Mitigation Plan will be produced which could be incorporated into the CEMP and LEMP.

8.8 REPTILES

Proposed Visitor Centre

No isolated habitat loss is proposed and therefore, a translocation exercise is not necessary implemented. However, to ensure the protection of reptiles throughout the construction of the development the following species-specific measures will be adopted:

- Enhance areas proposed for retention with log piles and hibernacula to increase carrying capacity;
- Protect retained reptile habitat with fencing;
- Siting any piles of aggregate material away from areas of suitable reptile habitat;
- Where reptile habitat is to be lost, habitat manipulation will be implemented to move reptiles into adjacent areas of enhanced habitat;
- Any scrub vegetation will be cleared in a phased manner; and
- An ECoW will be present to oversee works throughout key phases including precautionary site presences for any works associated reptile habitat.

A specific Reptile Mitigation Plan will be produced which could be incorporated into the CEMP and LEMP as appropriate.

Nature reserve

As there are no construction impacts upon reptiles are predicted, there are no required mitigation actions. As a precaution the recommendations included within the specific Reptile Mitigation Plan will be adhered to at a site wide level.

8.9 INVERTEBRATES

Proposed Visitor Centre

The loss of scrub and grassland habitat will likely have a temporary negative effect on invertebrates however proposals seek to create and enhance existing habitats and compensate for the temporary loss. Proposals will incorporate invertebrate features across the site.

Nature reserve

As there are no construction impacts upon invertebrates predicted, there are no required mitigation actions.

8.10 AMPHIBIANS

Proposed Visitor Centre

To prevent the accidental killing or injury of amphibians on site the measures covered in the precautionary method of works described above for reptiles will also protect amphibians. This includes:

- Phased clearance of suitable terrestrial habitat;
- Protect retained suitable habitat;
- Siting any piles of aggregate material away from areas of suitable amphibian habitat;
- Any suitable terrestrial vegetation will be cleared in a phased manner; and
- An ECoW will be present to oversee works throughout key phases including precautionary site presences for any works associated with the ditches on site.

Nature reserve

To prevent the accidental killing or injury of amphibians on site the measures covered in the precautionary method of works described above for reptiles will also protect amphibians.

8.11 BATS

Proposed Visitor Centre

Scrub clearance will be done under presence of a licenced Suitably Qualified Ecologist. Should any potential bat roost features be identified then works will cease and the SQE will carry out a bat

endoscopic survey to assess the potential for/presence of roosting bats. As there are no construction impacts upon bats predicted, there are no required mitigation actions.

Construction will take place during daylight hours however the CEMP will include measures that will avoid light spill during construction onto the retained natural habitats such as the grassland and surrounding scrub.

Nature reserve

Scrub clearance should be done under presence of a licenced Suitably Qualified Ecologist. If any features are encountered where it is suspected that bats might be present, then works will cease and the SQE will carry out a bat endoscopic survey to assess the potential feature for presence of roosting bats. If roosting or evidence of roosting is observed a licence will be sought to legally carry out the works.

Construction will take place during daylight hours however the CEMP will include measures that will avoid light spill during construction onto the retained natural habitats such as the grassland and surrounding scrub.

8.12 BADGER

Proposed Visitor Centre

Given the limited evidence of badgers using the site, it is unlikely that the removal of dense scrub would reveal presence of an active badger sett. Nonetheless, vegetation clearance works will be done under presence of a licenced ECoW. In the unlikely event a badger sett is located then works will cease and a monitoring survey will take place to determine appropriate mitigation.

Nature reserve

No excavation is taking place during the formalisation of the footpaths. The potential badger hole identified is over 30m from any proposed works therefore no mitigation is required. Any clearance of dense scrub will be undertaken under the supervision of a ECoW. If any holes are identified, the works will cease and a monitoring survey will take place to determine appropriate mitigation.

8.13 OTTER

Proposed Visitor Centre

Any scrub vegetation will be cleared in a phased manner under the supervision of an ECoW. Further to this, any trenches/pits created during the construction process will either be covered over at night or will include a means of escape (scaffold board or similar) to prevent animals becoming trapped in them.

Should any evidence of otter holts be identified during scrub clearance, the works will cease in this area and a European Protected Species licence will be sought.

Nature reserve

Any scrub vegetation will be cleared in a phased manner under the supervision of an ECoW. Further to this, any trenches/pits created during the construction process will either be covered over at night or will include a means of escape (scaffold board or similar) to prevent animals becoming trapped in them.

Should any evidence of otter holts be identified during scrub clearance, the works will cease in this area and a European Protected Species licence will be sought.

8.14 HEDGHOG

Proposed Visitor Centre

Any scrub vegetation will be cleared in a phased manner under the supervision of an ECoW. Once cleared to a lower level the scrub and any leaf litter will be preceded by a hand search.

Further to this, any trenches/pits created during the construction process will either be covered over at night or will include a means of escape to prevent animals becoming trapped in them.

In the event that hedgehogs are found, the ECoW will remove them and place them in suitable habitat that is earmarked for retention.

Nature reserve

No suitable hedgehog habitat is proposed for clearance and therefore no mitigation is required.

9.0 OPERATIONAL MITIGATION AND COMPENSATION MEASURES

This section describes the mitigation and compensation measures recommended for operational phase of the development. Ecological receptors where 'negligible' impact is predicted are not considered within this section.

9.1 GENERAL BEST PRACTICE

Species Specific Mitigation Plans

It is recommended that habitat and species-specific mitigation measures are incorporated into a LEMP which is proposed to be secured by planning condition. The long-term management of this site will ensure that targeted habitat conditions can be reached and maintained in perpetuity and monitoring will ensure that remedial actions can be taken should impacts threaten the ecological receptors.

Horticultural Best Practice

During the 30 year management of the site and beyond, horticultural best practice methods will be applied including:

- Biosecurity protocols will be followed;
- Locally sourced plants/mulch and peat-free compost;
- Pesticides and herbicides not used (only used for removal of invasive species);
- Litter removal; and
- Products should avoid the use of plastics which may degrade and form microplastics.

9.2 DESIGNATED SITES

Proposed Visitor Centre

The drainage strategy has been designed to ensure no surface water runoff or foul water discharge into the lagoon. As such there will be **Negligible effects** on the lagoon. The operational impact associated with the increase in visitors on the designated site is provided in detail below.

Nature reserve

The increase in visitors may result in an increase in disturbance to the qualifying breeding and wintering bird assemblages. Operational impacts on breeding and over-wintering bird populations are addressed in more detail in their respective chapters below.

The aspirations of the scheme will be that there will be a reduction of cars using the BOAT and parking in the unofficial parking spot immediately adjacent to the cited Annex I H2130 Fixed coastal dunes with

herbaceous vegetation (grey dunes) habitat. As such this should reduce antisocial activity associated with off-road driving across grassland and dune habitats on the site, reduced fly tipping as well as reduced airborne NO_x levels associated with cars.

The increase in visitors may result in degradation to qualifying habitats through activities such as additional footfall, littering, greater presence of dogs and resultant dog faeces as well as spreading of invasive species.

The Annex I habitat Fixed coastal dunes with herbaceous vegetation (grey dunes) is already subject to high levels of trampling from footfall (see Figure 8.1). It is likely that the removal of the picnic bench will reduce the trampling in this area and it is recommended that this is cordoned off and signage is provided to explain the importance of this habitat and allow it to recover. To address the increase in littering and dog waste there will be a provision of litter and dog waste bins across the site which will be provided.

Whilst invasive species will be removed from site as part of the proposals opportunities for spreading of invasive plants may still arise from the footfall of visitors. As part of on-going management actions of the site will include monitoring for the spreading of invasives. Remedial actions will involve the removal of any invasives noted during the monitoring.

9.3 HABITATS

Proposed Visitor Centre

The increase in visitors brings potential for indirect impacts in the form of habitat degradation from increase in footfall, littering and nitrogen increase of cars and from additional dog faeces.

Proposals seek to formalise paths to direct pedestrians away from sensitive habitats. There is a large expanse of Annex I grassland adjacent to the proposed for the proposed Visitor Centre and car park site. The Iron Line Visitor and Access Management Plan produced by Appletons details the short- and medium-term actions increase the capacity of the site for visitors whilst maintaining the sensitive habitats present within the reserve.

The aspirations of the scheme will be that there will be a reduction of cars using the BOAT and parking in the unofficial parking spot immediately adjacent to the cited Annex I H2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) habitat. As such this should reduce antisocial activity associated with off-road driving across grassland and dune habitats on the site, reduced fly tipping as well as reduced airborne NO_x levels associated with cars.

Research suggest that signage is an effective way of reducing disturbance caused by visitors at unmanaged wildlife sites³⁸ and can be used to raise awareness of the importance of the site and what species they may see. The sensitive habitats within this area are behind the Visitor Centre and the path to the nature reserve directs people away from this area. However in addition, the grassland can be cordoned off, such as with roped, to deter people from walking across the open grassland. Sufficient provision of dog bins and litter bins around the car park and Visitor Centre should encourage site visitors

to use these and reduce opportunities for littering. The proposed Visitor Centre café should aim to limit the selling of plastic and take-away options to decrease the likelihood of littering as a result of the café.

Habitat degradation of important habitats is also possible via reactive nitrogen deposition from cars using the car parks and on newly constructed roads and an increase dog faeces for example. The Visitor Centre and existing scrub habitat will be retained to provide a physical barrier and filter some of the pollutants from the car park³⁹. Signs will be installed around the car park to inform visitors the car parks are an engine idle free zone. It is recommended that monitoring will take place to identify any changes in forbs and to identify any remedial actions required.

Overall, the development secures the habitat management for the next 30 years and as a result, the long-term conservation and enhancement of the habitats and species at site through a sustained commitment to management; the absence of which could risk some of the sensitive habitats due to successional habitat change.

Nature reserve

There is no predicted increase in cars using the site therefore this has not been considered further.

Proposals seek to narrow existing paths and also close off some desire lines that currently run across sensitive habitats, providing an overall increase in area available for sensitive habitats and allowing habitat recovery.

Operational impacts would be in the form of habitat degradation from additional footfall, littering, dog waste. The measures detailed in the proposed Visitor Centre section above such as cordoning off sensitive habitats, provision of litter and dog waste bins and signage will mitigate impacts onto sensitive habitats. The increased presence of people on site and the creation of the proposed Visitor Centre may also reduce antisocial use of the site, such as fly-tipping, camping and people setting campfires/barbeques.

As discussed, the development secures the habitat management for at least the next 30 years to ensure habitats remain in good condition. Habitats are currently unmanaged or infrequently managed due to lack of resources and the absence of management risks sensitive habitats due to successional habitat change.

9.4 NOTABLE PLANTS

Proposed Visitor Centre

Mitigation measures to address impacts to notable plants are provided in the habitats section above.

Overall, the development secures the habitat management for the next 30 years which will ensure the long-term conservation of notable species.

Nature reserve

Mitigation measures to address impacts to notable plants are provided in the habitats section above.

9.5 BREEDING BIRDS

Proposed Visitor Centre

The presence of a Visitor Centre and car park is predicted to increase the numbers of visitors to the nature reserve. The mitigation measures for this are described in the nature reserve section below.

Nature reserve

The proposals seek to fortify and extend the existing bund along the sea wall BOAT as well as restrict vehicular access along the BOAT to emergency and maintenance vehicles only and therefore the unofficial car parks can recover, natural space can expand and provide opportunities for these plants to grow. Despite an increase in visitors the bund will ensure that this increase will be visibly unnoticeable to the terns. Furthermore, the proposals are likely to reduce the occurrences of behaviour likely to disturb the terns such as antisocial driving cars/mopeds/motorbikes along the BOAT and reduce access points to allow for kayakers and paddleboarders to enter the water from the RSBP reserve side.

In addition, proposals seek to include signage and education boards to raise awareness of the international importance of the tern and gull colonies on site. This will increase the level of respect and understanding of site visitors and is an effective way of reducing disturbance caused by visitors at unmanaged wildlife sites⁴⁰.

The tern and gull nest on islands which are surrounded by anti-predation fencing which gives them an additional level of protection against dog predation. The site is an RSPB reserve and there will be an existing level of understanding about the sites importance for birds and signage will be surrounding the site to remind visitors to keep dogs on leads. The continued presence of a tern warden during the breeding season will help prevent disturbance to the terns. Visitor numbers and any impacts on terns will be closely monitored by the warden and remedial actions will be undertaken if necessary, such as controlling visitor numbers to the most sensitive areas during the busiest times.

Whilst these mitigation actions focus on the qualifying species, it will avoid/mitigate impacts on all bird species breeding on the lagoon.

9.6 OVERWINTERING BIRDS

Proposed Visitor Centre

As there are no operational impacts upon overwintering birds predicted, there are no required mitigation actions.

Nature reserve

Many of the mitigation actions for operational impacts provided in the breeding bird section above apply to the overwintering birds too. The fortification and extension of the bund will protect the birds from visual disturbance by shielding site visitors. The restriction of vehicular access along the BOAT to

emergency and maintenance vehicles only and the reduction in lagoon access points will reduce the behaviours such as anti-social driving of cars/mopeds/motorbikes and kayaking that have high disturbance potential.

Notably, proposals also seek to include interpretation and education boards to raise awareness of the international importance of the overwintering bird assemblages and increase the respect and understanding of the "rules" on site.

9.7 NATTERJACK TOADS

Proposed Visitor Centre

As there are no operational impacts upon natterjack toads, there are no required mitigation actions.

Nature reserve

The natterjacks were confirmed not present within the ponds on site, however nearby populations exist and suitable habitat exists on site. Signage will be used to provide information about their ecology, identification tips and give a deeper understanding of natterjacks. In addition, more refugia will be created across the site allowing natterjacks to shelter and seek refuge.

Proposals seek to maintain the available breeding habitat for natterjack toads through scrub management and ponds will be fenced off to prevent disturbance from dogs and the leaching of flea treatments. Overall, the proposals will maintain the sites suitability for natterjacks.

9.8 REPTILES

Proposed Visitor Centre

The potential for increased disturbance and harm from people and dogs will be mitigated through the formalisation of paths which will limit the opportunities for disturbance. Signage will be also used to provide information about their ecology, identification tips and give a deeper understanding of the reptiles present. In addition, more refugia will be created across the site allowing reptiles to shelter and seek refuge.

Nature reserve

The potential for increased disturbance and harm from people and dogs will be mitigated by signage about reptiles and the formalisation of the paths. More refugia will be created across the site allowing reptiles to shelter and seek refuge.

9.9 INVERTEBRATES

Proposed Visitor Centre

Proposals will increase the amount of habitat of value for invertebrates and the structural diversity for invertebrates. As such, no mitigation or compensation is required.

Nature reserve

Proposals will increase the amount of habitat of value for invertebrates and the structural diversity for invertebrates. As such, no mitigation or compensation is required.

9.10 AMPHIBIANS

Proposed Visitor Centre

As there are no operational impacts upon amphibians are predicted, there are no required mitigation actions.

Nature reserve

As there are no operational impacts upon amphibians are predicted, there are no required mitigation actions.

9.11 BATS

Proposed Visitor Centre

Proposals will increase the amount of habitat of value for foraging bats. Indirect impacts would be in the form of additional artificial lighting associated with the proposed Visitor Centre. The proposed Visitor Centre operating hours will close before sunset during the active bat season however it may in some cases be hired out for private functions. Therefore lighting will be designed to avoid light pollution where appropriate, as detailed within Guidance from BCT and Institute of ILP⁴¹:

Measures at both the construction and operational phase of the development will include:

- Low-UV warm-white LED Bulbs (<2800k);
- Directional, downward facing and shielded lights;
- Lighting which points away from green features such as the grassland and surrounding scrub; and
- Lighting subject to curfew controls and movement sensors where possible.

Nature reserve

Proposals will increase the amount of habitat of value for bats and no additional lighting is proposed around the reserve. As such, no mitigation or compensation is required.

9.12 BADGER

Proposed Visitor Centre

As there are no operational impacts upon badgers predicted, there are no required mitigation actions.

Nature reserve

As there are no operational impacts upon badgers predicted, there are no required mitigation actions.

9.13 OTTER

Proposed Visitor Centre

As there are no operational impacts upon otters predicted, there are no required mitigation actions.

Nature reserve

As there are no operational impacts upon otters predicted, there are no required mitigation actions.

9.14 HEDGHOG

Proposed Visitor Centre

As there are no operational impacts upon hedgehogs predicted, there are no required mitigation actions.

Nature reserve

As there are no operational impacts upon hedgehogs predicted, there are no required mitigation actions.

10.0 ENHANCEMENT MEASURES

To enable proposals to deliver the desired net gains, the following measures will be considered for incorporation into the landscaping plans.

10.1 BIODIVERSITY NET GAIN ASSESSMENT

In accordance with the Environment Act and National Planning Policy Framework (Appendix B), proposals should deliver a minimum of 10% net gain in biodiversity, which should be evidenced through a Biodiversity Net Gain Assessment (BNGA) using the Statutory Biodiversity Metric (SBM)⁴². The BNGA report (ref: 553023lt09Apr25FV01_BNGA) demonstrates that development proposals will exceed local and national targets with a 20.37% net gain in biodiversity units.

The following landscaping features will contribute to this net gain:

- Formalising existing paths/desire lines to discourage site users from wandering onto sensitive habitats;
- Restricting use of existing roads, narrowing of paths and closing desire lines;
- Enhancing the 'Lowland calcareous grassland' (Annex I Semi-natural dry grasslands and scrubland facies on calcareous substrates) from Moderate condition to Good;
- Enhancing 'Mixed scrub' from Moderate condition to Good and enhancing 'Bramble scrub' to Good condition 'Mixed scrub' and
- Removal of invasive species within the development footprint and areas proposed for enhancements.

10.2 NATTERJACK TOADS

Natterjack population size is usually limited by the number of suitable breeding ponds available rather than by the extent of terrestrial habitat and a sound management strategy is to maximise the numbers of breeding sites as the first priority in most situations⁴³. The habitat preferences of natterjack toads include:

- Open, unshaded terrestrial habitat with extensive areas of unvegetated or minimally vegetated ground (i.e. with vertical plant growth of no more than 1 cm or so)
- Unshaded, ephemeral ponds with shallow, gradually shelving margins and few predators or competitors, for reproduction.

Once the dense scrub has been cleared, proposals seek to create three additional ponds for natterjacks. Scrapes to be lined with concrete and backfilled with slag from the surrounding area. The ponds will have gently sloping sides to ensure safe passage out of the pools for toadlets and hold water down to a maximum water depth of 50 - 70cm that will dry out in late summer in an average year. The use simple pipe sluices could be installed so that the pools can be drained down in late summer.

A detailed Amphibian Management Plan will be incorporated into a LEMP. This Management Plan will also be iterative in the medium to long-term, adapting to changing site conditions and in response to the feedback from monitoring exercise. If required, these ponds could be used for a translocation of pillwort and natterjacks.

In addition to the pools nearby resting/hibernation habitat will be created through the provision of sandy banks, stone walls, piles of stones. These areas will be fenced off to members of the public and dogs.

Figure 10.1 Example of natterjack pond creation by Denbighshire Countryside Service



There were several mitigation ponds created in 2017 and 2023. It is understood that RSPB have fenced off these ponds in 2025 which will reduce disturbance from humans and dogs. The management actions from these proposals could include a visual check of fencing within a management plan and actioning remedial repairs as and when required.

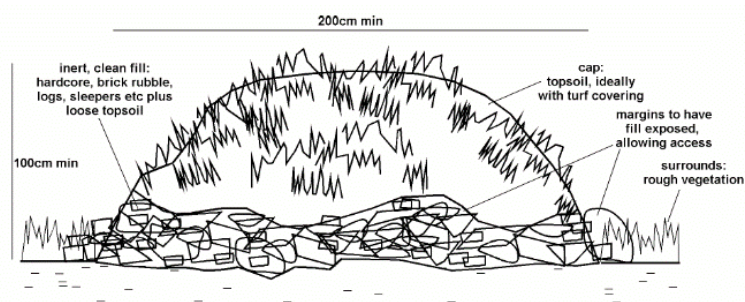
Should the recommended monitoring surveys identify that Natterjacks have not dispersed onto site then remedial actions will include either discussions with local landowners to create suitable connecting habitat from existing breeding areas or a translocation exercise will be explored.

10.3 REPTILES

Around the areas of grassland log/brush piles will be incorporated in suitable locations. Each log pile will be at least 1m x 1m, comprise a mixture of log sizes and shapes and be placed in a sunny location within

existing suitable habitat. Hibernacula will be created to provide overwintering hibernation habitat and will comprise a mixture of logs and inert hardcore (bricks, flint, rubble) topped with soil and turf covering.

Figure 10.2 Reptile enhancement features (piles of brash left, hibernacula right)⁴⁴



10.4 INVERTEBRATES

Locally sourced felled wood, including any wood collected during site clearance, will be used to create loggeries for saprophytic invertebrates within areas more shaded. Log sizes will range from ~10cm up to ~40cm diameter and approximately one third of the log will be buried.

Invertebrate habitat panels and solitary beehives will be included in sunny, south-facing areas within landscaped areas. Panels will use untreated wood products which provide a range of opportunities for sheltering and nesting solitary bees and other invertebrates.

RSPB have ongoing work with University of Cumbria to establish small blue habitat, possible reintroduction from Barrow dunes. Proposals will include the creation of bunds that will increase the habitat available for small blue butterfly.

Figure 10.3 Invertebrate features- Bug hotels (left, centre), Butterfly bunds (right)



10.5 BAT FEATURES

Most species of bats will use bat boxes at various times of year but in particular they are favoured by pipistrelles, Leisler's, noctules and *Myotis* species. Pipistrellus sp were identified within the local environmental records and are known to be in the wider area, therefore, bat boxes will be affixed to suitable existing or new structures around the site, or to free standing poles; the use of these bat boxes will increase roosting opportunities for bats in the area.

Figure 10.4 Summer roosting boxes (left) maternity roosting boxes (middle) and hibernation roosting boxes (right)



10.6 HEDGEHOG HOUSES

Hedgehog houses will be provided in areas of scrub across the site.

Figure 10.5 Example of hedgehog house



10.7 PUBLIC ENGAGEMENT

Interpretation boards

Detailed interpretation boards will be installed around the site. The Interpretation board will highlight the habitat features present across the site as well as species which they may benefit. This is in order to promote the conservation of priority species and habitats. Graphics will also play a key role in communicating facts and encouraging further interest. It is recommended that modern graphics are opted so to engage a wider audience. These boards will help to raise public awareness and improve the understanding and appreciation of the different species found at site.

Figure 10.6 Examples of interpretation boards



Sightings boards

To further encourage engagement and citizen science opportunities, sightings boards will be installed by the proposed Visitor Centre. This can be used by visitors and volunteers to record any notable/interesting wildlife sightings. This could prove to be a useful record and monitoring tool, helping to track changes in species records and abundance over time as this EMP is actioned.

For the easiest and most practical application of sighting boards it is recommended that chalk boards are used, with the focus of monitoring around invertebrates and birds.

Figure 10.7 Example sightings board



Sense of community ownership

There are a number of volunteering opportunities throughout the enhancement of the site that would increase a sense of community ownership and pride. By engaging in a sensory activity which seeks to bring people together and to connect through nature the activity will be beneficial for human wellbeing and encourage respect for the site. Examples of volunteer activities for local schools/community:

- Creation of reedbeds;
- Creation of decoy terns;
- Creation of invertebrate houses;
- Creation of bird/bat boxes;
- Creation of hedgehog houses; and
- Seeding grasslands and butterfly banks.

Figure 10.8 Thamesmead volunteer programme building floating reedbeds



11.0 RESIDUAL IMPACTS

In this section of the report, the residual impacts on each of the receptors will be discussed in light of the above discussed mitigation, compensation and enhancement measures, with the general aim being to establish negligible overall impacts or, if possible, positive impacts for each species.

11.1 STATUTORY SITES

Proposed Visitor Centre

Construction

No direct construction impacts of the proposed Visitor Centre and car park on the qualifying features are predicted therefore, a **Neutral Residual Effect** is predicted.

Operation

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on the adjacent designated site during the operational phase.

Nature reserve

Construction

Through avoidance and mitigation measures, the development will have a **Neutral Residual Effect** on the designated site during the construction phase.

Operation

Upon successful implementation of the mitigation measures, the increase in visitors as a result of the development will have a **Neutral Residual Effect** on the qualifying features for designation.

The development secures the habitat management for the next 30 years and as a result, the long-term conservation and enhancement of the habitats and species at site through a sustained commitment to management. This will ensure that habitats are restored for natterjack populations to return and the absence of management could risk the deterioration of Annex I 'Fixed coastal dunes with herbaceous vegetation (grey dunes)', succession of habitat to reduce structural diversity for invertebrates. Overall, this could lead to a **Permanent, Positive Residual Effect at a National and International scale (Significant)**.

11.2 HABITATS

Proposed Visitor Centre

Construction

Assuming the mitigation measures are implemented, the proposals will adequately compensate for the loss of Lowland meadow habitat through the gains of 338m² from hardstanding back to natural habitat. This will have a **Permanent, Positive Residual Effect** at a **National scale**.

Operation

Through following the mitigation measures, the development will have a **Neutral Residual Effect** on the notable habitats during the operational phase.

Nature reserve

Construction

Through following the mitigation measures, the development will have a **Neutral Residual Effect** on the notable habitats during the construction phase.

The proposals will narrow and formalise the existing footpath, restrict access to vehicles allowing habitats under existing unofficial car parks to recover and habitats to expand and provide opportunities for habitats to flourish. The creation and restoration of these habitats will result in a **Permanent, Positive Residual Effect** ranging from between **Local and International scale (Significant)**.

Operation

The development secures the habitat management for the next 30 years and as a result, which contributes to a **Permanent, Positive Residual Effect** ranging from between **Local and International scale (Significant)**.

11.3 NOTABLE PLANTS

Proposed Visitor Centre

Construction

Assuming the mitigation measures are implemented, the proposals will adequately protect notable plant specimens and compensate for the loss of plants within the Lowland meadow habitat through the gains of 338m² from hardstanding back to natural habitat. This will have a **Permanent, Positive Residual Effect** at a **National scale (Significant)**.

Operation

Through following the mitigation measures, the development will have a **Neutral Residual Effect** on notable plant communities during the operational phase.

Nature reserve

Construction

Through following the mitigation measures, the development will have a **Neutral Residual Effect** on notable plant communities during the construction phase.

The proposal will narrow and formalise the existing footpath, restrict access to vehicles allowing habitats under existing unofficial car parks to recover and habitats to expand and provide opportunities for notable species to flourish. The creation and restoration of these habitats will result in a **Permanent, Positive Residual Effect (Significant)** on notable plant communities ranging from between Local and International scale.

Operation

The development secures the habitat management for the next 30 years and as a result, which contributes to a **Permanent, Positive Residual Effect (Significant)** on notable plant communities ranging from between Local and International scale.

11.4 BREEDING BIRDS

Proposed Visitor Centre

Construction

Assuming avoidance measures are followed, the development will have a **Neutral Residual Effect** on the breeding birds during the construction phase.

Operation

Assuming mitigation and enhancement measures are followed, the development will have a **Neutral Residual Effect** on the breeding birds during the operational phase.

Nature reserve

Construction

Assuming avoidance measures are followed, the development will have a **Neutral Residual Effect** on breeding birds during the construction phase.

Operation

Assuming mitigation and enhancement measures are followed, the development will have a **Neutral Residual Effect** on the breeding birds during the operational phase.

11.5 OVERWINTERING BIRDS

Proposed Visitor Centre

Construction

As there was no predicted impact upon the overwintering birds at the operational phase there is a **Neutral Residual Effect**.

Operation

As there was no predicted impact upon the overwintering birds at the operational phase there is a **Neutral Residual Effect**.

Nature reserve

Construction

Assuming avoidance and mitigation measures are followed, the development will have a **Neutral Residual Effect** on overwintering birds during the construction phase.

Operation

Assuming mitigation measures are followed, the development will have a **Neutral Residual Effect** on overwintering birds during the operational phase.

11.6 NATTERJACK TOADS

Proposed Visitor Centre

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on amphibians during the construction phase.

Operation

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on amphibians during the operational phase.

Nature reserve

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on amphibians during the construction phase.

Operation

Upon successful implementation of the enhancement measures to be delivered through the landscape design, the development will have a **Permanent Positive Residual Effect** on natterjack toad populations at a **National level (Significant)**.

11.7 REPTILES

Proposed Visitor Centre

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on reptiles during the construction phase.

Operation

Upon successful implementation of the mitigation measures, the operational phase will have a **Neutral Residual Effect** on reptile populations.

Nature reserve

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on reptiles during the construction phase.

Operation

Upon successful implementation of the mitigation measures, the operational phase will have a **Neutral Residual Effect** on reptile populations.

11.8 INVERTEBRATES

Proposed Visitor Centre

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on invertebrates during the construction phase.

Operation

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on invertebrates during the operational phase.

Nature reserve

Construction

The proposal will narrow and formalise the existing footpath, restrict access to vehicles allowing habitats under existing unofficial car parks to recover and habitats to expand providing more opportunities for invertebrates and therefore will have a **Permanent, Positive Residual Effect (Significant)** on invertebrates during the construction phase.

Operation

The development secures the habitat management for at least the next 30 years and as a result, which along with the invertebrate enhancements contributes to a **Permanent, Positive Residual Effect (Significant)** on notable invertebrate communities ranging from between Local and Regional scale.

11.9 AMPHIBIAN

Proposed Visitor Centre

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on amphibians during the construction phase.

Operation

As there was no predicted impact upon the amphibians at the operational phase there is a **Neutral Residual Effect**.

Nature reserve

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on amphibians during the construction phase.

Operation

As there was no predicted impact upon amphibians at the operational phase there is a **Neutral Residual Effect**.

11.10 BATS

Proposed Visitor Centre

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on bats during the construction phase.

Operational

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on bats during the operational phase.

Nature reserve

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on bats during the construction phase.

Operational

As there was no predicted impact upon bats at the operational phase there is a **Neutral Residual Effect**.

11.11 BADGER

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on badgers during the construction phase.

Operational

As there was no predicted impact upon badgers at the operational phase there is a **Neutral Residual Effect**.

Nature reserve

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on badgers during the construction phase.

Operational

As there was no predicted impact upon badgers at the operational phase there is a **Neutral Residual Effect**.

11.12 RIPARIAN MAMMALS

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on otters during the construction phase.

Operational

As there was no predicted impact upon otters at the operational phase there is a **Neutral Residual Effect**.

Nature reserve

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on otters during the construction phase.

Operational

As there was no predicted impact upon otters at the operational phase there is a **Neutral Residual Effect**.

11.13 HEDGEHOGS

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on hedgehogs during the construction phase.

Operational

As there was no predicted impact upon hedgehogs at the operational phase there is a **Neutral Residual Effect**.

Nature reserve

Construction

Upon successful implementation of the mitigation measures, the development will have a **Neutral Residual Effect** on hedgehogs during the construction phase.

Operational

As there was no predicted impact upon hedgehogs at the operational phase there is a **Neutral Residual Effect**.

12.0 EVALUATION AND DISCUSSION

The table below summarises potential ecological impacts upon key receptors in the absence of any mitigation or compensation, the mitigation and enhancement actions proposed as well as the residual effect in light of the mitigation and enhancement actions.

Table 12.1 Summary of residual effects

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Construction					
Designated Sites (SPA, SAC, Ramsar, SSSI)	Visitor Centre	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
	Nature reserve	Increased noise, visual activity and lighting disturbing the SPA and Ramsar qualifying breeding and overwintering birds .	Temporary to Permanent, Negative (Significant) Effect at an International Scale	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP⁵	Neutral Residual Effect
		Habitat degradation of SAC habitat Annex I H2130 Fixed coastal dunes with herbaceous vegetation (grey dunes) through pollution events and trampling and spreading of invasive species	Temporary to Permanent, Negative (Significant) Effect at an International Scale	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP⁵	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		by construction workers/machinery			
Annex I Habitats	Visitor Centre	Loss of 21m ² of regionally important Priority Lowland Meadow habitat	Permanent Negative (Significant) Effect at a Regional scale.	Compensatory lowland meadow planting through translocation and sowing seed mix	Permanent, Positive Residual Effect at a National scale (Significant)
		Pollution events, increased surface run-off, dust deposition, nitrogen deposition from machinery, trampling from construction workers resulting in degradation of habitat and spread of invasive species.	Temporary Negative (Significant) Effect at an International scale for Annex I habitats. Temporary Negative (Significant) Effect at a National scale for remaining priority habitats.	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP⁵	
		As a result of the proposals approximately 388m ² of hardstanding will be broken up and given back to nature which will increase the opportunity for sensitive habitats to expand.	Permanent, Positive (Significant) Effect at a Regional to National Scale.	n/a	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
	Wide Site	Pollution events, increased surface run-off, dust deposition, nitrogen deposition from machinery, trampling from construction workers resulting in degradation of habitat and spread of invasive species.	Temporary Negative (Significant) Effect at an International scale for Annex I habitats Temporary Negative (Significant) Effect at an International scale for all other habitats	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP⁵.	Permanent, Positive Residual Effect ranging from between Local and International scale (Significant)
		n/a	n/a	- Narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling - restrict access to vehicles allowing habitats under existing unofficial car parks to recover.	
	Visitor Centre	Loss of notable plant species during the removal of lowland meadow habitat	Loss of fern grass (<i>Catapodium rigidum</i>) will result in a Permanent,	Buffer zones around existing plants and retained areas	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Notable Plants			Negative (Not Significant) Effect at a Regional scale The removal of carline thistle (<i>Carlina vulgaris</i>), wild strawberry (<i>Fragaria vesca</i>), quaking grass (<i>Briza media</i>) and eye bright (<i>Euphrasia officinalis</i>) the removal of these would result in a Permanent, Negative (Not Significant) Effect at a Local scale	Compensatory planting through translocation and sowing seeds of the notable plants	Permanent, Positive Residual Effect at a National scale. (Significant)
		Disturbance through trampling, dust deposition, pollution events and additional runoff.	Temporary, Negative (Not Significant) Effect at a Local and Regional scale.	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP⁵	
		As a result of the proposals approximately 388 m ² of hardstanding will be broken up and given back to nature which	Permanent, Positive (Not Significant) Effect at a Local and Regional scale.	n/a	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		will therefore expand the opportunities for these plants to grow			
	Nature reserve	Disturbance through trampling, dust deposition, pollution events and additional runoff.	Negative (Significant) Effect at a Local, Regional and International scale.	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP⁵Error! Bookmark not defined.	Permanent, Positive Residual Effect at a Local to International scale (Significant)
		n/a	n/a	- Narrow and formalise the existing footpath - restrict access to vehicles allowing habitats under existing unofficial car parks to recover therefore expanding the opportunities for these plants to grow	
	Visitor Centre	Scrub clearance to facilitate the development of the building and car park. Killing and/of injury of common nesting birds and destruction of nests	Negative (Significant) Effect within the Zone of Influence only for common passerine birds	- Seasonal timing of clearance to avoid nesting bird (March-August, inclusive) - Or Suitably Qualified Ecologist confirms absence of nesting	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Breeding birds		Loss of scrub nesting habitat available due to the development.	Permanent, Negative (Not Significant) Effect within the Zone of Influence only	Enhancement and planting of scrub habitat across the nature reserve	
	Nature reserve	Indirect disturbance from increased noise, vibration and pollution events to the qualifying species, breeding tern and gull colonies and Schedule 1 species of birds.	Temporary, Negative (Significant) Effect at an International scale.	Seasonal timing of construction works (including vegetation clearance) in critical areas (e.g. along sea wall, near lagoon) to avoid nesting bird season (March-August, inclusive)	Neutral Residual Effect
Over Wintering Birds	Visitor Centre	Loss of scrub foraging and sheltering habitat for common passerine birds such as greenfinch (<i>Chloris chloris</i>), linnet (<i>Linaria cannabina</i>), dunnoek (<i>Prunella modularis</i>), bullfinch (<i>Pyrrhula pyrrhula</i>) and song thrush (<i>Turdus philomelos</i>)	Permanent, Negative (Not Significant) Effect within the Zone of Influence	n/a	Neutral Residual Effect.
	Nature reserve	Indirect disturbance to the qualifying species through a range of pathways including noise, vibration and pollutant spillage	Temporary, Negative (Significant) Effect at an International scale.	- Higher concentration of works take place outside sensitive season - Acoustic screens	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				• ECoW presence for works during sensitive season	
Natterjack Toads	Visitor Centre	Potential risk for the killing or injuring of natterjack toads as a result of the construction activity on site.	Negative (Significant) Effect at the National scale.	• General best practice set out in section 7.7 • Amphibian Mitigation Plan within the CEMP and LEMP	Neutral Residual Effect
	Nature reserve	Potential risk for the killing or injuring of natterjack toads as a result of the construction activity on site.	Negative (Significant) Effect at the National scale.	• General best practice set out in section 7.7 • Amphibian Mitigation Plan within the CEMP and LEMP	Neutral Residual Effect
Reptiles	Visitor Centre	Potential risk for the killing or injuring of reptiles as a result of the construction activity on site.	Permanent, Negative (Significant) Effect within the Zone of Influence only.	• A specific Reptile Mitigation Plan will be produced which could be incorporated into the CEMP and LEMP as appropriate. • ECOW present during sensitive works	Neutral Residual Effect
	Nature reserve	Potential risk for the killing or injuring of reptiles as a result of the construction activity on site.	Permanent, Negative (Significant) Effect within	• General best practice set out in section 7.8	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
			the Zone of Influence only.	Reptile Mitigation Plan within the CEMP and LEMP	Neutral Residual Effect
		n/a	n/a	Narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling, restrict access to vehicles allowing habitats under existing unofficial car parks to recover and given back to nature which provides more opportunities for reptiles	
Invertebrates	Visitor Centre	Potential risk for the killing or injuring of invertebrates as a result of the construction activity on site.	Temporary, Negative (Not significant) Effect within the zone of influence only.	Habitat compensation through scrub enhancement and planting	Permanent, Positive Residual Effect at a Local to District scale (Significant)
		Approximately 388m ² of hardstanding will be broken up and given back to nature providing more opportunities for invertebrates	Permanent, (Significant) Effect at District scale.	n/a	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
	Nature reserve	Habitat loss in the form of loss of scrub and lowland meadow	Temporary, Negative (Insignificant) Effect within the zone of influence only	Habitat lost will be compensated for and maintained as open habitats to benefit invertebrates	Permanent, Positive Residual Effect at a Local to District scale (Significant)
		n/a	n/a	- Narrow and fence in existing permitted access routes to reduce current trampling impact of pedestrians and dogs. - Reduce current vehicular access/car parking to enable grassland areas to rejuvenate and provide invertebrate habitat	
Amphibians	Visitor Centre	Potential risk for the killing and/or injury of amphibian species such as common toad (<i>Bufo bufo</i>), common frog (<i>Rana temporaria</i>), smooth newt (<i>Lissotriton vulgaris</i>) as a result of the construction activity on site	Negative (Significant) Effect within the Zone of Influence only.	- A specific Amphibian Mitigation Plan will be produced which could be incorporated into the CEMP and LEMP as appropriate. - ECOW present during sensitive works	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
	Nature reserve	Potential risk for the killing and/or injury of amphibian species such as common toad, common frog, smooth newt as a result of the construction activity on site	Negative (Significant) Effect within the Zone of Influence only.	- A specific Amphibian Mitigation Plan will be produced which could be incorporated into the CEMP and LEMP as appropriate. - ECOW present during sensitive works	Neutral Residual Effect
Bats	Visitor Centre	Scrub clearance may reveal trees and trees with roosting features in trees within areas of currently dense scrub. The clearance of trees with roosting features could result in the killing and injury of bats, and loss of roosts/potential roosts	Negative (Significant) Effect at the Local scale.	- Clearance done with presence of ECoW - Any bat features be identified then works will cease and the SQE will carry out a bat endoscopy survey - CEMP to include daylight working hours and measures to avoid light spill if necessary	Neutral Residual Effect
	Nature reserve	Scrub clearance may reveal trees and trees with roosting features in trees within areas of currently dense scrub. The clearance of trees with roosting features could result in the killing and injury of	Negative (Significant) Effect at the Local scale.	- Clearance done with presence of ECoW - Any bat features be identified then works will cease and the SQE will carry out a bat endoscopy survey	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		bats, and loss of roosts/potential roosts		CEMP to include daylight working hours and measures to avoid light spill if necessary	
Badgers (Meles meles)	Visitor Centre	Presence of a sett in the dense scrub cannot be entirely ruled out. Scrub clearance and excavation works therefore have the potential to result in destruction of setts/harm to badgers	Negative (Significant) Effect at the Local scale.	Clearance done with presence of ECoW. Works will be stopped if any potential badger setts found and monitoring will be undertaken to determine any licence requirements	Neutral Residual Effect
	Nature reserve	Presence of a sett in the dense scrub cannot be entirely ruled out. Scrub clearance and excavation works therefore have the potential to result in destruction of setts/harm to badgers	Negative (Significant) Effect at the Local scale.	Clearance done with presence of ECoW. Works will be stopped if any potential badger holes found and monitoring will be undertaken	Neutral Residual Effect
		Lighting, construction noise/vibration activities, storage of chemicals, felling of trees and creation of trenches/ excavations	Temporary, Negative (Not Significant) Effect within the Zone of Influence only.	CEMP to include daylight working hours and measures to avoid light spill if necessary	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		with potential for disturbance, injury and killing of foraging/commuting badgers.		Trenching and excavations to be covered each night	
		n/a	n/a	- Narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling - Restrict access to vehicles allowing habitats under existing unofficial car parks to recover and given back to nature which provides more opportunities foraging opportunities for badgers	
		During scrub clearance, otters or otter holts could be identified which could result in killing, injury, or disturbance of otters and damage or destroy their breeding sites and resting places	Negative (Significant) Effect at a Local scale.	Scrub clearance done with presence of ECoW. Works will be stopped if any signs of riparian mammals detected and monitoring will be undertaken	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Riparian Mammals	Visitor Centre	Lighting, construction noise/ vibration activities, storage of chemicals, felling of trees and creation of trenches/ excavations with potential for disturbance, injury and killing of otters	Temporary, Negative (Significant) Effect at a Local scale.	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP¹	
	Nature reserve	During scrub clearance, otters or otter holts could be identified which could result in killing, injury, or disturbance of otters and damage or destroy their breeding sites and resting places	Negative (Significant) Effect at a Local scale.	Scrub clearance done with presence of ECoW. Works will be stopped if any signs of riparian mammals detected and monitoring will be undertaken	Neutral Residual Effect
		Lighting, construction noise/ vibration activities, storage of chemicals, felling of trees and creation of trenches/ excavations with potential for disturbance, injury and killing of otters	Temporary, Negative (Significant) Effect at a Local scale.	- Following General Best Practice in Section 7.1 of this report - Follow procedures set out within the CEMP. Error! Bookmark not defined.	
	Visitor Centre	Clearance of scrub may lead to the killing or injuring of hedgehog	Negative (Significant) Effect within the Zone of Influence only.	- Scrub vegetation will be cleared in a phased manner - In the event that hedgehogs are found, the ECoW will remove	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Hedgehog				them and place them in suitable habitat that is earmarked for retention	
	Nature reserve	Clearance of scrub may lead to the killing or injuring of hedgehog	Negative (Significant) Effect within the Zone of Influence only.	- Any scrub vegetation will be cleared in a phased manner - Clearance done with presence of ECoW - In the event that hedgehogs are found, the ECoW will remove them and place them in suitable habitat that is earmarked for retention	Neutral Residual Effect
Operational					
Designated Sites (SPA, SAC,	Visitor Centre	Increased runoff and foul water onto site	Permanent, Negative (Significant) Effect at an International scale	All surface water drainage from car park and building will firstly go into attenuation/treatment tanks under the car park and coach park area and then will be discharged into the old Red Hills quarry off-site to the north	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Ramsar, SSSI)				Foul water will be pumped off-site into the existing United Utilities drain	
	Nature reserve	Recreational pressure in the form of human disturbance to qualifying species	Permanent, Negative (Significant) Effect at an International scale	- Fortify and extend the existing bund along the sea wall BOAT - Restrict vehicular access along the BOAT to emergency and maintenance vehicles only and as such reduce opportunities for anti-social driving along the BOAT - Reduce access for kayakers and paddle boarders - Provision of signs raising awareness and informing on the importance and rarity of plants - Continued presence of tern warden - Additional island creation for nesting	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		Recreational pressure causing degradation to qualifying habitats through activities such as additional footfall, littering and invasive species introduction, increase in fly tipping.	Permanent, Negative (Significant) Effect at an International scale	- Formalising paths to discourage visitors from trampling sensitive habitats - Provision of signs informing visitors on the importance and rarity of the habitats present - Provision of dog waste bins and litter bins - On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species	
Habitats	Visitor Centre	Recreational pressure from increased human presence / activities could result in habitat degradation through trampling from footfall, introduction of invasive species, increase in fly tipping.	Permanent, Negative (Significant) Effect at a National to International scale.	- Provision of signs informing visitors on the importance and rarity of habitats - Scrub buffer planting around car parks and access drives - Provision of dog waste bins and litter bins - On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species	Neutral Residual Effect

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		Increase in eutrophication of the retained Annex I and priority habitat through dog faeces and reactive nitrogen deposition from cars parking	Permanent, Negative (Not Significant) Effect at a National to International scale.	- Scrub buffer planting around car parks and access drives - Provision of dog waste bins	
		n/a	n/a	The proposals will bring long-term management to the site for a period of at least 30 years	
	Nature reserve		Permanent, Positive (Significant) Effect at a Regional, National and International scale.	- Narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling - Restrict access to vehicles allowing habitats under existing unofficial car parks to recover therefore expanding the opportunities for habitats to expand	Permanent, Positive Residual Effect ranging from between Local and International scale (Significant).
		Habitat degradation through trampling from footfall, introduction of invasive species,	Permanent Negative (Significant) Effect at an International scale.	Narrow and formalise the existing footpath whose surrounding	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		increase in fly tipping and increase in eutrophication through dog faeces..	Impacts to the remaining priority habitats on site would result in a Permanent Negative (Significant) Effect at a National scale.	habitats is subject to extensive trampling • Provision of signs informing on the importance and rarity of habitats • Provision of dog waste bins and litter bins • On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species	
		The proposals will bring long-term management to the site for a period of at least 30 years.	Permanent, Positive (Significant) Effect at a Regional, National, and International scale.	n/a	
Notable Plants	Visitor Centre	Disturbance and killing of notable plants on site through trampling from footfall, introduction of invasive species outcompeting for resources, increase in eutrophication through dog	Permanent Negative (Significant) Effect at a Local and Regional scale.	• Narrow and formalise the existing footpath whose surrounding habitats is subject to extensive trampling • Provision of signs informing on the importance and rarity of plants.	Neutral Residual Effect.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		faeces and reactive nitrogen deposition from cars parking.		- Provision of dog waste bins and litter bins - On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species.	
		n/a	n/a	The proposals will bring long-term management for a period of at least 30 years.	
	Nature reserve	Recreational pressure resulting in habitat degradation on the habitats on site through trampling from footfall, introduction of invasive species, increase in fly tipping and increase in eutrophication through dog faeces.	Permanent Negative (Significant) Effect at a Local, National and International scale.	- Formalising paths to discourage visitors from trampling sensitive habitats. - Provision of signs raising awareness and informing on the importance and rarity of plants. - Provision of dog waste bins and litter bins. - On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species.	Permanent, Positive Residual Effect on notable plant communities ranging from between Local and International scale.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		n/a	n/a	Long-term management to the site for a period of at least 30 years.	
Breeding bird	Visitor Centre	None.	Negligible (Not Significant)	n/a	Neutral Residual Effect.
	Nature reserve	Proposals estimate peaks of 50 visitors per hour over the course of a day during peak periods (school holidays, warm weather). The increase in visitors has potential to increase the frequency of human disturbance to breeding terns and gulls. Increase in visitors could increase existing antisocial behaviour along the BOAT such as racing causing noise and visual disturbance and fly tipping into lagoon	Permanent Negative (Significant) Effect at an International scale.	- Fortify and extend the existing bund along the sea wall BOAT to prevent access to lagoon edge and screen visitors from birds using the lagoon. - Restrict vehicular access along the BOAT to emergency and maintenance vehicles only to reduce the overall vehicular traffic and opportunities for anti-social activities along the BOAT. - Reduce access for kayakers and paddle boarders to the lagoon . - Provision of signs raising awareness and informing on the	Neutral Residual Effect.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				importance of the breeding bird colonies. Continued presence of tern warden.	
Overwintering birds	Visitor Centre	None.	Negligible (Not Significant).	n/a	Neutral Residual Effect.
	Nature reserve	The site is already subject to some disturbance from site users however the proposals will seek to increase visitors which is predicted to equate to 219 people each day if spread evenly across the year. Increase in visitors could increase existing antisocial behaviour along the BOAT such as racing causing noise and visual disturbance and fly tipping into lagoon	Permanent Negative (Significant) Effect at an International scale.	- Fortify and extend the existing bund along the sea wall BOAT - Restrict vehicular access along the BOAT to emergency and maintenance vehicles only and as such reduce opportunities for anti-social activities along the BOAT. - Reduce access for kayakers and paddle boarders to the lagoon. - Provision of signs raising awareness and informing on the importance of the overwintering bird assemblages.	Neutral Residual Effect.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Natterjack toad	Visitor Centre	None.	Negligible (Not Significant).	n/a	Neutral Residual Effect.
	Nature reserve	Increased disturbance and harm from people and dogs.	Permanent Negative (Not Significant) Effect at a National scale.	- Monitor fencing around pools and repair when necessary - Restrict vehicular access along the BOAT to emergency and maintenance vehicles only and as such reduces chances of natterjacks being runover - Formalisation of paths - Signage will be also used to provide information about their ecology, identification tips and give a deeper understanding of natterjack toads. - Increased refugia across the site.	Neutral Residual Effect.
Reptiles	Visitor Centre	Increased disturbance and harm from people and dogs to reptiles present in habitat onsite and in the near surrounds (Zone of Influence).	Permanent Negative (Not Significant) Effect at a Local scale.	Formalising paths to discourage visitors from trampling on surrounding suitable reptile habitat	Neutral Residual Effect.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				- Signage will be also used to provide information about their ecology, identification tips and give a deeper understanding of the reptiles present. - Increased refugia across the site in locations where walkers and dogs will be discouraged.	
	Nature reserve	Increased disturbance and harm from people and dogs.	Permanent Negative (Not Significant) Effect at a Local scale.	- Formalising paths to discourage visitors from trampling surrounding suitable reptile habitat - Signage will be also used to provide information about their ecology, identification tips and give a deeper understanding of the reptiles present. - Increased refugia across the site.	Neutral Residual Effect.
Invertebrates	Visitor Centre	n/a	n/a	The development ensures the long-term management commitment to habitats that	Permanent, Positive effect at District Level (Significant).

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				would otherwise scrub over and result in a homogenous habitat	
	Nature reserve	n/a	n/a	The development ensures the long-term management commitment to habitats that would otherwise scrub over and result in a homogenous habitat	Permanent, Positive effect at District Level (Significant).
Amphibians	Visitor Centre	Increased disturbance and harm from people and dogs	Permanent Negative (Not Significant) Effect at a Local scale.	- Formalising paths to discourage visitors from trampling surrounding suitable amphibian habitat - Signage will be also used to provide information about amphibian ecology, identification guides - New refugia across the site to offer an increase in habitat	Neutral Residual Effect.
	Nature reserve	Increased disturbance and harm from people and dogs	Permanent Negative (Not Significant) Effect at a Local scale.	Monitor fencing around pools and repair when necessary	Neutral Residual Effect.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				- Formalising paths to discourage visitors from trampling surrounding suitable amphibian habitat - Signage will be also used to provide information about amphibian ecology, identification guides - New refugia across the site to offer an increase in habitat	
Bats	Visitor Centre	Lighting scheme with increased, uncontrolled upward light spill, disturbing, reducing or excluding foraging or commuting bats from lit areas.	Permanent Negative (Insignificant) Effects at a Local scale.	A bat sensitive lighting strategy will be in place subject to curfews and motion sensors.	Neutral Residual Effect.
	Nature reserve	None	Negligible (Not Significant).	n/a	Neutral Residual Effect.
Badgers	Visitor Centre	Increased disturbance from increased numbers of visitors and dogs	Negligible (Not Significant).	Formalising paths to discourage visitors from trampling	Neutral Residual Effect.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				surrounding suitable badger habitat	
	Nature reserve	None	Negligible (Not Significant).	n/a	Neutral Residual Effect.
Riparian Mammals	Visitor Centre	None	Negligible (Not Significant).	n/a	Neutral Residual Effect.
	Nature reserve	Increased disturbance from increased numbers of visitors and dogs	Permanent, Negative (Not Significant) Effect at a Local scale.	- Enhancement of scrub habitat on the lagoon edge leaving opportunities for otters to shelter. - Restricted access of cars along BOAT - Fortify and extend the existing bund along the sea wall BOAT	Neutral Residual Effect.
Hedgehog	Visitor Centre	None	Negligible (Not Significant).	n/a	Neutral Residual Effect.

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
	Nature reserve	None	Negligible (Not Significant).	n/a	Neutral Residual Effect.

13.0 SUMMARY & CONCLUSION

Greengage Environmental Ltd was commissioned to undertake an Ecological Impact Assessment (EclA) by Cumberland Council of a site known as Hodbarrow Nature Reserve, Millom on the South-west coast of Cumbria.

This EclA and PEA Update incorporates the results of the Phase II Surveys completed in 2021 and 2022 by Appletons and third party ecology contractors and carried out to support an planning submission for the site which seeks *“Erection of visitor centre with café/shop, group room, staff/volunteer, toilet facilities and vehicle parking; consolidation, repair and installation of interpretive sculpture to Towsey Hole Windmill; refurbishment of existing Tern Island Hide; new bird hides, pathways, gateway features, street furniture, and demarcation of spaces at existing car park; enhancement of wildlife habitats; associated landscaping and drainage infrastructure; and maintenance of byway with restricted vehicular access -The Iron Line Project.”*

These surveys aimed to establish the ecological value of the development areas of the site and the presence/likely-absence of notable and/or legally protected species in order to inform appropriate mitigation, compensation and enhancement actions in light of proposed development works.

In light of the survey findings an assessment of potential impacts has been made for each development at the construction and operational stages. Recommendations for mitigation actions have been made within this report to minimise the identified impacts. Compensation and enhancement actions have also been described in order to ensure that residual impacts of each development is minimised on each of the identified ecological receptors.

Key actions will be included within LEMP and CEMP documents for the site which could be secured through planning condition.

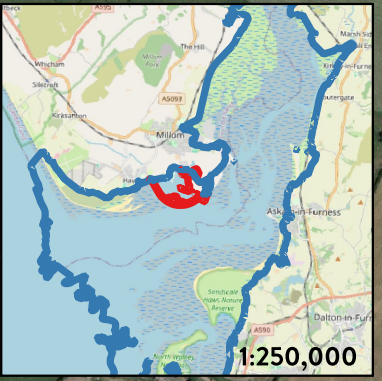
Upon successful implementation of all mitigation compensation and enhancement measures the development proposals will result in either neutral or positive residual impacts on the specified ecological receptors during both the construction and operational phase of the development, and proposals are in full compliance with legislation and policy surrounding the protection of protected habitats and species.

A BNGA has been undertaken using the SBM which confirms, with the appropriate incorporation of the landscaping features, that the development overall will lead to a 10% net gain in biodiversity value post development. See the BNGA report for further details (ref: 553023lt09Apr25FV01_BNGA).

APPENDIX A SITE PLAN

IRON LINE

-  Planning application boundary
-  Visitor Centre and car park site.



Title: Figure A1.1

Drawn by: LT
Date: 09/04/2025

Reviewed by: HB
Date: 09/04/2025

Project number: 553023
Sources: Google Satellite, OpenStreetMap

IRON LINE

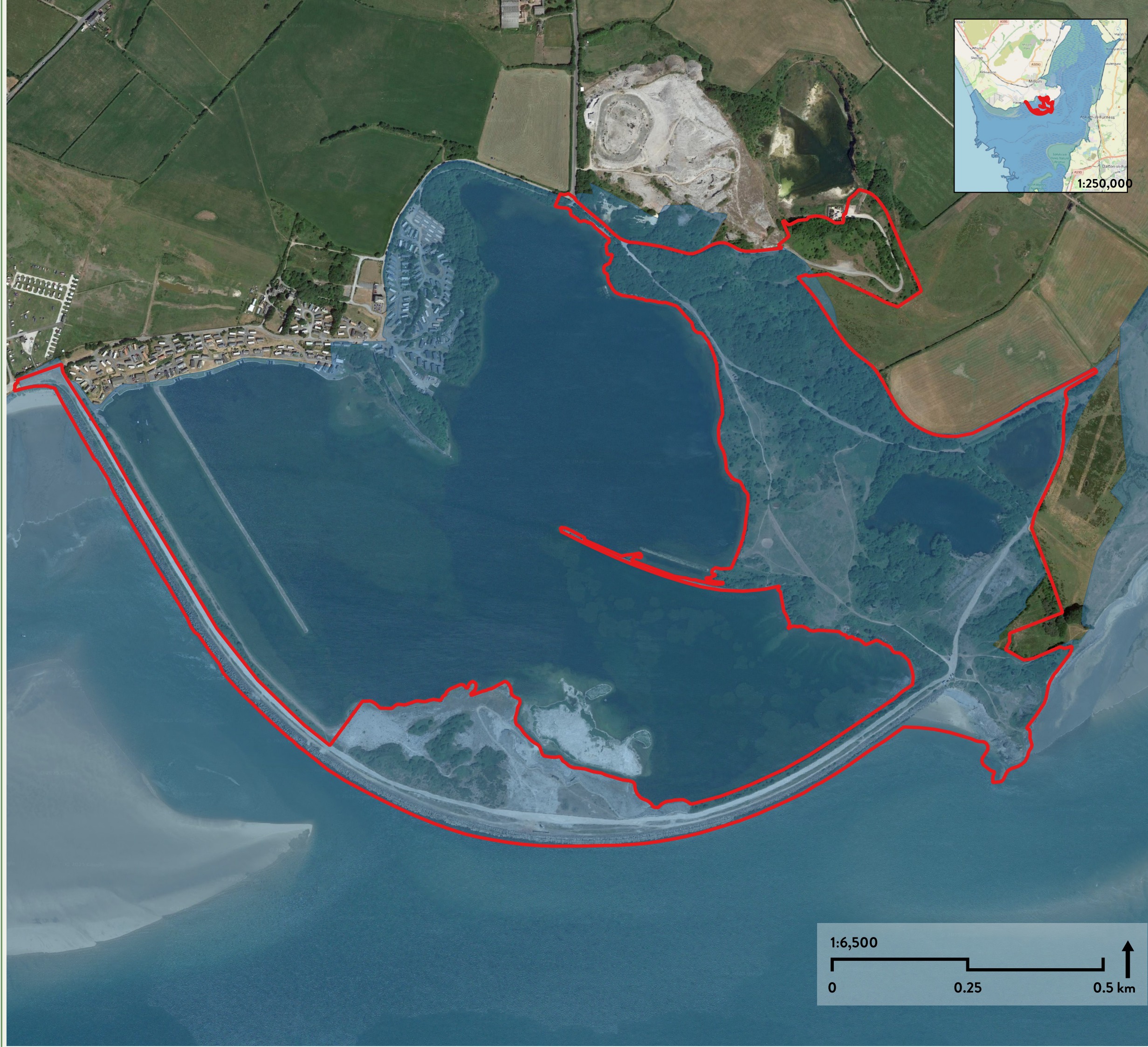
-  Planning application boundary
-  Designated site boundary

Title: Figure A2

Drawn by: LT
Date: 09/04/2025

Reviewed by: HB
Date: 09/04/2025

Project number: 553023
Sources: Google Satellite and OpenStreetMap



APPENDIX B RELEVANT LEGISLATION AND POLICY

B.1 LEGISLATION

Current key legislation relating to ecology includes The Environment Act⁴⁵ Wildlife and Countryside Act 1981 (as amended)⁴⁶; The Conservation of Habitats and Species Regulations 2019 ('Habitats & Species Regulations')⁴⁷, The Countryside and Rights of Way Act 2000 (CRoW Act)⁴⁸, and The Natural Environment and Rural Communities Act, 2006⁴⁹.

The Environment Act, 2021

The Environment Act, 2021 has mandated the requirement for new development in England to deliver a minimum 10% biodiversity net gain (BNG), as measured by the Statutory Biodiversity Metric, secured through planning condition as standard (as per schedule 14 of the Act). Approach to the delivery of BNG must follow the mitigation hierarchy, with avoidance of impact and on-site compensation/gains prioritised, ahead of the use of offsite biodiversity unit offsets, or the purchase of biodiversity credits.

The Act introduces the condition that no development may begin unless a biodiversity net gain plan has been submitted and approved by the local planning authority (LPA).

The Act also amends requirements of the NERC Act, 2006, adding the need to not just conserve, but enhance biodiversity through planning projects. Furthermore, it introduces the need for the LPA to have regard to relevant local nature recovery strategies and relevant species/protected site conservation strategies, when making their decision.

Under the Act, the enhancements must be maintained for at least 30 years.

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019

The Conservation of Habitats & Species Regulations replace The Conservation (Natural Habitats, etc.) Regulations 1994 (as amended)⁵⁰, and transpose Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora ('EU Habitats Directive')⁵¹, and Council Directive 79/409/EEC on the Conservation of Wild Birds ('Birds Directive')⁵² into UK law (in conjunction with the Wildlife and Countryside Act).

Regulation 43 and 47 respectively of the Conservation of Habitats & Species Regulations makes it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2 (European protected species of animals), or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 5 (European protected species of plant). Development that would contravene the protection afforded to European protected species requires a derogation (in the form of a licence) from the provisions of the Habitats Directive.

Regulation 63 (1) states: 'A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which —

(a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects); and

(b) is not directly connected with or necessary to the management of that site;

must make an appropriate assessment of the implications for that site in view of that site's conservation objectives.'

Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act 1981 (as amended) is the principal mechanism for the legislative protection of wildlife in Great Britain. This legislation is the means by which the Convention on the Conservation of European Wildlife and Natural Habitats⁵³ (the 'Bern Convention') and the Birds Directive and EU Habitats Directive are implemented in Great Britain.

The Countryside and Rights of Way Act 2000

The Wildlife and Countryside Act has been updated by the CROW Act. The CROW Act amends the law relating to nature conservation and protection of wildlife. In relation to threatened species it strengthens the legal protection and adds the word 'reckless' to the offences of damaging, disturbing, or obstructing access to any structure or place a protected species uses for shelter or protection, and disturbing any protected species whilst it is occupying a structure or place it uses for shelter or protection.

The Natural Environment and Rural Communities Act 2006

The Natural Environment and Rural Communities Act 2006 states that every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity. Biodiversity Action Plans provide a framework for prioritising conservation actions for biodiversity.

Section 41 of the Natural Environment and Rural Communities Act requires the Secretary of State to publish a list of species of flora and fauna and habitats considered to be of principal importance for the purpose of conserving biodiversity. The list, a result of the most comprehensive analysis ever undertaken in the UK, currently contains 1,149 species, including for example, hedgehog (*Erinaceus europaeus*), and 65 habitats that were listed as priorities for conservation action under the now defunct UK Biodiversity Action Plan⁵⁴ (UK BAP). Despite the devolution of the UK BAP and succession of the UK Post-2010 Biodiversity Framework⁵⁵ (and Biodiversity 2020 strategy⁵⁶ in England), as a response to the Convention on Biological Diversity's (CBD's) Strategic Plan for Biodiversity 2011-2020⁵⁷ and EU Biodiversity Strategy (EUBS)⁵⁸, this list (now referred to as the list of Species and Habitats of Principal Importance in England) will be used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 41 of the Natural Environment and Rural Communities Act 2006 'to have regard' to the conservation of biodiversity in England, when carrying out their normal functions.

Biodiversity Action Plans

Non-statutory Biodiversity Action Plans (BAPs) have been prepared on a local and regional scale throughout the UK over the past 15 years. Such plans provide a mechanism for implementing the government's broad strategy for conserving and enhancing the most endangered ('priority') habitats and species in the UK for the next 20 years. As described above the UK BAP was succeeded in England by Biodiversity 2020 although the list of priority habitats and species remains valid as the list of Species of Principal Importance for Nature Conservation.

Regional and local BAPs are still valid however and continue to be updated and produced.

Detail on the relevant BAPs for this site are provided in the main text of this report.

Legislation Relating to Nesting Birds

Nesting birds, with certain exceptions, are protected from intentional killing, destruction of nests and destruction/taking of eggs under the Wildlife and Countryside Act 1981 (as amended) and the CROW Act. Any clearance of dense vegetation should therefore be undertaken outside of the nesting bird season, taken to run conservatively from March to August (inclusive), unless an ecologist confirms the absence of active nests prior to clearance.

Legislation Relating to Bats

All UK bats and their roosts are protected by law. Since the first legislation was introduced in 1981, which gave strong legal protection to all bat species and their roosts in England, Scotland and Wales, additional legislation and amendments have been implemented throughout the UK.

Six of the 18 British species of bat have Biodiversity Action Plans (BAPs) assigned to them, which highlights the importance of specific habitats to species, details of the threats they face and proposes measures to aid in the reduction of population declines.

Although habitats that are important for bats are not legally protected, care should be taken when dealing with the modification or development of an area if aspects of it are deemed important to bats such as flight corridors and foraging areas.

The Wildlife & Countryside Act 1981 (WCA) was the first legislation to provide protection for all bats and their roosts in England, Scotland and Wales (earlier legislation gave protection to horseshoe bats only.)

All eighteen British bat species are listed in Schedule 5 of the Wildlife and Countryside Act, 1981 and under Annex IV of the Habitats Directive, 1992 as a European protected species. They are therefore fully protected under Section 9 of the 1981 Act and under Regulation 43 of the Conservation of Habitats and Species Regulations 2017, which transposes the Habitats Directive into UK law.

Consequently, it is an offence to:

- Deliberately capture, injure or kill a bat;
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;

- Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat; and
- Intentionally or recklessly obstruct access to a bat roost.

This legislation applies to all bat life stages.

The implications of the above in relation to the proposals are that where it is necessary during construction to remove trees, buildings or structures in which bats roost, it must first be determined that work is compulsory and if so, appropriate licenses must be obtained from Natural England.

Legislation Relating to Reptiles

All species of reptile native to the UK are protected to some degree under national and/or international legislation, which provides mechanisms to protect the species, their habitats and sites occupied by the species.

Sand lizards and smooth snakes are European protected species and are afforded full protection under Section 9 of the Wildlife and Countryside Act 1981 and Regulation 43 of the Conservation of Habitats and Species Regulations 2017. However, these species are rare and highly localised. Their occurrence is not considered as relevant in this instance, as the ranges and specialist habitats of these species do not occur at this site.

The remaining widespread species of native reptiles (adder, grass snake, slow worm and viviparous lizard) are protected under part of Section 9(1) and all of Section 9(5) of the Wildlife and Countryside Act 1981. They are protected against intentional killing and injury and against sale, transporting for sale etc. The habitat of these species is not protected. However, in terms of development, disturbing or destroying reptile habitat during the course of development activities while reptiles are present is likely to lead to an offence under the Wildlife and Countryside Act 1981. It is therefore important to identify the presence of these species within a potential development site. If any of these species are confirmed, all reasonable measures must then be taken to ensure the species are removed to avoid the threat of injury or death associated with development activities.

Each species of native reptile has specific habitat requirements but general shared features include a structurally diverse habitat that provides for shelter, basking, foraging and hibernating.

All reptiles are BAP species and as such are also of material consideration in the planning process due to the NPPF.

Legislation Relating to Natterjack Toads

Natterjack Toads are a European Protected Species (EPS) listed under Schedule 2 of the Conservation of Habitats and Species Regulations 2019 (EU Exit) (as amended), and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), as well as recognised as a species of national conservation importance under section 41 (S.41) of the Natural Environment Rural Communities Act 2006 (NERC Act) - England.

Specifically, the existing legal framework makes it illegal to:

- Intentionally or deliberately capture, injure or kill a Natterjack Toad,
- Damage or destroy a breeding or resting place of a Natterjack Toad, or intentionally or recklessly damage or destroy any structure or place used for shelter or protection,
- Intentionally or recklessly disturb a Natterjack Toad in a place used for shelter or protection, or deliberately disturb Natterjack Toad in such a way as to be likely significant to affect (i) the ability of any significant group to survive, breed, rear or nurture their young, or (ii) the local distribution or abundance,
- Intentionally or recklessly obstruct access to a place used for shelter or protection,
- Possess a Natterjack Toad (alive or dead), or any part of a Natterjack Toad.

B.2 PLANNING POLICY

National

National Planning Policy Framework

The National Planning Policy Framework (NPPF) 2024⁵⁹ sets out the Government's planning policies for England, including how plans and decisions are expected to apply a presumption in favour of sustainable development. Chapter 15 of the NPPF focuses on conservation and enhancement of the natural environment, stating plans should 'identify and pursue opportunities for securing measurable net gains for biodiversity'.

It goes on to state: 'if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused'. Alongside this, it acknowledges that planning should be refused where irreplaceable habitats such as ancient woodland are lost.

Regional

Copeland Local Plan⁶⁰

Policy DS7: Sustainable Drainage

New development must incorporate Sustainable Drainage Systems unless it can be demonstrated that this is not appropriate. Drainage systems should be well designed with consideration given to the additional benefits they can provide as spaces for landscape, biodiversity and recreation.

Development on greenfield sites should seek to achieve pre-development or better levels of surface water run-off and on previously developed sites, a reduction in surface water discharge should be sought. In demonstrating a reduction clear evidence of existing connections from the site and associated rates of discharge calculations should be provided. In both cases, measures should be put in place to prevent pollution entering watercourses with surface water managed at source. Where identified on the local validation list applicants should submit a Drainage Strategy that shows how foul

and surface water will be effectively managed and maintained. Where SuDS are being incorporated details of their long-term management should be provided. This will be secured through the use of s106 agreements. Surface water should be discharged in the following order of priority:

1. To a suitable soakaway or some other form of infiltration system
2. An attenuated discharge to a surface water body such as a watercourse giving full consideration to the catchment and sub-catchments
3. An attenuated discharge to a public surface water sewer, highway drain or another discharge system where there is clear evidence, to the satisfaction of the Council, that alternative preferred options are not available
4. An attenuated discharge to a public combined sewer where there is clear evidence, to the satisfaction of the Council, that alternative preferred options are not available

Strategic Policy T1: Tourism Development

The Local Plan will support the creation, enhancement and expansion of tourist attractions, new build visitor accommodation and infrastructure in locations consistent with the settlement hierarchy. All tourism development must be of an appropriate scale, located where the environment and infrastructure can accommodate the visitor impact, and where it does not result in unacceptable harm to environmental assets (including landscapes, heritage assets and biodiversity) or the character of the area. Proposals for tourism development outside of defined settlements will be supported where:

- The proposal is for a specific activity or function that requires such a location; or
- The proposal enhances Copeland's existing place bound assets; or
- The proposal is for the change of use, or diversification of an existing building, to provide overnight or longer stay visitor accommodation; or
- The proposal is for a farm diversification scheme in a rural area that will provide or enhance tourist provision.

Policy T2: Tourism Development along the Developed Coast

Opportunities for tourist development in close proximity to the coastline (with the exception of areas designated as undeveloped coast) of an appropriate type and scale will be supported in principle where the proposal:

- a) Provides improved accessibility to the coastal walkways and cycle routes; or
- b) Improves the quality and range of holiday accommodation including overnight tourist provision; or
- c) Creates or enhances gateways and/or hubs; or
- d) Enhances the offer for both onshore and offshore visitors at Whitehaven Harbour including provision for the docking of cruise ships; or
- e) Provides opportunities to enhance the tourism offer in South Copeland.

In all circumstances development should be of an appropriate scale located where the environment and infrastructure can accommodate the visitor impact, and where it does not result in unacceptable harm to environmental assets including landscapes, heritage assets, and biodiversity. All development should ensure local landscape character is maintained and avoid detrimental impacts on setting of Heritage Coast.

Strategic Policy N1: Conserving and Enhancing Biodiversity and Geodiversity

The Council is committed to conserving Copeland's biodiversity and geodiversity including protected species and habitats.

Potential harmful impacts of any development upon biodiversity and geodiversity must be identified and considered at the earliest stage

Proposals must demonstrate, to the satisfaction of the Council, that the following mitigation hierarchy must have been undertaken:

Avoidance – Biodiversity and geodiversity must be considered when drafting up proposals and any potential harmful effects on biodiversity and geodiversity must be identified along with appropriate measures that will be taken to avoid these effects.

Mitigation – Where harmful effects cannot be avoided, they must be appropriately mitigated in order to overcome or reduce negative impacts.

Compensation – Where mitigation is not possible or viable or in cases where residual harm would remain following mitigation, harmful effects should be compensated for. Where this is in the form of compensatory habitat an area of equivalent or greater biodiversity value should be provided.

Compensation is a last resort and will only be accepted in exceptional circumstances.

Where harm remains to a National Site Network, Ramsar site, or functionally linked land, or Site of Special Scientific Interest, development will only be approved where it can be demonstrated that there are imperative reasons of overriding public interest. In such cases, compensatory measures must ensure the overall coherence of the network of European or National Sites as a whole is protected.

Planning permission will be refused for any development if significant harm cannot be avoided, mitigated or compensated for.

A Construction Environmental Management Plan should be submitted where appropriate and sustainable construction methods must be used where possible.

Development proposals where the principal objective is to conserve or enhance biodiversity and geodiversity interests will be supported in principle.

Strategic Policy N2: Local Nature Recovery Networks

The Council will support the identification, implementation, protection and enhancement of Local Nature Recovery Networks that provide important linkages for wildlife within Copeland and beyond. Development which protects or enhances Local Nature Recovery Networks will be supported in principle.

Strategic Policy N3: Biodiversity Net Gain

All development, with the exception of that listed in the Environment Act 2021 and any documents which may supersede it must provide at least 10% biodiversity net gain over and above existing site levels, following the application of the mitigation hierarchy set out in Policy N1 above. This is in addition to any compensatory habitat provided under Policy N1.

Net gain should be delivered on site where possible. Where on-site provision cannot be achieved in full, the remaining provision must be made elsewhere. This should be provided in order of the following preference:

- Off site in an area identified as a Local Nature Recovery Network in the Plan area;
- Off site on an alternative suitable site within Cumberland ;
- Off-site on an alternative suitable site;
- Through the purchase of off-site biodiversity units on the market;
- Through the purchase of an appropriate amount of national biodiversity credits.

Sites where net gain is provided (on or off site) must be managed and monitored by the landowner for a minimum period of 30 years. Where appropriate applicants should supply a Habitat Creation Plan and a Habitat Management and Monitoring Plan (HMMP). Monitoring reports detailing the site's condition post-enhancement must be submitted to the Council each year over this period.

Where there is evidence of deliberate neglect or damage to any of the habitats on development sites in order to reduce its biodiversity value the biodiversity predevelopment value of the onsite habitat will be calculated as the biodiversity value of the habitat on the date immediately before the degradation took place.

Strategic Policy N8: The Undeveloped Coast

The Council will ensure that the landscape character of the undeveloped coast is maintained by conserving the intrinsic qualities, natural beauty and open character of the undeveloped coast from inappropriate development. Inappropriate development includes that which affects views within or towards/from the St Bees and Whitehaven Heritage Coast. The following types of development will however be supported:

- Development which supports the management of the undeveloped coast for biodiversity;
- Development which provides or improves safe access to and interpretation of the undeveloped coast for residents and visitors such as appropriate fencing, signage and interpretation boards;
- Energy generating developments that that require a coastal location along the undeveloped coast, provided that the potential impacts on biodiversity, landscape and heritage assets are carefully assessed against the benefits. Where negative impacts are likely these must be mitigated against and compensated for.

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