



**Brighter strategies**  
for greener projects



**Client:** Cumberland Council  
**Project:** Iron Line  
**Report:** Ecological Impact Assessment

## QUALITY ASSURANCE

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## 1.0 EXECUTIVE SUMMARY

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 document has been carried out to support a planning submission for the site which seeks *"erection of welcome building with café, retail space, staff facilities and car park, repair and stabilisation works at Hodbarrow Beacon, repair and stabilisation works and installation of 'camera obscura' structure at Towsey Hole Windmill, installation of cladding and new living roof to existing bird hide, erection of new bird hides and viewing platforms, creation of new multi-use pathways with signage, gateway features and street furniture, making good of existing byway (BOAT) along sea wall, enhancement of wildlife habitats, and associated access, landscaping and drainage infrastructure."*

The site lies approximately 0.6km south of the town of Millom and 0.8km east of the village of Haverigg. The proposals form part of the Haverigg and Millom's Town Investment Plan. The Plan received a grant from the Government's 'Towns Fund' and aims to foster economic regeneration, stimulate investment, and deliver vital infrastructure back into the towns. The proposals seek to create a multi-sensory experience across the nature reserve through the enhancement of existing ecological features and priority habitats with provision of features of interest in the form of sculptures and art installations that reflect on the unique heritage of the site. 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 Welcome Building 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 150,000.

The Hodbarrow Nature Reserve site is part of the Morecambe Bay and Duddon Estuary Special Protection Area (SPA), Special Area of Conservation (SAC), Ramsar site and is itself a Site of Special Scientific Interest (SSSI). The wider bay 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 species present include great crested newts (*Triturus cristatus*), natterjack toads (*Epidalea calamita*), rare and nationally scarce invertebrate species and at least one nationally scarce plant.

The wider Hodbarrow Nature Reserve site extends to 105 hectares (ha) and comprises lagoons, grasslands and scrubland. The site is a former iron mine and since 1986 has been owned and managed by the Royal Society for the Protection of Birds (RSPB). The development boundary does not include the Hodbarrow lagoon. The site boundary does however, include an area to the north extending to approximately 2.1 ha comprising hardstanding dense scrub, lowland meadow and calcareous grassland, where the proposed welcome building and associated car parking will be situated. Overall, the site boundary extends to 57.69ha.

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



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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).

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. For the purposes of the reports, the potential impacts and effects associated with the development of the proposed welcome building and associated car parking have been considered separately from the potential impacts and effects associated with the wider site.

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 (CEcMP). These documents are recommended to be secured by planning condition. The species-specific Mitigation Plans referenced below will be incorporated into these documents as appropriate.

*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	Welcome Building	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
	Wider Site	Increased noise, visual activity and lighting disturbing qualifying breeding and overwintering birds.	Temporary to Permanent, Negative (Significant) Effect at an International Scale	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>	Neutral Residual Effect
		Habitat degradation of 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	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>	
		Loss of 156sqm of 1891sqm of regionally important Priority Lowland Meadow habitat	Permanent Negative (Significant) Effect at a Regional scale.	<ul style="list-style-type: none"> <li>Compensatory lowland meadow planting through translocation and sowing seed mix</li> </ul>	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Habitats	Welcome Building	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.	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>	Permanent, Positive Residual Effect at a National scale (Significant)
		As a result of the proposals 1540m <sup>2</sup> 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	
	Wide Site	Pollution events, increased surface run-off, dust deposition, nitrogen deposition from machinery, trampling from construction workers resulting in	Temporary Negative (Significant) Effect at an International scale for Annex I habitats Temporary Negative (Significant) Effect at an	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		degradation of habitat and spread of invasive species.	International scale for all other habitats		Permanent, Positive Residual Effect ranging from between Local and International scale (Significant)
		The proposals will seek to create and restore approximately 17,012m <sup>2</sup> of vegetation that is currently hardstanding or subject to extensive trampling and enhance 62,085m <sup>2</sup> of existing habitat	Permanent, Positive (Significant) Effect at a Regional to National Scale.	n/a	
Notable Plants	Welcome Building	Loss of notable plant species during the removal of lowland meadow habitat	Loss of fern grass will result in a Permanent, Negative (Not Significant) Effect at a Regional scale The removal of carline thistle, wild strawberry, quaking grass and eye bright the removal of these would result in a Permanent, Negative	<ul style="list-style-type: none"> <li>• Buffer zones around existing plants and retained areas</li> <li>• Compensatory planting through translocation and sowing seeds of the notable plants</li> </ul>	Permanent, Positive Residual Effect at a National scale. (Significant)

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)	
			(Not Significant) Effect at a Local scale			
		Disturbance through trampling, dust deposition, pollution events and additional runoff.	Temporary, Negative (Not Significant) Effect at a Local and Regional scale.	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>		
		Narrow the existing road into the width of a footpath and therefore expanding the opportunities for these plants to grow	Permanent, Positive (Not Significant) Effect at a Local and Regional scale.	n/a		
	Wider Site	Disturbance through trampling, dust deposition, pollution events and additional runoff.	Negative (Significant) Effect at a Local, Regional and International scale.	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>		Permanent, Positive Residual Effect at a Local to International scale (Significant)
		Narrow the existing road into the width of a footpath and therefore expanding the opportunities for these plants to grow	Permanent, Positive (Significant) Effect varying from a Local, National and International 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)
Breeding birds	Welcome Building	Scrub clearance to facilitate the development of the building and carpark. 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	<ul style="list-style-type: none"> <li>Seasonal timing of clearance to avoid nesting bird (March-August, inclusive)</li> <li>Or Suitably Qualified Ecologist confirms absence of nesting</li> </ul>	Neutral Residual Effect
		Loss of scrub nesting habitat available due to the development.	Permanent, Negative (Not Significant) Effect within the Zone of Influence only	<ul style="list-style-type: none"> <li>Enhancement and planting of scrub habitat across the wider site</li> </ul>	
	Wider Site	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.	<ul style="list-style-type: none"> <li>Seasonal timing of on site, and all works in critical areas (e.g. along sea wall, near lagoon) to avoid nesting bird (March-August, inclusive)</li> </ul>	Neutral Residual Effect
Over Wintering Birds	Welcome Building	Loss of scrub foraging and sheltering habitat for common passerine birds.	Permanent, Negative (Not Significant) Effect within the Zone of Influence	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)
	Wider Site	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.	<ul style="list-style-type: none"> <li>Higher concentration of works take place outside sensitive season</li> <li>Acoustic screens</li> <li>ECoW presence for works during sensitive season</li> </ul>	Neutral Residual Effect
Natterjack Toads	Welcome Building	Potential risk for the killing or injuring natterjack toad as a result of the construction activity on site.	Negative (Significant) Effect at the National scale.	<ul style="list-style-type: none"> <li>General best practice set out in section 7.7</li> <li>Amphibian Mitigation Plan within the CEMP and LEMP</li> </ul>	Neutral Residual Effect
	Wider Site	Potential risk for the killing or injuring natterjack toad as a result of the construction activity on site.	Negative (Significant) Effect at the National scale.	<ul style="list-style-type: none"> <li>General best practice set out in section 7.7</li> <li>Amphibian Mitigation Plan within the CEMP and LEMP</li> </ul>	Neutral Residual Effect
Reptiles	Welcome Building	Site clearance in this area has the potential to result in the killing and injury of reptile species	Permanent, Negative (Significant) Effect within the Zone of Influence only.	<ul style="list-style-type: none"> <li>A specific Reptile Mitigation Plan will be produced which could be incorporated into the CEcMP and LEMP as appropriate.</li> <li>ECOW present during sensitive works</li> </ul>	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)
	Wider site	Site clearance in this area has the potential to result in the killing and injury of reptile species	Permanent, Negative (Significant) Effect within the Zone of Influence only.	<ul style="list-style-type: none"> <li>General best practice set out in section 7.8</li> <li>Reptile Mitigation Plan within the CEMP and LEMP</li> </ul>	Neutral Residual Effect
		17,012m <sup>2</sup> of hardstanding and heavily trampled habitat will be given back to nature and enhance 62,085m <sup>2</sup> of existing habitat which provides more opportunities for reptiles	Permanent, (Significant) Effect at Zone of Influence only.	n/a	
Invertebrates	Welcome Building	Loss of scrub and lowland meadow	Temporary, Negative (Not significant) Effect within the zone of influence only.	<ul style="list-style-type: none"> <li>Habitat compensation through scrub enhancement and planting</li> </ul>	Permanent, Positive Residual Effect at a Local to District scale (Significant)
		1540m <sup>2</sup> of hardstanding will be 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)
	Wider Site	Habitat loss in the form of loss of scrub and lowland meadow	Temporary, Negative (Insignificant) Effect within the zone of influence only	<ul style="list-style-type: none"> <li>Habitat lost will be compensated for and maintained as open habitats to benefit invertebrates</li> </ul>	Permanent, Positive Residual Effect at a Local to District scale (Significant)
		17,012m <sup>2</sup> of hardstanding/heavily trampled habitat will be given back to nature and 62,085m <sup>2</sup> of existing habitat will be enhanced, providing more opportunities for invertebrates.	Permanent, Positive (Significant) Effect at Nationalscale.	n/a	
Amphibians	Welcome Building	Site scrub clearance resulting in the killing and injury of amphibian species	Negative (Significant) Effect within the Zone of Influence only.	<ul style="list-style-type: none"> <li>A specific Amphibian Mitigation Plan will be produced which could be incorporated into the CEcMP and LEMP as appropriate.</li> <li>ECOW present during sensitive works</li> </ul>	Neutral Residual Effect
	Wider site	Pockets of scrub clearance resulting in the killing and injury of amphibian species	Negative (Significant) Effect within the Zone of Influence only.	<ul style="list-style-type: none"> <li>A specific Amphibian Mitigation Plan will be produced which could be incorporated into the CEcMP and LEMP as appropriate.</li> </ul>	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)
				<ul style="list-style-type: none"> <li>• ECOW present during sensitive works</li> </ul>	
Bats	Welcome Building	Scrub clearance may reveal 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.	<ul style="list-style-type: none"> <li>• Clearance done with presence of ECoW</li> <li>• Any bat features be identified then works will cease and the SQE will carry out a bat endoscopy survey</li> <li>• CEMP to include daylight working hours and measures to avoid light spill if necessary</li> </ul>	Neutral Residual Effect
	Wider Site	Scrub clearance may reveal 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.	<ul style="list-style-type: none"> <li>• Clearance done with presence of ECoW</li> <li>• Any bat features be identified then works will cease and the SQE will carry out a bat endoscopy survey</li> <li>• CEMP to include daylight working hours and measures to avoid light spill if necessary</li> </ul>	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	Welcome Building	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.	<ul style="list-style-type: none"> <li>Clearance done with presence of ECoW. Works will be stopped if any potential badger holes found and monitoring will be undertaken</li> </ul>	Neutral Residual Effect
	Wider Site	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.	<ul style="list-style-type: none"> <li>Clearance done with presence of ECoW. Works will be stopped if any potential badger holes found and monitoring will be undertaken</li> </ul>	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.	<ul style="list-style-type: none"> <li>CEMP to include daylight working hours and measures to avoid light spill if necessary</li> <li>Trenching and excavations to be covered each night</li> </ul>	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		17,012m <sup>2</sup> of hardstanding /heavily trampled habitat will be given back to nature providing and 62,085m <sup>2</sup> of existing habitat will be enhanced more foraging opportunities for badgers	Permanent, Positive (Not Significant) Effect within the Zone of Influence only.	n/a	
Riparian Mammals	Welcome Building	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.	<ul style="list-style-type: none"> <li>Scrub clearance done with presence of ECoW. Works will be stopped if any signs of riparian mammals detected and monitoring will be undertaken</li> </ul>	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.	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>	
	Wider site	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.	<ul style="list-style-type: none"> <li>Scrub clearance done with presence of ECoW. Works will be stopped if any signs of riparian</li> </ul>	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		<ul style="list-style-type: none"> <li>mammals detected and monitoring will be undertaken</li> </ul>	
		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.	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>	
Hedgehog	Welcome Building	Clearance of scrub may lead to the killing or injuring of hedgehog	Negative (Significant) Effect within the Zone of Influence only.	<ul style="list-style-type: none"> <li>Scrub vegetation will be cleared in a phased manner</li> <li>In the event that hedgehogs are found, the ECoW will remove them and place them in suitable habitat that is earmarked for retention</li> </ul>	Neutral Residual Effect
	Wider Site	Clearance of scrub may lead to the killing or injuring of hedgehog	Negative (Significant) Effect within the Zone of Influence only.	<ul style="list-style-type: none"> <li>Any scrub vegetation will be cleared in a phased manner</li> <li>Clearance done with presence of ECoW</li> </ul>	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)
				<ul style="list-style-type: none"> <li>In the event that hedgehogs are found, the ECoW will remove them and place them in suitable habitat that is earmarked for retention</li> </ul>	
Operational					
Designated Sites	Welcome Building	Increased runoff and foul water onto site	Permanent, Negative (Significant) Effect at an International scale	<ul style="list-style-type: none"> <li>Surface water attenuation with a combination of permeable paving and open swales</li> <li>Treatment to upper portion provided by a downstream defender and open swales</li> <li>Foul water treated on site and treated effluent discharged to the lagoon</li> </ul>	Neutral Residual Effect
	Wider Site	Recreational pressure in the form of human disturbance to qualifying species	Permanent, Negative (Significant) Effect at an International scale	<ul style="list-style-type: none"> <li>Fortify and extend the existing bund along the sea wall BOAT</li> <li>Narrow the existing path and access drive along the BOAT and move it 1m further away from tern island and lagoon</li> </ul>	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)
				<ul style="list-style-type: none"> <li>• Reduce access for kayakers and paddle boarders</li> <li>• Reduce opportunities for anti-social driving along the BOAT</li> <li>• Provision of signs raising awareness and educating on the importance and rarity of plants</li> <li>• Continued presence of tern warden</li> <li>• Additional island creation for nesting</li> </ul>	
		Recreational pressure causing degradation to qualifying habitats through activities such as additional footfall, littering and invasive species introduction	Permanent, Negative (Significant) Effect at an International scale	<ul style="list-style-type: none"> <li>• Formalising paths to discourage visitors from trampling sensitive habitats</li> <li>• Provision of signs educating on the importance and rarity of habitats</li> <li>• Provision of dog waste bins and litter bins</li> <li>• On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species</li> </ul>	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Habitats	Welcome Building	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.	<ul style="list-style-type: none"> <li>• Provision of signs educating on the importance and rarity of habitats</li> <li>• Scrub buffer planting around carparks and access drives</li> <li>• Provision of dog waste bins and litter bins</li> <li>• On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species</li> </ul>	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.	<ul style="list-style-type: none"> <li>• Scrub buffer planting around carparks and access drives</li> <li>• Provision of dog waste bins</li> <li>• Conservation grazing to prevent soil nutrient accumulation</li> </ul>	
		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	



Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
	Wider Site	Narrow the existing road into the width of a footpath and therefore increasing the opportunities for sensitive habitats to expand	Permanent, Positive (Significant) Effect at a Regional, National and International scale.	n/a	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.	<ul style="list-style-type: none"> <li>Formalising paths to discourage visitors from trampling sensitive habitats</li> <li>Provision of signs educating on the importance and rarity of habitats</li> <li>Provision of dog waste bins and litter bins</li> <li>On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species</li> </ul>	
		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	

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	Welcome Building	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.	<ul style="list-style-type: none"> <li>Formalising paths to discourage visitors from trampling sensitive habitats</li> <li>Provision of signs educating on the importance and rarity of plants</li> <li>Provision of dog waste bins and litter bins</li> <li>On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species</li> </ul>	Neutral Residual Effect
		The proposals will bring long-term management for a period of at least 30 years	Permanent, Positive (Significant) Effect at a Regional and National scale.	n/a	
	Wider Site	Recreational pressure resulting in habitat degradation on the habitats on site through trampling from footfall, introduction of invasive species, increase in fly	Permanent Negative (Significant) Effect at a Local, National and International scale.	<ul style="list-style-type: none"> <li>Formalising paths to discourage visitors from trampling sensitive habitats</li> </ul>	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)
		tipping and increase in eutrophication through dog faeces		<ul style="list-style-type: none"> <li>Provision of signs raising awareness and educating on the importance and rarity of plants</li> <li>Provision of dog waste bins and litter bins</li> <li>On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species</li> </ul>	
		Long-term management to the site for a period of at least 30 years	Permanent, Positive (Significant) Effect at a Regional and National scale	n/a	
Breeding bird	Welcome Building	None	Negligible (Not Significant)	<ul style="list-style-type: none"> <li>n/a</li> </ul>	Neutral Residual Effect
	Wider Site	Proposals estimate peaks of 150 visitors per hour over the course of a day during peak periods (school holidays, warm weather). The increase in visitors has	Permanent Negative (Significant) Effect at an International scale.	<ul style="list-style-type: none"> <li>Fortify and extend the existing bund along the sea wall BOAT</li> <li>Narrow the existing path and access drive along the BOAT and</li> </ul>	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)
		potential to increase the frequency of human disturbance to breeding terns and gulls.		<p>move it 1m further away from tern island and lagoon</p> <ul style="list-style-type: none"> <li>• Reduce access for kayakers and paddle boarders</li> <li>• Reduce opportunities for anti-social driving along the BOAT</li> <li>• Provision of signs raising awareness and educating on the importance and rarity of plants</li> <li>• Continued presence of tern warden</li> <li>• Additional island creation for nesting</li> </ul>	
Overwintering birds	Welcome Building	None	Negligible (Not Significant)	<ul style="list-style-type: none"> <li>• n/a</li> </ul>	Neutral Residual Effect
	Wider Site	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.	Permanent Negative (Significant) Effect at an International scale.	<ul style="list-style-type: none"> <li>• Fortify and extend the existing bund along the sea wall BOAT</li> <li>• Narrow the existing path and access drive along the BOAT and move it 1m further away from tern island and lagoon</li> </ul>	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)
				<ul style="list-style-type: none"> <li>Reduce access for kayakers and paddle boarders</li> <li>Reduce opportunities for anti-social driving along the BOAT</li> <li>Provision of signs raising awareness and educating on the importance and rarity of plants</li> </ul>	
Natterjack toad	Welcome Building	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
	Wider site	The roads will be re-surfaced and any potholes filled in leaving less opportunities for opportunistic natterjacks seeking refuge in pool formed in potholes which would reduce the chance of them being run-over by vehicles using the site.	Permanent, Positive (Not Significant) Effect at a National scale.	n/a	Permanent Positive Residual Effect at a National level (Significant)
		As part of the drainage strategy, swales suitable for Natterjacks will be created	Permanent, Positive (Significant) Effect at a 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)
Reptiles	Welcome Building	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.	<ul style="list-style-type: none"> <li>Formalisation of paths</li> <li>Signage will be also used to provide information about their ecology, identification tips and give a deeper understanding of the reptiles present</li> <li>Increased refugia across the site in locations where walkers and dogs will be discouraged</li> </ul>	Neutral Residual Effect
	Wider Site	Increased disturbance and harm from people and dogs	Permanent Negative (Not Significant) Effect at a Local scale.	<ul style="list-style-type: none"> <li>Formalisation of paths</li> <li>Signage will be also used to provide information about their ecology, identification tips and give a deeper understanding of the reptiles present</li> <li>Increased refugia across the site</li> </ul>	Neutral Residual Effect
Invertebrates	Welcome Building	The development ensures the long-term management commitment to habitats that would otherwise scrub over and result in a homogenous habitat	Permanent, Positive (Significant) Effect at District scale.	n/a	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)
	Wider Site	The development ensures the long-term management commitment to habitats that would otherwise scrub over and result in a homogenous habitat	Permanent, Positive (Significant) Effect at District scale	n/a	Permanent, Positive effect at District Level (Significant)
Amphibians	Welcome Building	Increased disturbance and harm from people and dogs	Permanent Negative (Not Significant) Effect at a Local scale.	<ul style="list-style-type: none"> <li>Formalisation of paths</li> <li>Signage will be also used to provide information about their ecology, identification tips</li> <li>Increased refugia across the site</li> </ul>	Neutral Residual Effect
Amphibians	Wider Site	Increased disturbance and harm from people and dogs	Permanent Negative (Not Significant) Effect at a Local scale.	<ul style="list-style-type: none"> <li>Formalisation of paths</li> <li>Signage will be also used to provide information about their ecology, identification tips</li> <li>Increased refugia across the site</li> </ul>	Neutral Residual Effect
Bats	Welcome Building	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.	<ul style="list-style-type: none"> <li>A bat sensitive lighting strategy will be in place subject to curfews and motion sensors.</li> </ul>	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)
	Wider Site	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
Badgers	Welcome Building	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
	Wider Site	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
Riparian Mammals	Welcome Building	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
	Wider Site	Reduced use of the site by otters due to increased numbers of visitors and dogs; otters are a secretive species and are deterred by human disturbance.	Permanent, Negative (Not Significant) Effect at a Local scale	<ul style="list-style-type: none"> <li>Enhancement of scrub habitat leaving opportunities for otters to shelter</li> </ul>	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	Welcome Building	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
	Wider Site	None	Negligible (Not Significant)	n/a	Neutral Residual Effect

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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 A) 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.

## 2.0 INTRODUCTION

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 document has been carried out to support a planning submission for the site which seeks *"erection of welcome building with café, retail space, staff facilities and car park, repair and stabilisation works at Hodbarrow Beacon, repair and stabilisation works and installation of 'camera obscura' structure at Towsey Hole Windmill, installation of cladding and new living roof to existing bird hide, erection of new bird hides and viewing platforms, creation of new multi-use pathways with signage, gateway features and street furniture, making good of existing byway (BOAT) along sea wall, enhancement of wildlife habitats, and associated access, landscaping and drainage infrastructure."*

This report incorporates the historical environmental records available and the findings of a suite of phase II ecology surveys completed between 2021 and 2022 which aimed 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.

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 Assessment<sup>1</sup>. 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 survey area extends to approximately 57.69 hectares 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. For the purposes of this report the site has been split into the area proposed for the welcome building (and associated car parking) and the wider site encompassing the Hodbarrow Nature Reserve. The Hodbarrow Nature Reserve extends to 105ha in total however the lagoon falls outside the planning boundary.

The proposed Welcome Building would be sited on a pocket of land of approximately 2.1ha 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 wider site 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 site 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 contribute to the wider designation of Duddon Estuary and Morcambe Bay Special Protection Area (SPA) and Duddon Estuary Ramsar Site.

The RSPB 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 welcome building with café, retail space, staff facilities and car park, repair and stabilisation works at Hodbarrow Beacon, repair and stabilisation works and installation of 'camera obscura' structure at Towsey Hole Windmill, installation of cladding and new living roof to existing bird hide, erection of new bird hides and viewing platforms, creation of new multi-use pathways with signage, gateway features and street furniture, making good of existing byway (BOAT) along sea wall, enhancement of wildlife habitats, and associated access, landscaping and drainage infrastructure."*

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.

Consideration of the proposals has been separated into:

- Development of a Welcome Building (and associated car parking), which will involve:
  - Clearance of existing dense scrub habitat and 156m<sup>2</sup> (of 1891m<sup>2</sup>) Priority Lowland Meadow habitat to facilitate the development;
  - Retention and protection of the remaining lowland meadow and calcareous grassland;
  - Development of a welcome building 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 sloped roof will be a biodiverse roof which will be seeded with a mix collected from the surrounding calcareous grassland habitats;
  - The development of an access road for two car parks with a total of 80 spaces;

- The narrowing of an existing road to form a path from a new carpark to the Proposed Welcome Building and creation of a biodiverse roof on the welcome building. An area of 2649m<sup>2</sup> will be used for new grassland creation including compensation for the loss of priority lowland meadow; and
- The hardstanding will be broken up and removed to other areas of the site. The bare ground will be seeded with a late summer cut of the adjacent calcareous grassland and lowland meadow habitats.
- Improvements across the wider site, which include:
  - Narrowing the existing BOAT to fit one car with occasional passing places;
  - Formalise desire lines to be retained through fencing off and laying with a natural, permeable surface;
  - The closing off of existing desire lines which are not beneficial for sensitive habitats;
  - 17012m<sup>2</sup> of habitat restoration/creation will be available through the formalising and closing of paths;
  - Maintenance and repairs to the old lighthouse and beacon;
  - 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 on the old sea wall.

## 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. 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 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.

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## 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 welcome building and car park has been selected as it is currently comprised of common and widespread dense scrub habitat. An area of car parking has been moved to avoid Annex I habitat, in light of the 2022 National Vegetation Classification 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.

## 3.0 METHODOLOGY

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

### 3.1 PRELIMINARY ECOLOGICAL APPRAISAL

The EclA was informed by the findings of two Preliminary Ecological Appraisals (PEA) produced by Appletons in 2021 and 2022. Site visits were undertaken by Lucy Gibson Consulting and Appletons throughout May and August 2021 which informed the Preliminary Ecological Appraisal (PEA)<sup>2</sup> 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). An PEA was undertaken in January 2022 to understand the ecological baseline of the area of the proposed welcome building and car park site<sup>3</sup>. 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.

#### Desk Top Review

Greengage undertook a review of readily available ecological information supplied by the RSPB and other relevant environmental databases (included Defra's Multi-Agency Geographic Information for the Countryside (MAGIC) website<sup>4</sup>) for the site and its vicinity. In addition, a local biological records search from Cumbria Biodiversity Data Centre (CBDC) were reviewed to identify the location and citations of local non-statutory designated sites and presence of records for notable and protected species. This provided the overall ecological context for the site.

#### Breeding Birds and Overwintering Birds

No breeding bird or overwintering bird surveys were undertaken given the wealth of data that the RSPB reserve has. Therefore, the site records (effectively comprising third-party phase II survey data) have been assessed to inform this EclA. For the breeding bird surveys, the most recent data was used as well as the peak count of breeding pairs within the past 10 years, to assess the sites importance for individual species. Greengage have also reviewed the records from RSPB since 2012 between November to March to assess wintering and passage assemblages.

The following conservation statuses are considered:

- Bird species of Annex I of the Birds Directive which are:
  - In danger of extinction
  - vulnerable to specific changes in their habitat;

- considered rare because of small populations or restricted local distribution;
- requiring particular attention for reasons of the specific nature of habitat.
- Birds of Conservation Concern (BoCC) status:
  - Red list (Globally threatened according to the IUCN criteria<sup>5</sup>);
  - Amber (Medium conservation concern, unfavourable/threatened conservation status in Europe);
  - Green list (Not showing moderate or severe declines);
- Section 41 of the Natural Environment and Rural Communities (2006);
- Schedule 1 of the Wildlife and Countryside Act (WCA) 1981 (as amended).

## Habitat survey

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 as far as possible, using the Phase 1 Habitat Survey methodology (JNCC, 2010), 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 survey areas for each PEA are shown within the individual reports (ref: 2363 Hodbarrow PEA Summary Final Report and 2363 Hodbarrow PEA Summary alternative car park site).

### 3.2 PHASE II SURVEYS

The following phase II field surveys have been undertaken in support of this assessment:

- National Vegetation Classification (NVC);
- Invertebrates;
- Reptiles; and
- Amphibians

Detailed methodology is provided within the Phase II Surveys report with a summary provided below.

#### NVC

The PEA identified the need for a National Vegetation Classification Survey for the area selected for the welcome building and a 20m Zone of Influence around the paths/roads proposed for formalisation on the wider site.

The NVC survey aimed to quantify the condition of habitats and to identify any habitats of importance including:



- Annex I habitats: these are habitats identified under Annex I of the Habitats Directive. All Annex I habitat types must be regarded as being of international-level importance (CIEEM, 2019);
- Habitats of Principal Importance (HPIs): often referred to as ‘priority habitats’, HPIs include habitats of special importance for conservation as identified under Section 41 (S.41) Natural Environment and Rural Communities (NERC) Act 2006; and
- Local Biodiversity Action Plan (LBAP) habitats: LBAP habitats include habitats which are of special conservation importance within Cumbria.

The Survey also aimed to identify any protected and notable plants. As per CIEEM (2019), an ‘important plant’ for the purposes of this report is defined as a species/taxon which is:

- Specially protected: plants protected from picking, uprooting, killing, cutting, possession or sale;
- Priority species: a plant which is recognised as a Species of Principal Importance (SPI) in England under S.41 NERC Act 2006;
- Local priority species: a plant which is recognised as a species of local conservation priority in Cumbria under the LBAP;
- Species of Conservation Importance: a plant which is recognised under the north west Biodiversity Audit as a Species of Conservation Importance for the region of north west England;
- Red-listed species: plants which are red-listed in Great Britain and/or England (Botanical Society Britain & Ireland, 2021, Stroh et al, 20146);
- Nationally rare/scarce: plants which occur at very few locations nationally (<16 for nationally rare taxa, <101 for nationally scarce taxa); and
- Locally rare/scarce: plants which are scarce in the local area/region. These may or may not be included on the Cumbria Rare Plant Register (Porter & Halliday, 20147).

The NVC identified baseline habitats and notable plants present in the survey areas (Figure 3.1) on the following dates:

- Key Areas identified as 20m either side of existing paths on 25th-26th June 2021 (red line survey boundary)<sup>8</sup>
- The welcome building area and 20m either side of existing paths undertaken 20th to 22nd May 2022 (blue line survey boundary)<sup>9</sup>
- A Phase III Notable Plant Survey was also undertaken between 20th-22nd May 2022 (both red and blue line survey boundary).

Figure 3.1 Approximate NVC survey boundaries



Following the guidelines given by Rodwell (2006)<sup>10</sup>, homogenous stands of vegetation, as defined by the National Vegetation Classification (NVC) set out by Rodwell, were identified in the field during walkover surveys and boundaries drawn over an aerial photograph downloaded from Google Earth. Where vegetation was plainly heterogeneous and/or where it did not fit comfortably within the framework of existing NVC classifications a transition/mosaic of communities or a non-referable classification was mapped.

Further detail on methodology, constraints, auxiliary survey data and surveyor competencies, can be found within the Phase II survey report (ref: 551959ltMar23FV01\_Phase2Surveys).

Data obtained from RSPB for the wider site was also reviewed by Greengage.

### Amphibians

Tyrer Ecological Consultants Ltd followed an adopted methodology based on the Natterjack Handbook<sup>11</sup>.

The 2021 presence/likely absence surveys for natterjack toads and GCN comprised a total of four site 'walkovers' that involved four transects between May and June 2021<sup>12</sup>. Other areas were surveyed based on favourable habitat conditions. Dense woodland and scrub was generally scanned but the more open habitats were favoured when torching. Additionally, three semi-permanent ponds at RSPB Hodbarrow were surveyed closely (see Figure 4.2 below).

The 2022 surveys involved walked transects and a pond inspection for natterjack toads on 4 occasions in April and May 2022 following a two-week period of rainfall to enable the lead surveyor to identify key areas<sup>13</sup>. The walkovers included inspection of ponds, pools and waterbodies and local environs that included a meticulous search for 3-4 hours per survey from sunset on each of the surveys.

A total of 7 Key Areas were identified, along with a known breeding pool (see Figure 3.2 Map of approximate key areas, torching areas, and ponds and transects).

Figure 3.2 Map of approximate key areas, torching areas, and ponds and transects



A total of eight site ‘walkovers’ in 2021 and 2022 were carried out that involved repeat transects adopting the following methods:

- Torchlight use: This technique involved a visual search for Natterjack toads in key areas including margins of suitable water bodies. High-powered torches (x2 Clu-lite Deluxe CB2’s) were used after nightfall. Along tracks and habitat edges the beam was shone ahead of the surveyor sweeping side to side on occasion with care not to shine into sensitive areas concerning breeding birds (for example, Tern/wader nesting areas). Pond/pool perimeters were walked carefully and methodically taking care to record animals seen. To maximise the reliability of this technique, all torch surveys were conducted on evenings where the air temperature exceeded 5°C, when amphibians are generally considered being most active.
- Refuge/Terrestrial search: Natterjacks and Great Crested Newts rest under refuge areas such as rocks, debris, itemised rubble etc. Where it was safe to do so, smaller items were turned over / loosely dismantled to inspect these areas for evidence of the target species.

- Egg strings, tadpoles and toadlets search: Suitable ephemeral pools and ponds were inspected for egg strings or tadpoles of Natterjack toads, as well as eggs/efts of GCN where access permits. Where tadpoles were found the surveyor attempted to identify the target to species level, though this is not always a reliable ID method as it is difficult to visually differentiate Natterjack and Common Toad tadpoles.
- Listening for Natterjack calls: Reasonable silence was applied throughout the surveys to enable surveyors to listen for calling toads.

### Reptiles

The reptile surveys were carried out by Lucy Gibson consulting and Appletons<sup>14</sup>. A population size class survey for reptiles was undertaken in accordance with the best practice methodology<sup>15</sup>. A series of 270 c.50cm x 50cm artificial refugia made of both roofing felt and corrugated tin were placed in suitable habitats on the proposed welcome building and car park site, and within a c.30m buffer along the BOAT/main paths on the wider site. 11 survey visits were undertaken across March, April, May and June 2022 with the survey sufficient to detect all species of reptiles including those most likely to be present, particularly slow worm (*Anguis fragilis*), common lizard (*Zootoca vivipara*) and grass snake (*Natrix natrix*).

Further detail on methodology, constraints, auxiliary survey data and surveyor competencies, can be found within the Phase II survey report (ref: 551959ltMay23FV01\_Phase2Surveys).

### Invertebrates

Surveys for invertebrates were undertaken by Stenecology within 20m buffers along the main paths across the wider site on 24th May, 11th June and 11th July 2021<sup>16</sup> and the welcome building area were undertaken in 19th April, 11th May and 29th May 2022<sup>17</sup> with six visits in total during suitable weather conditions. The methods used or the assessment are those recommended in the Natural England guidance document<sup>18</sup>. Standard field techniques were employed to sample the invertebrate fauna across the area proposed for the welcome building and carpark. These included handsearching, sieving, sweep netting, beating and pitfall traps.

The online Patheon database<sup>19</sup> tool was used to analyse invertebrate sample data. If an assemblage or suite of assemblages are found to be in favourable condition this would indicate that the site is likely to be of significant importance for invertebrates.

Further detail on methodology, constraints, auxiliary survey data and surveyor competencies, can be found within the Phase II survey report (ref: 551959ltJun23FV02\_Phase2Surveys).

## 3.3 ECOLOGICAL IMPACT ASSESSMENT

This EclA was undertaken in line with guidance in the Chartered Institute of Ecological and Environmental Management (CIEEM) (2019) Guidelines for Ecological Impact Assessment and in accordance with BS42020:2013: Biodiversity.

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## 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

Severity	Periodicity	Extent
	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 welcome building 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 5.2 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 EclA:

- Designated sites:
  - The Hodbarrow Nature Reserve falls within the designated site boundaries of Morecambe Bay and Duddon Estuary SPA, SAC, Ramsar and SSSI and the welcome building development and car park footprint falls immediately outside this boundary to the north-east;
- Habitats:
  - Both the welcome building area and the wider site have semi-natural dry grasslands and scrubland facies on calcareous substrates (H6210);
  - The wider site 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 welcome building/car park site, including cotoneaster spp, variegated yellow archangel, Montbretia, Japanese knotweed and sea buckthorn.
- 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 wider site and the adjacent welcome building 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 (*Zootoca vivipara*) have been recorded in both the area proposed for the welcome building and in habitats surveyed on the wider site.
  - One slow-worm (*Anguis fragilis*) was recorded within the wider site
- Invertebrates:
  - The welcome building site supports at least 86 terrestrial invertebrate species, three of which are notable; and
  - The welcome building and associated car parking area has district (low) importance for invertebrates.
  - The habitats along the paths across some of the wider site 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

The following ecological receptors are also included within the EclA:



- Smooth newt (*Lissotriton vulgaris*), common toad (*Bufo bufo*) and common frog (*Rana temporaria*);
- Riparian mammals;
- Bats; and
- Badgers.

### 3.4 SURVEYORS

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.

Laura Thomas, 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.

This report was written by Laura Thomas and reviewed and verified by Stephanie Harper and Faye Durkin 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.

## 4.0 BASELINE ECOLOGICAL CONDITIONS AND ASSESSMENT OF CONSERVATION VALUE

### 4.1 DESIGNATIONS

The Hodbarrow Nature Reserve lies within the Morecombe Bay and Duddon Estuary Special Protection Area (SPA), Special Area of Conservation (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 welcome building and car park area lies just outside the boundary of these designations.

Morecombe 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. Morecombe 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 (*Bufo calamita*) and a rich assemblage of wetland plants and invertebrates.

The SPA, SAC and Ramsar sites are part of a system known collectively as Natura 2000 sites. They are designated under Article 6 of the Habitats Directive (92/43/EEC)<sup>20</sup> together with Article 4.1 and 4.2 Wild Birds Directive (2009/147/EC)<sup>21</sup> which aims to protect and improve Europe's most important habitats and species. The terrestrial elements of the Directives are transposed into English law by the Habitats and Species Regulations 2019. Legislation and Policy of relevance to receptors and sites described in this report are outlined in Appendix A. 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).

### Morecombe Bay and Duddon Estuary Special Protection Area<sup>22</sup>

#### 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 4.1 *Qualifying species at Morecombe Bay and Duddon Estuary*

Species	Season	% of population
Whooper swan ( <i>Cygnus Cygnus</i> )	Non-breeding	1.0% of GB population
Little egret ( <i>Egretta garzetta</i> )	Non-breeding	3.0% of GB population

Species	Season	% of population
European golden plover (Pluvialis apricaria)	Non-breeding	1.0% of GB population (1991)
Bar-tailed Godwit (Limosa lapponica)	Non-breeding	8.0% of GB population
Ruff (Calidris pugnax)	Non-breeding	1.0% of GB population
Mediterranean gull (Larus melancephalus)	Non-breeding	1.0% of GB population
Little tern (Sternula albifrons)	Breeding	2.2% of GB population
Sandwich tern (Sterna sandvicensis)	Breeding	5.7% of GB population (1992)
Common tern (Sterna hirundo)	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 4.2 Annex 2 Migratory species at Morecambe Bay and Duddon Estuary

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

### Morecombe Bay Special Area of Conservation (SAC)<sup>23</sup>

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 (*Triturus cristatus*)
- 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 Ramsar<sup>24</sup>

Qualification for Ramsar criteria:

- Supports nationally important numbers of the rare natterjack toad (*Bufo calamita*), 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 (*Tringa totanus*)

### Duddon Estuary Site of Special Scientific Interest<sup>25</sup>

The citation includes information expanding on what has been described in relation to Nature 2000 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 5 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 Plan<sup>26</sup> 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 (*Armadillidum vulgare*).

## Assessment of Conservation Value

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

## 4.2 HABITATS

### Proposed Welcome Building

The following NVC communities were recorded on the welcome building and associated car parking site and are described below. Further detail on each of NVC classifications is presented in the Phase II survey report (551959ltMay23FV02\_Phase2Surveys).

Table 4.3 gives the NVC communities and their distribution and importance.

Table 4.3 Proposed Welcome Building 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**.

### Wider Site and 20m buffers

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 4.4 gives the NVC communities and their national and regional distribution.



Table 4.4 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 National Vegetation Classification 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 wider site 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**.

## 4.3 NOTABLE PLANTS

### Proposed Welcome Building

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 4.5

Table 4.5 Notable plants within the area proposed for the Proposed Welcome Building and carpark

Species	Conservation Status	Importance
Common cudweed ( <i>Filago germanica</i> )	<ul style="list-style-type: none"> <li>Near-Threatened in England</li> <li>Rare across the region of north-west England</li> <li>Cumbria RPR</li> </ul>	Regional importance
Fern-grass ( <i>Catapodium rigidum</i> )	<ul style="list-style-type: none"> <li>North-west England</li> <li>Local in Cumbria</li> </ul>	
Wild marjoram ( <i>Origanum vulgare</i> )	<ul style="list-style-type: none"> <li>Least Concern in England</li> <li>Local as a native plant in Cumbria</li> </ul>	County importance
Carline thistle ( <i>Carlina vulgaris</i> )	<ul style="list-style-type: none"> <li>Near-threatened in England</li> <li>Local in Cumbria</li> </ul>	Local importance
Eyebright ( <i>Euphrasia</i> sp.) Likely to be <i>E. nemorosa</i> or <i>E. confusa</i>	<ul style="list-style-type: none"> <li>Near-Threatened or Vulnerable in England</li> <li>Widespread in Cumbria</li> </ul>	
Quaking-grass ( <i>Briza media</i> )	<ul style="list-style-type: none"> <li>Near-threatened in England</li> <li>Widespread locally</li> </ul>	
Wild strawberry ( <i>Fragaria vesca</i> )	<ul style="list-style-type: none"> <li>Near-threatened in England and widespread</li> </ul>	

### Assessment of Conservation Value

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

### Wider Site and 20m buffer

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 4.6

Table 4.6 Plant communities within 20m buffer of proposed paths

Species	Conservation Status	Importance
Irish dandelion ( <i>Taraxacum aesculosum</i> )*	<ul style="list-style-type: none"> <li>Nationally rare in Britain</li> <li>Critically Endangered for England</li> </ul>	High (international level importance)
Pillwort ( <i>Pilularia globulifera</i> )	<ul style="list-style-type: none"> <li>Nationally scarce in Britain</li> <li>Vulnerable in England</li> <li>S.41 species</li> <li>Listed on Cumbria Rare Plant Register (RPR)</li> </ul>	High (national importance)
Moonwort ( <i>Botrychium lunaria</i> s.s.)	<ul style="list-style-type: none"> <li>Vulnerable in England;</li> <li>Scarce in Cumbria and North West England</li> <li>S.41 Species</li> </ul>	High (regional importance)
Small-fruited yellow sedge ( <i>Carex oederi</i> )	<ul style="list-style-type: none"> <li>Nationally scarce in Britain</li> <li>Least Concern in England</li> <li>Rare in the region of north-west England</li> </ul> Scarce on the Cumbria RPR	
Thread-leaved water-crowfoot ( <i>Ranunculus trichophyllos</i> )	<ul style="list-style-type: none"> <li>Least Concern in England</li> <li>Rare within the region of north-west England</li> </ul>	
Fennel pondweed ( <i>Potamogeton pectinatus</i> )	<ul style="list-style-type: none"> <li>Least Concern in England</li> <li>Rare species in Cumbria</li> </ul>	County importance
Spiked water milfoil ( <i>Myriophyllum spicatum</i> )	<ul style="list-style-type: none"> <li>Least Concern in England</li> </ul>	
Eyebright sp. ( <i>Euphrasia nemorosa/confusa</i> )	<ul style="list-style-type: none"> <li>Near-Threatened or Vulnerable in England</li> <li>Widespread in Cumbria</li> </ul>	

Species	Conservation Status	Importance
Few-flowered spike-rush ( <i>Eleocharis quinqueflora</i> )	<ul style="list-style-type: none"> <li>Least Concern in England</li> <li>SCI plant for north-west England</li> </ul>	Local importance
Flea Sedge ( <i>Carex pulicaris</i> )	<ul style="list-style-type: none"> <li>Near-threatened in England</li> <li>Widespread and local in Cumbria</li> </ul>	
Heath speedwell ( <i>Veronica officinalis</i> )	<ul style="list-style-type: none"> <li>Near-threatened in England</li> <li>Widespread in Cumbria</li> </ul>	
Lesser spearwort ( <i>Ranunculus flammula</i> )	<ul style="list-style-type: none"> <li>Least Concern in England</li> <li>Widespread but local Cumbria,</li> <li>SCI plant for north-west England</li> </ul>	
Marsh pennywort ( <i>Hydrocotyle vulgaris</i> )	<ul style="list-style-type: none"> <li>Near-threatened in England</li> <li>Widespread in Cumbria</li> </ul>	
Northern marsh orchid ( <i>Dactylorhiza purpurella</i> )	<ul style="list-style-type: none"> <li>Widespread in Cumbria and Northern Britain</li> <li>SCI within north-west England</li> </ul>	
Tormentil ( <i>Potentilla erecta</i> )	<ul style="list-style-type: none"> <li>Near-threatened in England and widespread.</li> </ul>	
Eyebright sp. ( <i>Euphrasia nemorosa/confusa</i> )	<ul style="list-style-type: none"> <li>Near-Threatened or Vulnerable in England</li> <li>Widespread in Cumbria</li> </ul>	
Wild strawberry ( <i>Fragaria vesca</i> )	<ul style="list-style-type: none"> <li>Near Threatened in England and widespread</li> </ul>	

\*Outside the survey area but still considered as part of the assessment.

### Assessment of Conservation Value

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

#### *Wider site*

RSPB records of the wider site 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 4.7 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
Desmazeria marina	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
<b>Fungi</b>	
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

#### 4.4 BREEDING BIRDS

An assessment of the importance of the habitats of the area proposed for the welcome building and by the wider site for breeding birds has been made below.

##### Proposed Welcome Building

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 during the PEA 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 Centre<sup>27</sup>.

Table 4.8 Birds likely to nest within the dense scrub associated with the area selected for the Proposed Welcome Building

Species	Status	Geographic Value
Greenfinch ( <i>Chloris chloris</i> )	(BoCC) Red list Species of Local Conservation Interest	Local
Linnet ( <i>Linaria cannabina</i> )	Red	Local
Dunnock ( <i>Prunella modularis</i> )	Amber S.41 Species	Local
Song thrush ( <i>Turdus philomelos</i> )	Amber S.41 Species	Local
Bullfinch ( <i>Pyrrhula pyrrhula</i> )	Amber S.41 Species	Local
Wren ( <i>Troglodytes troglodytes</i> )	Amber	Local
White throat ( <i>Sylvia communis</i> )	Amber	Local
Willow warbler ( <i>Phylloscopus trochilus</i> )	Amber	Local
<b>Other species</b>		
Magpie ( <i>Pica pica</i> ), chaffinch ( <i>Fringilla coelebs</i> ), blackbird ( <i>Turdus merula</i> ), goldfinch ( <i>Carduelis carduelis</i> ), robin ( <i>Erithacus rubecula</i> ), woodpigeon ( <i>Columba palumbus</i> ), crow ( <i>Corvus corone</i> ), great tit ( <i>Parus major</i> ), blue tit ( <i>Cyanistes caeruleus</i> ), chiffchaff ( <i>Phylloscopus collybita</i> ), blackcap ( <i>Sylvia atricapilla</i> ), long-tailed tit ( <i>Aegithalos caudatus</i> )		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 the PEA 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.

### Wider Site

RSPB have provided the breeding bird data for the entire historical breeding bird data up to 2022. The number of breeding pairs in 2022 has been provided in the table below. Where no birds were observed in 2022, their peak count since 2000 was given.

Table 4.9 Latest lagoon breeding bird figures provided by RSPB

Species	Status	Estimated number of Breeding Pairs
Lagoon		
2022		
Lapwing ( <i>Vanellus vanellus</i> )	Red list S.41 species	10
Herring gull ( <i>Larus argentatus</i> )	Red list S.41 species Reason for SPA designation	7
Grasshopper Warbler ( <i>Locustella naevia</i> )	Red list	1
Ringed plover ( <i>Charadrius hiaticula</i> )	Red list	5
Common tern ( <i>Sterna hirundo</i> )	Amber Reason for SPA designation	54
Sandwich tern ( <i>Thalasseus sandvicensis</i> )	Amber Reason for SPA designation	589
Little tern ( <i>Sternula albifrons</i> )	Amber Reason for SPA designation Schedule 1	44
Lesser black-backed gull ( <i>Larus fuscus</i> )	Amber Reason for SPA designation	27
Spoonbill ( <i>Platalea leucorodia</i> )	Amber Schedule 1	1
Arctic tern ( <i>Sterna paradisaea</i> )	Amber	4
Black-headed gull ( <i>Chroicocephalus ridibundus</i> )	Amber	522
Great black backed gull ( <i>Larus marinus</i> )	Amber	4
Eider ( <i>Somateria mollissima</i> )	Amber	57 island, 9 ski bank
Red-breasted Merganser ( <i>Mergus serrator</i> )	Amber	3
Common gull ( <i>Larus canus</i> )	Amber	1



Species	Status	Estimated number of Breeding Pairs
Oystercatcher ( <i>Haematopus ostralegus</i> )	Amber	13
Greylag Goose ( <i>Anser anser</i> )	Amber	1
Mallard ( <i>Anas platyrhynchos</i> )	Amber	1 island, 1 ski bank
Moorhen ( <i>Gallinula chloropus</i> )	Amber	4
Grey Heron ( <i>Ardea cinerea</i> )	Green	3
Little egret ( <i>Egretta garzetta</i> )	Green	10
Great crested grebe ( <i>Podiceps cristatus</i> )	Green	1
Cormorant ( <i>Phalacrocorax carbo</i> )	Green	4
Tufted duck ( <i>Aythya fuligula</i> )	Green	4
Canada goose ( <i>Branta canadensis</i> )	Introduced	4 lagoon 2 ski bank
<b>Pre-2022</b>		
Redshank ( <i>Tringa totanus</i> )	Amber	2 (2012)
Teal ( <i>Anas crecca</i> )	Amber	1 (2014)
Gadwall ( <i>Mareca strepera</i> )	Amber	1 (2012)
Mediterranean gull ( <i>Ichthyaeetus melanocephalus</i> )	Amber Schedule 1	0 (2 in 2008)
Tufted Duck ( <i>Aythya fuligula</i> )	Green	10 (2015)
<b>Habitats around the reserve</b>		
<b>2022</b>		
Grasshopper Warbler ( <i>Locustella naevia</i> )	Red	1
Linnet ( <i>Carduelis cannabina</i> )	Red	7
Greenfinch ( <i>Chloris chloris</i> )	Red	2
Meadow Pipit ( <i>Anthus pratensis</i> )	Amber	1
Wood Pigeon ( <i>Columba palumbus</i> )	Amber	5
Dunnock ( <i>Prunella modularis</i> )	Amber	2
Whitethroat ( <i>Sylvia communis</i> )	Amber	7
Sedge Warbler ( <i>Acrocephalus schoenobaenus</i> )	Amber	5
Willow Warbler ( <i>Phylloscopus trochilus</i> )	Amber	34
Wren ( <i>Troglodytes troglodytes</i> )	Amber	8
Bullfinch ( <i>Pyrrhula pyrrhula</i> )	Amber	1

Species	Status	Estimated number of Breeding Pairs
Reed Bunting ( <i>Emberiza schoeniclus</i> )	Amber	1
Rock Pipit ( <i>Anthus petrosus</i> )	Green	1
Pied Wagtail ( <i>Motacilla alba</i> )	Green	2
Robin ( <i>Erithacus rubecula</i> )	Green	2
Blackbird ( <i>Turdus merula</i> )	Green	5
Blackcap ( <i>Sylvia atricapilla</i> )	Green	10
Lesser Whitethroat ( <i>Sylvia curruca</i> )	Green	2
Chiffchaff ( <i>Phylloscopus collybita</i> )	Green	15
Great Tit ( <i>Parus major</i> )	Green	2
Blue Tit ( <i>Cyanistes caeruleus</i> )	Green	10
Long-tailed Tit ( <i>Aegithalos caudatus</i> )	Green	1
Magpie ( <i>Pica pica</i> )	Green	1
Jay ( <i>Garrulus glandarius</i> )	Green	1
Chaffinch ( <i>Fringilla coelebs</i> )	Green	11
Goldfinch ( <i>Carduelis carduelis</i> )	Green	6

### Assessment of Conservation Value

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

The site 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 site 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**.

## 4.5 OVERWINTERING BIRDS

### Proposed Welcome Building

The terrestrial habitats associated with the welcome building site do not have value for notable overwintering bird species which typically require large expanses of water.

## Assessment of Conservation Value

Overall, the welcome building site has **Negligible importance** for overwintering birds.

## Wider Site

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

Table 4.10 Wintering bird assemblages at Hodbarrow (2012-2022)

Species	Conservation Status	Peak Count in Winter 2021/2022 (Peak Count in 10 years)
Black-tailed Godwit ( <i>Limosa limosa</i> )	Red LBAP Qualifying species for SPA designation	52
Curlew ( <i>Numenius arquata</i> )	Red LBAP Qualifying species for SPA designation	38 (300 in 2019)
Dunlin ( <i>Calidris alpina alpina</i> )	Red Qualifying species for SPA designation	151 (600 in 2020)
Ringed plover	Red list Qualifying species for SPA designation	15 (100 in 2016)
Goldeneye ( <i>Bucephala clangula</i> )	Red	48 (85 in Mar 2021)
Pochard ( <i>Aythya ferina</i> )	Red	2 (48 in 2012)
Scaup ( <i>Aythya marila</i> )	Red LBAP	0 (17 in 2017)
Slavonian Grebe ( <i>Podiceps auritus</i> )	Red	1 (peak count)
Bar-tailed Godwit ( <i>Limosa lapponica</i> )	Amber Qualifying species for SPA designation	0 (1 in March 2021)

Species	Conservation Status	Peak Count in Winter 2021/2022 (Peak Count in 10 years)
Oystercatcher	Amber Qualifying species for SPA designation	42 (522 in 2014)
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	230 (peak count)
Mediterranean Gull ( <i>Larus melancephalus</i> )	Amber Qualifying species for SPA designation	2 (peak count)
Redshank ( <i>Tringa totanus</i> )	Amber Qualifying species for SPA designation	270 (2500 in 2020)
Sanderling ( <i>Calidris alba</i> )	Amber Qualifying species for SPA designation	23 (peak count)
Turnstone ( <i>Arenaria interpres</i> )	Amber Qualifying species for SPA designation	19 (65 in 2012)
Whooper Swan ( <i>Cygnus cygnus</i> )	Amber Qualifying species for SPA designation	5 (80 in 2013)
Black-throated Diver ( <i>Gavia arctica</i> )	Amber LBAP	1 (peak count)
Black-headed Gull	Amber	622 (peak count)
Arctic tern	Amber	2 (peak count)

Species	Conservation Status	Peak Count in Winter 2021/2022 (Peak Count in 10 years)
Common Guillemot ( <i>Uria aalge</i> )	Amber	0 (1 in 2019)
Common gull	Amber	1 (25 in 2012)
Eider	Amber	266 (648 in Mar 2021)
Gadwall	Amber	9 (13 in 2014)
Great Northern Diver ( <i>Gavia immer</i> )	Amber	1 (peak count)
Greenshank	Amber	1 (3 in 2020)
Little Tern	Amber	47 (peak count)
Pink-footed Goose ( <i>Anser brachyrhynchus</i> )	Amber	0 (300 in 2012)
Pintail ( <i>Anas acuta</i> )	Amber	13 (peak count)
Red-breasted Merganser ( <i>Mergus serrator</i> )	Amber	50 (79 in 2013)
Sandwich Tern	Amber	589 (1950 in 2018)
Shoveler ( <i>Anas clypeata</i> )	Amber	3 (4 in 2019)
Spoonbill	Amber	1 (peak count)
Wigeon ( <i>Anas penelope</i> )	Amber	202 (300 in 2020)
Little Egret	Green Qualifying species for SPA designation	10 (71 in 2018)
Golden Plover ( <i>Pluvialis apricaria</i> )	Green	620 (647 in 2017)
Goosander ( <i>Mergus merganser</i> )	Green	0 (1 in 2017)
Great Crested Grebe	Green	11 (peak count)
Rock Pipit ( <i>Anthus petrosus</i> )	Green	1 (peak count)
Garden Warbler ( <i>Sylvia borin</i> )	Green	0 (4 in 2015)
Reed Warbler ( <i>Acrocephalus scirpaceus</i> )	Green	0 (2 in 2015)

Species	Conservation Status	Peak Count in Winter 2021/2022 (Peak Count in 10 years)
Canada Goose	Introduced	52 (60 in 2019)

### 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 wider site 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.

## 4.6 INVERTEBRATES

### Proposed Welcome Building

A total of 86 terrestrial invertebrate species were recorded across the welcome building and car park area 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 district <sup>28</sup>.

### Wider site

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
- *Cerneuella 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.

## 4.7 AMPHIBIANS

### Proposed Welcome Building

A series of ditches and inundation water within shallow pits of dense vegetation falls within the development boundary. These were surveyed during the 2022 surveys and determined unsuitable for natterjack toads as the ditches are heavily shaded, shallow, and the area is isolated given its encapsulation from the wider ephemeral pool network by the surrounding vertical rock faces, large quarry lake and dense scrub. Most of the area was dry by survey visit 2, and completely dry by surveys 3-4. There were no spawn strings found and no animals seen or heard in this area. It should be noted, however, that anecdotal evidence provided by the general public to PEA 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.

Overall, the welcome building area has **Negligible** value for natterjack toads.

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

Common toads, common frogs and smooth newts were identified during every survey visit and therefore the value of the site for these receptors is **Local level**.

### Wider Site

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, these ponds have rapidly become less suitable due to scrub encroachment and no ongoing management.

The 2021 and 2022 surveys confirmed likely absence of natterjack toads on site. Surveys confirmed presence within a known natterjack breeding pond approximately 0.6km north-east of the site with no significant barrier onto site. 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.

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

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

Common toads, common frogs and smooth newts were identified during every survey visit and they are likely to be common and widespread within the area. Therefore for the value of the site for these receptors are considered to be at **Local level**.

## 4.8 REPTILES

### Proposed Welcome Building

Common lizards were observed during every visit of the reptile survey with a peak count of 19 adults/sub-adults were recorded on the carpark 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 System<sup>29</sup> 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 welcome building area for reptiles is at the **Local level**.

### Wider site

Common lizards were observed during every visit of the reptile survey with a peak count of 25 adults/sub-adults were recorded on the wider site 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 wider site 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 wider site for reptiles is at the **Local level**.



## 4.9 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 Welcome Building

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**.

### Wider Site

The wider site 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 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.

## 4.10 BADGER

### Proposed Welcome Building

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.

## Wider Site

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.

## 4.11 RIPARIAN MAMMALS

### Proposed Welcome Building

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.

## Wider Site

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.

## 4.12 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).

## Wider Site

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 (*Fallopia japonica*), *Cotoneaster* sp. Including wall *Cotoneaster*, small-leaved cotoneaster (*Cotoneaster microphyllus*) and variegated yellow archangel (*Lamiastrum galeobdolon* subsp). 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 (*Hippophae rhamnoides*) 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.

## 4.13 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 4.11 Receptors scoped into EcIA

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

Receptors Scoped in to EcIA	Location	Importance
Overwintering birds	Wider Site	International
Invertebrates	Proposed Welcome Building	District
	Wider site	National
Natterjack toads	Wider site	National
Reptiles	Proposed Welcome Building	Local
	Wider site	Local
Bats	Proposed Welcome Building	Local
	Wider site	Local
Badger	Proposed Welcome Building	Local
	Wider site	Local
Riparian mammals	Proposed Welcome Building	Local
	Wider site	Local
Smooth newt, common frog, common toad	Proposed Welcome Building	Local
	Wider site	Local

## 5.0 ASSESSMENT OF CONSTRUCTION IMPACTS

### 5.1 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 5.1 Impacts associated with the proposals

Description of activity	Impact
<b>The Welcome Building (and associated car parking)</b>	
Loss of 3349.47m <sup>2</sup> of dense scrub habitat	Direct
Loss of 156m <sup>2</sup> of Priority Lowland Meadow habitat	Direct
The narrowing of an existing road to form a path from a new carpark to the Proposed Welcome Building and creation of a biodiverse roof on the welcome building. An area of 2649m <sup>2</sup> will be used for new grassland creation	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
<b>Wider Site</b> Proposals seek to narrow existing BOAT/path networks and formalise desire lines and close off some 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	
17,012m <sup>2</sup> of habitat restoration/creation will be available through the narrowing existing paths formalising and closing of paths	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 formalisation of the paths along an existing Byway Open to All Traffic (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 typical construction plant and noise levels for road building using the machinery listed above are likely to range between 109.4dBA-111.5dBA <sup>30</sup> . As mentioned, the equipment is likely to be smaller and lighter than those used for larger scale road projects and so the actual dBA is anticipated to be lower	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.

## 5.2 DESIGNATED SITES

### Proposed Welcome Building

The area proposed for the welcome building 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 welcome building 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 welcome building 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 welcome building and car park are predicted to result in **Negligible (Not Significant) Effects** on the qualifying features.

### Wider site

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 1 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**.

## 5.3 HABITATS

### Proposed Welcome Building

The site selection of the welcome building 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, 156m<sup>2</sup> of 1891m<sup>2</sup> of regionally important Priority Lowland Meadow habitat will be lost to facilitate an access road to the new carpark 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**.

## Wider Site

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**.

## 5.4 NOTABLE PLANTS

### Proposed Welcome Building

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, 156m<sup>2</sup> of regionally important Priority Lowland Meadow home to notable plant species is required to facilitate the access road towards the new carpark. 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 156m<sup>2</sup> 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 welcome building site.

### Wider Site

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**.

The proposals seek to narrow the existing BOAT/paths and therefore expanding natural space and the opportunities for these plants to grow. This will result in a **Permanent, Positive (Significant) Effect varying from a Local, National and International scale**.

## 5.5 BREEDING BIRDS

### Proposed Welcome Building

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 welcome building and carpark 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 carpark. 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.

### Wider site

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 Byway Open to All Traffic (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 season<sup>31</sup> 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 species<sup>32</sup>. 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 typical construction plant and noise levels for similar works are likely to range between 109.4dBA- 111.5dBA 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.

## 5.6 OVERWINTERING BIRDS

### Proposed Welcome Building

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 welcome building and carpark 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 welcome building and carpark footprint. The recommended buffer zones for human disturbance for each species of overwintering birds is located in Table 5.2 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.

## Wider Site

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 present<sup>33</sup>. 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 site<sup>34</sup>.

Table 5.2 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	High	200-650m

Species	Conservation Status	Overall sensitivity to disturbance	Recommended buffer zones in Non-breeding season
	Qualifying species for SPA designation		
Dunlin ( <i>Calidris alpina alpina</i> )	Red Qualifying species for SPA designation	Medium	150-300m
Ringed plover	Red list Qualifying species for SPA designation	High	100-300m
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 <sup>35</sup>	100m*
Redshank ( <i>Tringa totanus</i> )	Amber Qualifying species for SPA designation	Medium	200-300m
Sanderling ( <i>Calidris alba</i> )	Amber		69m <sup>36</sup>

Species	Conservation Status	Overall sensitivity to disturbance	Recommended buffer zones in Non-breeding season
	Qualifying species for SPA designation		
Turnstone ( <i>Arenaria interpres</i> )	Amber Qualifying species for SPA designation		72m <sup>37</sup>
Whooper Swan ( <i>Cygnus cygnus</i> )	Amber Qualifying species for SPA designation	Medium	200-600m
Black-throated Diver ( <i>Gavia arctica</i> )	Amber LBAP	High	<1000m
Little Egret	Green Qualifying species for SPA designation		107m <sup>38</sup>

\*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 habitat<sup>39</sup>. 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.**

## 5.7 NATTERJACK TOADS

### Proposed Welcome Building

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 welcome building and associated carparks, 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, before the pools had dried up towards the end of the survey period.

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.**

### Wider Site

Whilst the surveys confirmed likely absence of natterjack toads on site. Three adult natterjack toad were encountered within 55m of 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.**

## 5.8 REPTILES

### Proposed Welcome Building

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.**

### Wider Site

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 will give 17,012m<sup>2</sup> of hardstanding/heavily trampled habitat will be given back to nature providing more opportunities for reptiles resulting in a **Positive, Permanent, (Significant) Effect at Zone of Influence only.**

## 5.9 INVERTEBRATES

### Proposed Welcome Building

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 2649m<sup>2</sup> of hardstanding will be given back to nature providing more opportunities for invertebrates resulting in a **Permanent, (Significant) Effect at District level.**

### Wider Site

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 will give 17,012m<sup>2</sup> of hardstanding/heavily trampled habitat 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.**

## 5.10 BATS

### Proposed Welcome Building

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.**

### Wider Site

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.**

## 5.11 BADGERS

### Proposed Welcome Building

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.**

### Wider Site

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 will give 17,012m<sup>2</sup> of hardstanding/heavily trampled habitat 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.**

## 5.12 RIPARIAN MAMMALS

### Proposed Welcome Building

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**.

### Wider Site

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**.

## 5.13 HEDGEHOG

### Proposed Welcome Building

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**.

### Wider Site

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**.

## 6.0 ASSESSMENT OF OPERATIONAL IMPACTS

### 6.1 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 6.1 Description of operational impacts

Description of activity	Impact
Proposed Welcome Building (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 carpark 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 Wider site where operational impacts associated with the development include	
Increase in visitors from 40,000 annually to 150,000 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
Increased risk of visual disturbance of breeding and overwintering birds within the Zol (up to 1km) along the BOAT	Direct
Proposals seek to reduce the number of vehicles traversing the site	Direct
Proposals will bring long-term management to the site for a period of at least 30 years	Direct

### 6.2 DESIGNATED SITES

#### Proposed Welcome Building

The provision of a welcome building 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 welcome building and car parking will increase levels of surface run-off and foul water will require removal from site. The proposed strategy for surface water from the welcome building will use gravity towards Hodbarrow lagoon which will be attenuated through a combination of permeable paving and open swales, that will be created to benefit natterjack toads populations. The open swales will act as a form of treatment in addition to a downstream defender which will capture and retain sediments and oil. The surface water flows that cannot be drained into the lagoon will drain under gravity to the quarry which will be treated and attenuated through permeable paving and filter drains. The foul water flows will be treated on site within a pumping station and once treated will be discharged into the lagoon. It is understood that through diving the run off between the two catchments combined with the multiple treatment stages, the runoff will be controlled, reduced and treated appropriately and are not predicted to effect the hydrology of the lagoon and the opportunities for foraging and the qualifying species that use. The drainage report (ref: 081617-CUR-01-ZZ-RP-C-92002 P01 ) 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 welcome building site.

## Wider site

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**.

## 6.3 HABITATS

### Proposed Welcome Building

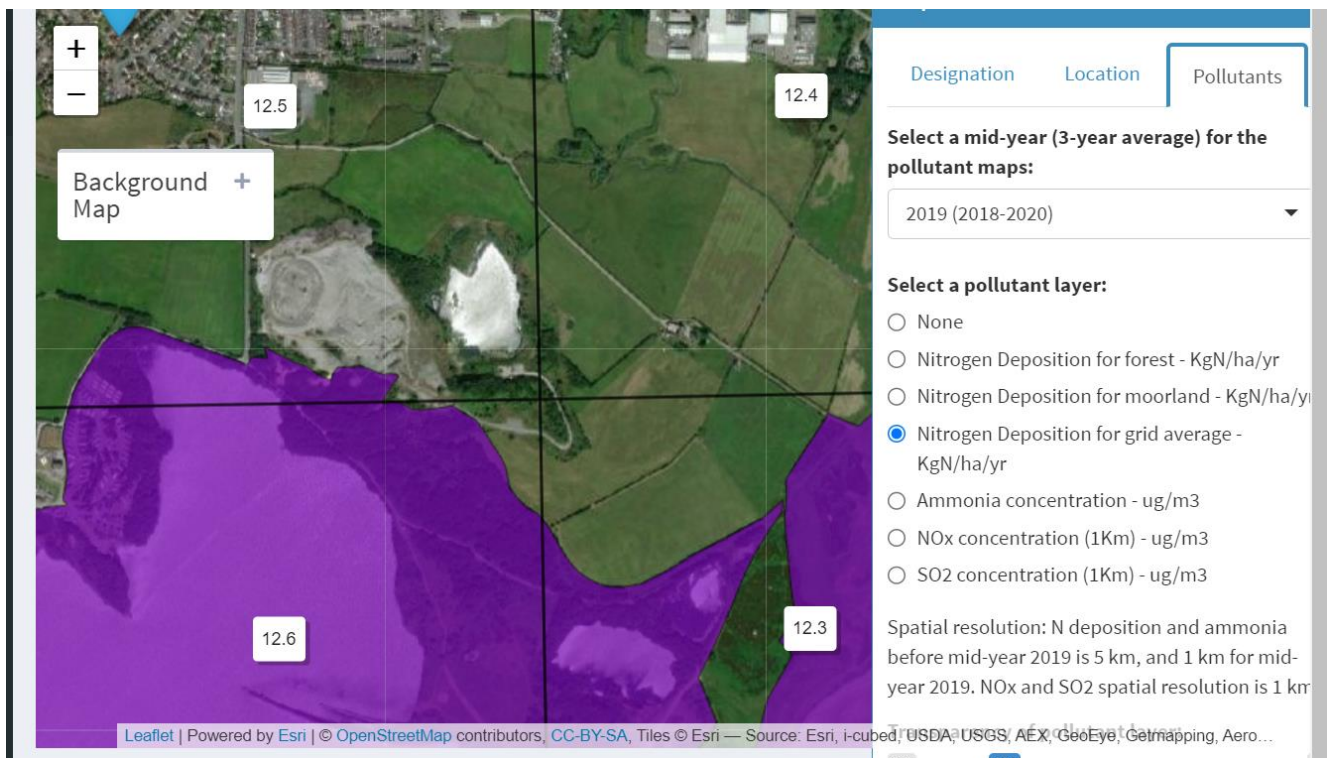
The increase in recreational pressure could result in habitat degradation on the habitats on site through trampling from footfall, introduction of invasive species, increase in fly tipping resulting in a **Permanent, Negative (Significant) Effect at a National to International scale**.

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 welcome building.

Exceedance of critical values airborne of nitrogen oxides (NO<sub>x</sub>) 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)<sup>40</sup> interactive map identifies the welcome building area has a 3-year average of between 12.3-12.5 Nitrogen Deposition KgN/ha/yr (see Figure 6.1). The site falls partially within a quadrat that includes Millom town centre, it is unlikely that the car park will exceed the levels of car activity within the town. Calcareous grassland's critical load is 15–25 kg N ha<sup>-1</sup> yr<sup>-1</sup><sup>141</sup> and Lowland meadows critical load is between 20-30 kg N ha<sup>-1</sup> year<sup>-1</sup><sup>142</sup> therefore, the increase in cars is not expected to reach the minimum threshold for these grasslands.

Figure 6.1 Screenshot from APIS results



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**.

## Wider Site

The proposals seek to narrow the existing road BOAT/paths and therefore increasing the opportunities for sensitive habitats to 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**.

## 6.4 NOTABLE PLANTS

### Proposed Welcome Building

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 welcome building. 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**.

### Wider Site

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**.

## 6.5 BREEDING BIRDS

### Proposed Welcome Building

#### *Operational*

The increase in vehicles and pedestrians to the welcome building and carpark will have a **Negligible (Not Significant) Effect** on qualifying species of the designations given the distance from the lagoon.

The presence of a welcome building and car park is predicted to increase the numbers of visitors to the wider site. The effects of this are described in the wider site operational impact assessment below.

### Wider site

Proposals estimate peaks of 150 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)<sup>43</sup>. 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**.

## 6.6 OVERWINTERING BIRDS

### Proposed Welcome Building

The increase in vehicles and pedestrians to the welcome building and carpark will have a **Negligible (Not Significant) Effect** on qualifying species of the designations given the distance from the lagoon.

The presence of a welcome building and car park is predicted to increase the numbers of visitors to the wider site. The effects of this are described in the wider site operational impact assessment below.

### Wider Site

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 5.2). 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**.

## 6.7 NATTERJACK TOADSK

### Proposed Welcome Building

The welcome building and car park area will remain unsuitable for natterjack toads post development. The welcome building and carpark 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 active, however given the unsuitability of the carparks and roads this is unlikely.

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

### Wider Site

The BOAT and paths will be re-surfaced and any potholes filled in leaving less opportunities for opportunistic natterjacks seeking refuge in pool formed in potholes which would reduce the chance of them being run-over by vehicles using the site. Additional habitat suitable for natterjack toads will be created and managed on site as part of the proposals, such as scrub clearance, pond and swale creation/restoration, fencing of ponds to reduce disturbance and degradation by dogs. The aim of this is to provide suitable breeding habitat for this species on site. There are no other predicted impacts on natterjack's during the operational phase of the development. Therefore, the impact is thought to be **Permanent, Positive (Not Significant) Effect at a National scale**.

## 6.8 REPTILES

### Proposed Welcome Building

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**.

### Wider Site

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**.

## 6.9 INVERTEBRATES

### Proposed Welcome Building

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**.

### Wider Site

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**.

## 6.10 BATS

### Proposed Welcome Building

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**.

### Wider Site

No further surveys were recommended as habitats of value will be retained and enhanced, additionally proposals seek to retain the dark landscape of the wider site 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)**.

## 6.11 BADGERS

### Proposed Welcome Building

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

### Wider Site

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

## 6.12 RIPARIAN MAMMALS

### Proposed Welcome Building

No impacts to riparian mammals are predicted from the operation of the welcome building given its distance from riparian habitat.



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## Wider Site

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**.

## 6.13 HEDGEHOG

### Proposed Welcome Building

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

### Wider Site

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

## 7.0 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.

### 7.1 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.

#### CEcMP

To ensure best practice is implemented during the construction phase and existing retained habitats on site and ecological receptors are protected, a CEcMP will be compiled prior to works commencing and secured through planning condition. This will specifically include, but may not be limited to:

## Noise and Vibration

Table 7.1 outlines noise and vibration issues requiring attention and identifies the control measures to be implemented.

Table 7.1 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	<p>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.</p> <p>Site compounds will be chosen to be as far from the lagoon as reasonably possible.</p> <p>Plant and equipment to be switched off when not in use.</p> <p>Plant and equipment to be maintained and operated in accordance with operators instruction and to ensure that excessive noise levels are not generated</p> <p>Regular integrity checks of noise mitigation measures fitted to items of plant</p> <p>Acoustics screens or enclosures for stationary or semi-stationary plant (e.g. generators) will be considered;</p> <p>Best practicable means will be included to control construction noise in the form of low noise emission plant, as specified in BS5228-1.</p> <p>Timing of works to avoid sensitive periods in order to reduce impacts on wildlife.</p>

## Materials and Waste

Table 7.2 outlines the materials and waste issues requiring attention and identifies the control measures to be implemented.

Table 7.2 *Materials and waste management*

Materials and waste issue	Control measure
Storage, handling and management of materials and waste	<p>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.</p> <p>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).</p> <p>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.</p>
Waste disposal strategy	<p>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 scrapyards or reused.</p>

### Air quality and dust emissions

 Table 7.3 *Air Quality, Dust and Emissions management*

Air Quality, Dust and Emissions issue	Control measure
Site set-up and operation	<p>Use of debris shields / mesh around all sides of the construction zone.</p>
Air quality and emissions	<p>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.</p> <p>Where reasonably practicable, fixed items of construction plant will be electrically powered in preference to diesel or petrol driven</p>
Dust/debris	<p>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.</p>
Monitoring	<p>Regular visual checks for dust, debris and emissions arising to be undertaken across the site and log of results maintained.</p>

### 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 wider site;
- 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 welcome building 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 ILP<sup>44</sup>; 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 an 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 CEcMP 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 guidance<sup>45</sup>. Bio-security principals inclusive of works exclusion zones will be followed throughout the construction to prevent the spread of invasive species.

## 7.2 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 welcome building 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, a CEcMP will be compiled prior to works commencing. This document will incorporate 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 CEcMP.

## 7.3 HABITATS

### Proposed Welcome Building

The loss of 156m<sup>2</sup> of Priority Lowland Meadow habitat requires bespoke mitigation and compensation.

Through narrowing the existing roads and the mounding on and surrounding the new building an additional 2649m<sup>2</sup> 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 steps<sup>46</sup>:

- 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.

The Government's 10% Biodiversity Net Gain targets do not apply to statutory designated sites or irreplaceable habitats. However, a provisional Biodiversity Impact Assessment (BIA) has been undertaken using the Defra 4.0 metric to demonstrate the gains and losses across the site. The development proposals have the potential to lead to a gain of 32.92% in biodiversity units in biodiversity units (ref: 551959ltMay23FV01\_BIA.). 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 will be set out within the CEMP, dust deposition during the construction will be controlled to a level that would not result in a significant effect on adjacent habitats.

### Wider Site

Minimal habitat loss is expected on habitat that are previously used as desire lines and already subject to high levels of trampling and small pockets of dense scrub. However, proposals will restore and gain approximately 17,012m<sup>2</sup> of natural habitat through the narrowing of roads/paths. The full details on methodology will be included in an LEMP.

Sensitive areas such as the Annex I 'Fixed coastal dunes with herbaceous vegetation (grey dunes) habitat' is currently subject to heavily trampling (see Figure 7.1). 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 7.1 '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 7.2 Examples of pathway formalisation



The road and path network along the sea wall is much wider than the area required for one car and pedestrians. Proposals seek to narrow this area and give the rest back to nature. It is recommended that an Open Mosaic Habitat could be created using the materials from the road which will be seeded with 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 7.3 The excessively wide road along the sea wall (Photo taken in February 2023)



Open mosaic habitat may not be the most aesthetically pleasing but would be in keeping with the existing wildness of the site which is intertwined with remnants of the ironworks. Signage will be incorporated raise awareness of the value of this habitat type.

Figure 7.4 Jardin des Joyeux (Wagon Landscaping)



## 7.4 NOTABLE PLANTS

### Proposed Welcome Building

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 CEcMP and LEMP as appropriate.

### Wider Site

There is no habitat loss and consequently no notable species loss is expected as a result of the formalising of the paths. It is expected that a total of 17,012m<sup>2</sup> will be restored and gained through the narrowing of roads and therefore giving more opportunities for notable species to flourish.

The Irish dandelion specimen was located alongside the existing access road for the Household Waste Recycling Centre. Therefore, this plant will be protected through wire mesh security fencing to create a buffer zone of at least 3m and ensure that this is not harmed through any construction activities.

## 7.5 BREEDING BIRDS

### Proposed Welcome Building

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.

### Wider Site

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- 111.5dBA<sup>47</sup> 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 motorboats<sup>48</sup> 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.

## 7.6 OVERWINTERING BIRDS

### Proposed Welcome Building

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

## Wider site

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.

## 7.7 NATTERJACK TOADS

### Proposed Welcome Building

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 CEcMP 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.

## Wider Site

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 CEcMP and LEMP.

## 7.8 REPTILES

### Proposed Welcome Building

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 CEcMP and LEMP as appropriate.

### Wider site

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.

## 7.9 INVERTEBRATES

### Proposed Welcome Building

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.

#### Wider site

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

## 7.10 AMPHIBIANS

### Proposed Welcome Building

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.

#### Wider Site

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.

## 7.11 BATS

### Proposed Welcome Building

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 endoscopy 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.

## Wider site

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.

## 7.12 BADGER

### Proposed Welcome Building

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.

### Wider Site

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.

## 7.13 OTTER

### Proposed Welcome Building

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.

### Wider Site

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.

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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.

## 7.14 HEDGHOG

### Proposed Welcome Building

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.

### Wider Site

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



## 8.0 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.

### 8.1 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.

### 8.2 DESIGNATED SITES

#### Proposed Welcome Building

The drainage strategy has been designed to ensure neutral effects on the lagoon. The operational impact associated with the increase in visitors on the designated site is provided in detail below.

#### Wider site

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 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 7.1). 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.

## 8.3 HABITATS

### Proposed Welcome Building

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 between one of the existing carparks and the area proposed for the welcome building. 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.

Research suggests that signage is an effective way of reducing disturbance caused by visitors at unmanaged wildlife sites<sup>49</sup> 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 will be cordoned off, such as with roped paths, to deter people from walking across the open grassland. Sufficient provision of dog bins and litter bins around the carpark and welcome building should encourage site visitors to use these and reduce opportunities for littering. The Welcome Building 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 carparks and on newly constructed roads and an increase dog faeces for example. A buffer of tree and scrub habitat will be retained or planted surrounding areas of new roads, carparks to provide a physical barrier and filter some of the pollutants<sup>50</sup>. It is recommended that a grazing regime covers this area as grazing can prevent soil nutrient accumulation, to remove small populations of invading plant species<sup>51</sup>. Signs will be installed around the carpark to inform visitors the carparks 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.

## Wider Site

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 welcome building 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 welcome building 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.

## 8.4 NOTABLE PLANTS

### Proposed Welcome Building

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.

## Wider Site

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

## 8.5 BREEDING BIRDS

### Proposed Welcome Building

The presence of a welcome building and car park is predicted to increase the numbers of visitors to the wider site. The mitigation measures for this are described in the wider site section below.

## Wider Site

The proposals seek to fortify and extend the existing bund along the sea wall BOAT as well as narrow the existing path and access drive along the BOAT and move it 1m further away from the tern island.

Despite an increase in visitors the bund will ensure that this increase will be visibly unnoticeable to the terns. Furthermore, in narrowing the access drive, 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 sites<sup>52</sup>.

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.

## 8.6 OVERWINTERING BIRDS

### Proposed Welcome Building

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

### Wider site

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 narrowing of the existing BOAT 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.

## 8.7 NATTERJACK TOADS

### Proposed Welcome Building

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

## Wider Site

The natterjacks were confirmed not present within the swales/ponds on site, and therefore no operational impacts upon natterjack toads, there are no required mitigation actions.

Proposals seek to increase the available breeding habitat for natterjack toads through swale creation and existing swale restoration. Ponds will be fenced off to prevent disturbance from dogs and increase suitability for natterjacks.

## 8.8 REPTILES

### Proposed Welcome Building

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.

### Wider site

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.

## 8.9 INVERTEBRATES

### Proposed Welcome Building

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.

### Wider site

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.

## 8.10 AMPHIBIANS

### Proposed Welcome Building

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

## Wider Site

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

### 8.11 BATS

#### Proposed Welcome Building

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 welcome building. The welcome building 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 ILP<sup>53</sup>:

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.

#### Wider site

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.

### 8.12 BADGER

#### Proposed Welcome Building

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

#### Wider Site

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

### 8.13 OTTER

#### Proposed Welcome Building

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

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## Wider Site

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

## 8.14 HEDGHOG

### Proposed Welcome Building

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

## Wider Site

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

## 9.0 ENHANCEMENT MEASURES

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

### 9.1 BIODIVERSITY IMPACT ASSESSMENT

In accordance with the National Planning Policy Framework, local policy drivers and recent changes to the legislative context, (Appendix A), proposals aspire to a minimum of 10% net gain in biodiversity, which should be evidenced through a Biodiversity Impact Assessment (BIA) using the Natural England Biodiversity 4.0 metric<sup>54</sup>. The BIA report (ref: 551959ltMay23FV02\_BIA) demonstrates that development proposals will exceed local and national targets with a 32.92% 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;
- Narrowing existing roads/paths and closing desire lines;
- A total of 18,552m<sup>2</sup> hardstanding across the entire site will be given back to nature, to be sown with seed mix from adjacent international and priority habitat mix;
- Enhancing the Annex I Semi-natural dry grasslands and scrubland facies on calcareous substrates from Moderate condition to Good;
- Open Mosaic Habitat creation;
- Conservation grazing to effectively manage scrub encroachment; and
- Removal of invasive species within the development footprint.

### 9.2 CONSERVATION GRAZING

In keeping with RSPB visions for the reserve, major works are required to remove large areas of maturing scrub as well as a management regime of extensive grassland and scrub. Due to limited resources RSPB can only contribute to some scrub clearance once a year, with the aid of volunteers. The site has large areas of dense scrub encroachment and the sensitive habitats are at risk of habitat succession into scrub in the absence of management.

The scrub adds to the habitat heterogeneity of the site which is of value for many breeding birds and invertebrates as well as being visually interesting to site users. The aim would not be to eradicate scrub entirely however through introduction of conservation grazing by cattle or goats will create glades, rides and prevent scrub encroachment on sensitive habitats. The prevention of dense scrub forming will overall increase the structural diversity of the site and benefit the habitats, notable plants, birds, invertebrates and amphibians. Once the major clearance of scrub has taken place, it is recommended that cattle are introduced. This will contribute to the overall enhancement of the condition of the scrub and is reflected within the BIA.



It is recommended that a detailed Grazing Management Plan can be incorporated into a LEMP or as a stand-alone document (both secured by condition). This will include monitoring measures to ensure that habitat enhancement works are successfully delivered and managed accordingly. 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.

### 9.3 BIRD FEATURES

#### Additional tern islands

Additional tern islands of 0.5ha will be created at a further distance from the BOAT to ensure that there are continued opportunities for nesting. This could be either in the form of a similar slag heap island or floating islands. This is in keeping with RSPB's future vision for the site. Decoy terns could be used to encourage nesting if necessary, although it is expected that the existing number of terns breeding on site will be sufficient.

Figure 9.1 Examples of tern rafts by Rutland water (left) and decoy terns used by Hampshire and Isle of Wight Wildlife Trust (right)



#### Floating islands

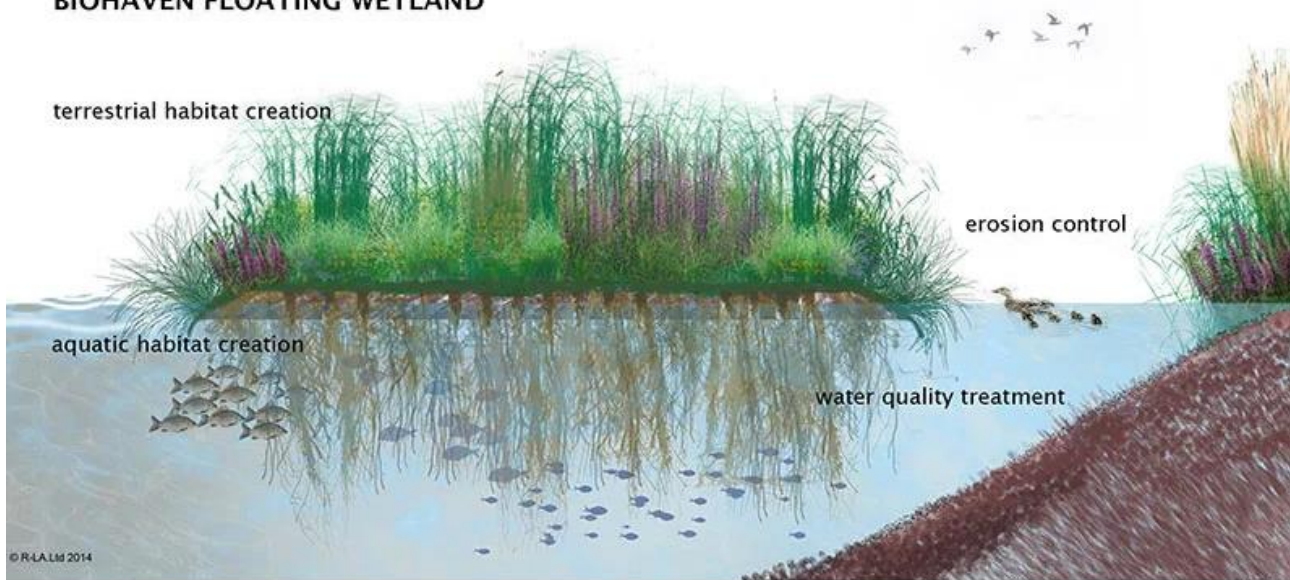
Floating vegetated island will be provided in the other small lakes on site. Many species such as great-crested grebes (*Podiceps cristatus*) and little grebes (*Tachybaptus ruficollis*) use vegetated floating islands<sup>55</sup>. These typically comprise a floating framework with pre-planted vegetation growing in coir rolls similar. Island construction should allow for trailing root networks to encourage fish grazing and shelter. Hanging ropes will also be provided beneath frameworks to encourage fish aggregation.

Grazing protection should be provided to discourage large species such as Canada geese which can damage vegetation and form flight safety risk.

Figure 9.2 Examples of floating island



### BIOHAVEN FLOATING WETLAND



### Sand martin tunnels

There are some records for sand martins on site. It is recommended that artificial sand martin banks are installed along the old sea wall.

Figure 9.3 Artificial sand martin bank



## 9.4 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 situations<sup>56</sup>. 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 9.4 Example of natterjack pond creation by Denbighshire Countryside Service



There were several mitigation ponds created in 2017 however according to the Amphibian and Reptile Conservation officer these have rapidly become less suitable due to scrub encroachment and no ongoing management. Therefore, the recommended conservation grazing will help maintain the short sward height required for natterjack populations to use the site again. Proposals seek to fence off these existing mitigation ponds which will reduce disturbance from humans and dogs.

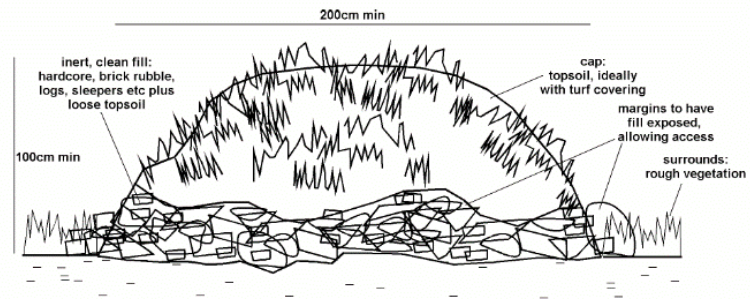
Should the recommended monitoring surveys identify that Natterjacks have not dispersed onto site then remedial actions will include either discussions with local landowners to create suitable connecting habitat from existing breeding areas or a translocation exercise will be explored.

## 9.5 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 9.5 Reptile enhancement features (piles of brash left, hibernacula right)<sup>57</sup>



## 9.6 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 bee hives 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 9.6 Invertebrate features- Bug hotels (left, centre), Butterfly bunds (right)



## 9.7 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 9.7 Summer roosting boxes (left) maternity roosting boxes (middle) and hibernation roosting boxes (right)



## 9.8 HEDGEHOG HOUSES

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

Figure 9.8 Example of hedgehog house



## 9.9 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 9.9 Examples of interpretation boards



### Sightings boards

To further encourage engagement and citizen science opportunities, sightings boards will be installed by the welcome building. 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 9.10 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 9.11 Thamesmead volunteer programme building floating reedbeds



## 10.0 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.

### 10.1 STATUTORY SITES

#### Proposed Welcome Building

##### Construction

No direct construction impacts of the welcome building 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.

#### Wider Site

##### 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)**.

## 10.2 HABITATS

### Proposed Welcome Building

#### Construction

Assuming the mitigation measures are implemented, the proposals will adequately compensate for the loss of Lowland meadow habitat through the gains of 2649m<sup>2</sup> 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.

### Wider Site

#### 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 seek to create and restore approximately 17,012m<sup>2</sup> of vegetation that is currently hardstanding or subject to extensive trampling. 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**).

## 10.3 NOTABLE PLANTS

### Proposed Welcome Building

#### 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 2649m<sup>2</sup> 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.

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## Wider Site

### Construction

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

The proposals will seek to create and restore approximately 17,012m<sup>2</sup> of habitats that is currently hardstanding or subject to extensive trampling. 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.

## 10.4 BREEDING BIRDS

### Proposed Welcome Building

#### 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.

## Wider Site

### 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.

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## 10.5 OVERWINTERING BIRDS

### Proposed Welcome Building

#### 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**.

### Wider Site

#### 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.

## 10.6 NATTERJACK TOADS

### Proposed Welcome Building

#### 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.

### Wider Site

#### 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)**.

## 10.7 REPTILES

### Proposed Welcome Building

#### 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.

### Wider Site

#### 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.

## 10.8 INVERTEBRATES

### Proposed Welcome Building

#### 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.

## Wider Site

### Construction

The development will give 17,012m<sup>2</sup> of hardstanding back to nature, 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.

## 10.9 AMPHIBIAN

### Proposed Welcome Building

#### 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**.

## Wider Site

### 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**.

## 10.10 BATS

### Proposed Welcome Building

#### 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.

### Wider Site

#### 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**.

## 10.11 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**.

### Wider Site

#### 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**.

## 10.12 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**.

### Wider Site

#### 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**.

## 10.13 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**.

### Wider Site

#### 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**.

## 11.0 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 11.1 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	Welcome Building	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
	Wider Site	Increased noise, visual activity and lighting disturbing qualifying breeding and overwintering birds.	Temporary to Permanent, Negative (Significant) Effect at an International Scale	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>	Neutral Residual Effect
		Habitat degradation of 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	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Habitats	Welcome Building	Loss of 156sqm of 1891sqm of regionally important Priority Lowland Meadow habitat	Permanent Negative (Significant) Effect at a Regional scale.	<ul style="list-style-type: none"> <li>Compensatory lowland meadow planting through translocation and sowing seed mix</li> </ul>	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.	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>	
		As a result of the proposals 1540m <sup>2</sup> 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	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>	Permanent, Positive Residual Effect ranging from between Local and International scale (Significant)
		The proposals will seek to create and restore approximately 17,012m <sup>2</sup> of vegetation that is currently hardstanding or subject to extensive trampling.	Permanent, Positive (Significant) Effect at a Regional to National Scale.	n/a	
Notable Plants	Welcome Building	Loss of notable plant species during the removal of lowland meadow habitat	Loss of fern grass will result in a Permanent, Negative (Not Significant) Effect at a Regional scale The removal of carline thistle, wild strawberry, quaking grass and eye bright the removal of	<ul style="list-style-type: none"> <li>Buffer zones around existing plants and retained areas</li> <li>Compensatory planting through translocation and sowing seeds of the notable plants</li> </ul>	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)	
			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.	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>		
		Narrow the existing road into the width of a footpath and therefore expanding the opportunities for these plants to grow	Permanent, Positive (Not Significant) Effect at a Local and Regional scale.	n/a		
	Wider Site		Disturbance through trampling, dust deposition, pollution events and additional runoff.	Negative (Significant) Effect at a Local, Regional and International scale.	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>	Permanent, Positive Residual Effect at a Local to International scale (Significant)
			Narrow the existing road into the width of a footpath and therefore expanding the opportunities for these plants to grow	Permanent, Positive (Significant) Effect varying from a Local, National and International 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)
Breeding birds	Welcome Building	Scrub clearance to facilitate the development of the building and carpark. 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	<ul style="list-style-type: none"> <li>Seasonal timing of clearance to avoid nesting bird (March-August, inclusive)</li> <li>Or Suitably Qualified Ecologist confirms absence of nesting</li> </ul>	Neutral Residual Effect
		Loss of scrub nesting habitat available due to the development.	Permanent, Negative (Not Significant) Effect within the Zone of Influence only	<ul style="list-style-type: none"> <li>Enhancement and planting of scrub habitat across the wider site</li> </ul>	
	Wider Site	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.	<ul style="list-style-type: none"> <li>Seasonal timing of clearance to avoid nesting bird (March-August, inclusive)</li> </ul>	Neutral Residual Effect
Over Wintering Birds	Welcome Building	Loss of scrub foraging and sheltering habitat for common passerine birds.	Permanent, Negative (Not Significant) Effect within the Zone of Influence	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)
	Wider Site	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.	<ul style="list-style-type: none"> <li>Higher concentration of works take place outside sensitive season</li> <li>Acoustic screens</li> <li>ECoW presence for works during sensitive season</li> </ul>	Neutral Residual Effect
Natterjack Toads	Welcome Building	Potential risk for the killing or injuring natterjack toad as a result of the construction activity on site.	Negative (Significant) Effect at the National scale.	<ul style="list-style-type: none"> <li>General best practice set out in section 7.7</li> <li>Amphibian Mitigation Plan within the CEMP and LEMP</li> </ul>	Neutral Residual Effect
	Wider Site	Potential risk for the killing or injuring natterjack toad as a result of the construction activity on site.	Negative (Significant) Effect at the National scale.	<ul style="list-style-type: none"> <li>General best practice set out in section 7.7</li> <li>Amphibian Mitigation Plan within the CEMP and LEMP</li> </ul>	Neutral Residual Effect
Reptiles	Welcome Building	Site clearance in this area has the potential to result in the killing and injury of reptile species	Permanent, Negative (Significant) Effect within the Zone of Influence only.	<ul style="list-style-type: none"> <li>A specific Reptile Mitigation Plan will be produced which could be incorporated into the CEcMP and LEMP as appropriate.</li> <li>ECOW present during sensitive works</li> </ul>	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)
	Wider site	Site clearance in this area has the potential to result in the killing and injury of reptile species	Permanent, Negative (Significant) Effect within the Zone of Influence only.	<ul style="list-style-type: none"> <li>General best practice set out in section 7.8</li> <li>Reptile Mitigation Plan within the CEMP and LEMP</li> </ul>	Neutral Residual Effect
		17,012m <sup>2</sup> of hardstanding and heavily trampled habitat will be given back to nature providing more opportunities for reptiles	Permanent, (Significant) Effect at Zone of Influence only.	n/a	
Invertebrates	Welcome Building	Loss of scrub and lowland meadow	Temporary, Negative (Not significant) Effect within the zone of influence only.	<ul style="list-style-type: none"> <li>Habitat compensation through scrub enhancement and planting</li> </ul>	Permanent, Positive Residual Effect at a Local to District scale (Significant)
		1540m <sup>2</sup> of hardstanding will be given back to nature providing more opportunities for invertebrates	Permanent, (Significant) Effect at District scale.	n/a	
	Wider Site	Habitat loss in the form of loss of scrub and lowland meadow	Temporary, Negative (Insignificant) Effect within the zone of influence only	<ul style="list-style-type: none"> <li>Habitat lost will be compensated for and maintained as open habitats to benefit invertebrates</li> </ul>	



Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
		17,012m <sup>2</sup> of hardstanding/heavily trampled habitat will be given back to nature providing more opportunities for invertebrates.	Permanent, Positive (Significant) Effect at National scale.	n/a	Permanent, Positive Residual Effect at a Local to District scale (Significant)
Amphibians	Welcome Building	Site scrub clearance resulting in the killing and injury of amphibian species	Negative (Significant) Effect within the Zone of Influence only.	<ul style="list-style-type: none"> <li>A specific Amphibian Mitigation Plan will be produced which could be incorporated into the CEcMP and LEMP as appropriate.</li> <li>ECOW present during sensitive works</li> </ul>	Neutral Residual Effect
	Wider site	Pockets of scrub clearance resulting in the killing and injury of amphibian species	Negative (Significant) Effect within the Zone of Influence only.	<ul style="list-style-type: none"> <li>A specific Amphibian Mitigation Plan will be produced which could be incorporated into the CEcMP and LEMP as appropriate.</li> <li>ECOW present during sensitive works</li> </ul>	Neutral Residual Effect
Bats	Welcome Building	Scrub clearance may reveal roosting features in trees within areas of currently dense scrub. The clearance of trees with roosting features could result in	Negative (Significant) Effect at the Local scale.	<ul style="list-style-type: none"> <li>Clearance done with presence of ECoW</li> <li>Any bat features be identified then works will cease and the SQE</li> </ul>	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)
		the killing and injury of bats, and loss of roosts/potential roosts		<p>will carry out a bat endoscopy survey</p> <ul style="list-style-type: none"> <li>CEMP to include daylight working hours and measures to avoid light spill if necessary</li> </ul>	
	Wider Site	Scrub clearance may reveal 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.	<ul style="list-style-type: none"> <li>Clearance done with presence of ECoW</li> <li>Any bat features be identified then works will cease and the SQE will carry out a bat endoscopy survey</li> <li>CEMP to include daylight working hours and measures to avoid light spill if necessary</li> </ul>	Neutral Residual Effect
Badgers	Welcome Building	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.	<ul style="list-style-type: none"> <li>Clearance done with presence of ECoW. Works will be stopped if any potential badger holes found and monitoring will be undertaken</li> </ul>	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)
	Wider Site	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.	<ul style="list-style-type: none"> <li>Clearance done with presence of ECoW. Works will be stopped if any potential badger holes found and monitoring will be undertaken</li> </ul>	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.	<ul style="list-style-type: none"> <li>CEMP to include daylight working hours and measures to avoid light spill if necessary</li> <li>Trenching and excavations to be covered each night</li> </ul>	
		17,012m <sup>2</sup> of hardstanding /heavily trampled habitat will be given back to nature providing more foraging opportunities for badgers	Permanent, Positive (Not Significant) Effect within the Zone of Influence only.	n/a	
		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.	<ul style="list-style-type: none"> <li>Scrub clearance done with presence of ECoW. Works will be stopped if any signs of riparian</li> </ul>	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	Welcome Building	damage or destroy their breeding sites and resting places		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.	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>	
	Wider site	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.	<ul style="list-style-type: none"> <li>Scrub clearance done with presence of ECoW. Works will be stopped if any signs of riparian mammals detected and monitoring will be undertaken</li> <li></li> </ul>	
		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.	<ul style="list-style-type: none"> <li>Following General Best Practice in Section 7.1 of this report</li> <li>Production of a CEcMP, recommended for condition</li> </ul>	

Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
Hedgehog	Welcome Building	Clearance of scrub may lead to the killing or injuring of hedgehog	Negative (Significant) Effect within the Zone of Influence only.	<ul style="list-style-type: none"> <li>Scrub vegetation will be cleared in a phased manner</li> <li>In the event that hedgehogs are found, the ECoW will remove them and place them in suitable habitat that is earmarked for retention</li> </ul>	Neutral Residual Effect
	Wider Site	Clearance of scrub may lead to the killing or injuring of hedgehog	Negative (Significant) Effect within the Zone of Influence only.	<ul style="list-style-type: none"> <li>Any scrub vegetation will be cleared in a phased manner</li> <li>Clearance done with presence of ECoW</li> <li>In the event that hedgehogs are found, the ECoW will remove them and place them in suitable habitat that is earmarked for retention</li> </ul>	Neutral Residual Effect
Operational					
	Welcome Building	Increased runoff and foul water onto site	Permanent, Negative (Significant) Effect at an International scale	<ul style="list-style-type: none"> <li>Surface water attenuation with a combination of permeable paving and open swales</li> </ul>	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)
Designated Sites				<ul style="list-style-type: none"> <li>• Treatment to upper portion provided by a downstream defender and open swales</li> <li>• Foul water treated on site and treated effluent discharged to the lagoon</li> </ul>	
	Wider Site	Recreational pressure in the form of human disturbance to qualifying species	Permanent, Negative (Significant) Effect at an International scale	<ul style="list-style-type: none"> <li>• Fortify and extend the existing bund along the sea wall BOAT</li> <li>• Narrow the existing path and access drive along the BOAT and move it 1m further away from tern island and lagoon</li> <li>• Reduce access for kayakers and paddle boarders</li> <li>• Reduce opportunities for anti-social driving along the BOAT</li> <li>• Provision of signs raising awareness and educating on the importance and rarity of plants</li> <li>• Continued presence of tern warden</li> <li>• Additional island creation for nesting</li> </ul>	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	Permanent, Negative (Significant) Effect at an International scale	<ul style="list-style-type: none"> <li>Formalising paths to discourage visitors from trampling sensitive habitats</li> <li>Provision of signs educating on the importance and rarity of habitats</li> <li>Provision of dog waste bins and litter bins</li> <li>On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species</li> </ul>	
Habitats	Welcome Building	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.	<ul style="list-style-type: none"> <li>Provision of signs educating on the importance and rarity of habitats</li> <li>Scrub buffer planting around carparks and access drives</li> <li>Provision of dog waste bins and litter bins</li> <li>On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species</li> </ul>	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.	<ul style="list-style-type: none"> <li>Scrub buffer planting around carparks and access drives</li> <li>Provision of dog waste bins</li> <li>Conservation grazing to prevent soil nutrient accumulation</li> </ul>	
		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	
	Wider Site	Narrow the existing road into the width of a footpath and therefore increasing the opportunities for sensitive habitats to expand	Permanent, Positive (Significant) Effect at a Regional, National and International scale.	n/a	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.	<ul style="list-style-type: none"> <li>Formalising paths to discourage visitors from trampling sensitive habitats</li> <li>Provision of signs educating on the importance and rarity of habitats</li> <li>Provision of dog waste bins and litter bins</li> </ul>	



Receptor	Location	Characterisation of unmitigated impact on the feature	Effect without mitigation	Mitigation and Enhancement	Significance of effects of residual impacts (after mitigation)
				<ul style="list-style-type: none"> <li>On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species</li> </ul>	
		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	Welcome Building	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.	<ul style="list-style-type: none"> <li>Formalising paths to discourage visitors from trampling sensitive habitats</li> <li>Provision of signs educating on the importance and rarity of plants</li> <li>Provision of dog waste bins and litter bins</li> <li>On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species</li> </ul>	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)
		The proposals will bring long-term management for a period of at least 30 years	Permanent, Positive (Significant) Effect at a Regional and National scale.	n/a	
	Wider Site	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.	<ul style="list-style-type: none"> <li>Formalising paths to discourage visitors from trampling sensitive habitats</li> <li>Provision of signs raising awareness and educating on the importance and rarity of plants</li> <li>Provision of dog waste bins and litter bins</li> <li>On-going management and monitoring for 30 year period with remedial actions to include removal of invasive plant species</li> </ul>	Permanent, Positive Residual Effect on notable plant communities ranging from between Local and International scale.
		Long-term management to the site for a period of at least 30 years	Permanent, Positive (Significant) Effect at a Regional and 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)
Breeding bird	Welcome Building	None	Negligible (Not Significant)	<ul style="list-style-type: none"> <li>n/a</li> </ul>	Neutral Residual Effect
	Wider Site	Proposals estimate peaks of 150 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.	Permanent Negative (Significant) Effect at an International scale.	<ul style="list-style-type: none"> <li>Fortify and extend the existing bund along the sea wall BOAT</li> <li>Narrow the existing path and access drive along the BOAT and move it 1m further away from tern island and lagoon</li> <li>Reduce access for kayakers and paddle boarders</li> <li>Reduce opportunities for anti-social driving along the BOAT</li> <li>Provision of signs raising awareness and educating on the importance and rarity of plants</li> <li>Continued presence of tern warden</li> <li>Additional island creation for nesting</li> </ul>	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	Welcome Building	None	Negligible (Not Significant)	<ul style="list-style-type: none"> <li>n/a</li> </ul>	Neutral Residual Effect
	Wider Site	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.	Permanent Negative (Significant) Effect at an International scale.	<ul style="list-style-type: none"> <li>Fortify and extend the existing bund along the sea wall BOAT</li> <li>Narrow the existing path and access drive along the BOAT and move it 1m further away from tern island and lagoon</li> <li>Reduce access for kayakers and paddle boarders</li> <li>Reduce opportunities for anti-social driving along the BOAT</li> <li>Provision of signs raising awareness and educating on the importance and rarity of plants</li> </ul>	Neutral Residual Effect
	Welcome Building	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	Wider site	The roads will be re-surfaced and any potholes filled in leaving less opportunities for opportunistic natterjacks seeking refuge in pool formed in potholes which would reduce the chance of them being run-over by vehicles using the site.	Permanent, Positive (Not Significant) Effect at a National scale.	n/a	Permanent Positive Residual Effect at a National level (Significant)
		As part of the drainage strategy, swales suitable for Natterjacks will be created	Permanent, Positive (Significant) Effect at a National scale.	n/a	
Reptiles	Welcome Building	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.	<ul style="list-style-type: none"> <li>Formalisation of paths</li> <li>Signage will be also used to provide information about their ecology, identification tips and give a deeper understanding of the reptiles present</li> <li>Increased refugia across the site in locations where walkers and dogs will be discouraged</li> </ul>	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)
	Wider Site	Increased disturbance and harm from people and dogs	Permanent Negative (Not Significant) Effect at a Local scale.	<ul style="list-style-type: none"> <li>Formalisation of paths</li> <li>Signage will be also used to provide information about their ecology, identification tips and give a deeper understanding of the reptiles present</li> <li>Increased refugia across the site</li> </ul>	Neutral Residual Effect
Invertebrates	Welcome Building	The development ensures the long-term management commitment to habitats that would otherwise scrub over and result in a homogenous habitat	Permanent, Positive (Significant) Effect at District scale.	n/a	Permanent, Positive effect at District Level (Significant)
	Wider Site	The development ensures the long-term management commitment to habitats that would otherwise scrub over and result in a homogenous habitat	Permanent, Positive (Significant) Effect at District scale	n/a	Permanent, Positive effect at District Level (Significant)
Amphibians	Welcome Building	Increased disturbance and harm from people and dogs	Permanent Negative (Not Significant) Effect at a Local scale.	<ul style="list-style-type: none"> <li>Formalisation of paths</li> <li>Signage will be also used to provide information about their ecology, identification tips</li> <li>Increased refugia across the site</li> </ul>	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)
Amphibians	Wider Site	Increased disturbance and harm from people and dogs	Permanent Negative (Not Significant) Effect at a Local scale.	<ul style="list-style-type: none"> <li>Formalisation of paths</li> <li>Signage will be also used to provide information about their ecology, identification tips</li> <li>Increased refugia across the site</li> </ul>	Neutral Residual Effect
Bats	Welcome Building	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.	<ul style="list-style-type: none"> <li>A bat sensitive lighting strategy will be in place subject to curfews and motion sensors.</li> </ul>	Neutral Residual Effect
	Wider Site	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
Badgers	Welcome Building	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
	Wider Site	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	Welcome Building	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
	Wider Site	Reduced use of the site by otters due to increased numbers of visitors and dogs; otters are a secretive species and are deterred by human disturbance.	Permanent, Negative (Not Significant) Effect at a Local scale	<ul style="list-style-type: none"> <li>Enhancement of scrub habitat leaving opportunities for otters to shelter</li> </ul>	Neutral Residual Effect
Hedgehog	Welcome Building	None	Negligible (Not Significant)	n/a	Neutral Residual Effect
	Wider Site	None	Negligible (Not Significant)	n/a	Neutral Residual Effect



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## 12.0 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 incorporates the findings of two PEA reports and results of the Phase II Surveys completed in 2021 and 2022 by Appletons and third party ecology contractors and carried out to support a planning submission for the site which seeks *"erection of welcome building with café, retail space, staff facilities and car park, repair and stabilisation works at Hodbarrow Beacon, repair and stabilisation works and installation of 'camera obscura' structure at Towsey Hole Windmill, installation of cladding and new living roof to existing bird hide, erection of new bird hides and viewing platforms, creation of new multi-use pathways with signage, gateway features and street furniture, making good of existing byway (BOAT) along sea wall, enhancement of wildlife habitats, and associated access, landscaping and drainage infrastructure."*

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 CEcMP 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 Biodiversity Impact Assessment (BIA) has been undertaken using the Defra 4.0 metric which confirms, with the appropriate incorporation of the landscaping features, that the development overall will lead to a net gain in biodiversity value post development. See the BIA report for further details (Doc Ref: 551959ltMay23FV02\_BIA).

## APPENDIX A RELEVANT LEGISLATION AND POLICY

### A.1 LEGISLATION

Current key legislation relating to ecology includes The Environment Act<sup>58</sup> Wildlife and Countryside Act 1981 (as amended)<sup>59</sup>; The Conservation of Habitats and Species Regulations 2019 ('Habitats & Species Regulations')<sup>60</sup>, The Countryside and Rights of Way Act 2000 (CRoW Act)<sup>61</sup>, and The Natural Environment and Rural Communities Act, 2006<sup>62</sup>.

#### The Environment Act, 2021

The Environment Act, 2021 will mandate the requirement for new development in England to deliver a minimum 10% biodiversity net gain (BNG), as measured by the agreed metric (the current relevant version being the Natural England metric 3.0), 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)<sup>63</sup>, and transpose Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora ('EU Habitats Directive')<sup>64</sup>, and Council Directive 79/409/EEC on the Conservation of Wild Birds ('Birds Directive')<sup>65</sup> 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 Habitats<sup>66</sup> (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 Plan<sup>67</sup> (UK BAP). Despite the devolution of the UK BAP and succession of the UK Post-2010 Biodiversity Framework<sup>68</sup> (and Biodiversity 2020 strategy<sup>69</sup> in England), as a response to the Convention on Biological Diversity's (CBD's) Strategic Plan for Biodiversity 2011-2020<sup>70</sup> and EU Biodiversity Strategy (EUBS)<sup>71</sup>, 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.

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## 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 Annexe 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.

## A.2 PLANNING POLICY

### National

#### National Planning Policy Framework

The National Planning Policy Framework (NPPF) 2021<sup>72</sup> 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

### Regional

#### Copeland Local Plan 2017-2035 (Preferred Options Draft)<sup>73</sup>

##### *Policy DS5PO: Development Principles*

In order to achieve sustainable development in the Borough and meet Local Plan objectives, development must, where possible:

Mitigation of and adaption to climate change

- Minimise carbon emissions, maximise energy efficiency and help us to mitigate and adapt to the effects of climate change
- Be located on sites where there is no risk of flooding and where the development does not increase the risk of flooding elsewhere

- Protect, enhance and create new areas of green infrastructure, recognising the important role that the natural environment and healthy ecosystems have to play in the future social and economic, as well as environmental sustainability of Copeland
- Make the most efficient use of land by building at appropriate densities and reusing existing buildings and previously developed land
- Minimise waste, maximise opportunities for recycling and use sustainable construction methods, taking into account circular economy principles
- Be located on sites which minimise the need to travel, with good, safe pedestrian links to services and facilities.

Protection, enhancement and restoration of the Borough's valued natural and cultural assets

Protect and enhance areas, sites, species and features of biodiversity or geodiversity value, important landscapes and the undeveloped coast including valued landscapes which form a setting to the Lake District National Park and areas of Heritage Coast.

- Conserve and enhance the Borough's cultural and heritage assets and their settings
- Provide and enhance recreational opportunities for the Borough's residents and its visitors, protecting existing provision where possible and ensuring that future development meet appropriate standards in terms of quantity and quality
- Protect the Borough's best and most versatile agricultural land from development
- Support the reclamation and redevelopment or restoration of the Borough's vacant or derelict sites, whilst taking account of landscape, biodiversity and historic environment objectives
- Minimise air, ground and water pollution, ensuring that development does not have a negative impact upon water quality (including waterbodies and bathing waters)

Creation and retention of quality places

- Be of high quality in terms of design so that it retains and enhances locally distinctive places and raises aspirations
- Provide or safeguard good levels of residential amenity and security, reducing the fear of crime and minimising the opportunities for crime and anti-social behaviour
- Be supported by the relevant infrastructure, ensuring it can accommodate traffic and access arrangements in ways that make it safe and convenient for pedestrians and cyclists to move around
- Address land contamination with appropriate remediation measures

Healthy Communities

- Adopt dementia-friendly design principles
- Provide opportunities for food growing
- Contribute to the creation of mixed communities, helping to reduce social isolation and create community resilience

- Retain and enhance valuable community facilities (including healthcare, cultural and education facilities)
- Include community energy generation to provide low carbon heat and/or power and address energy poverty
- Enhance local pedestrian links to promote physical activity

### *Policy DS6PO: Planning Obligation*

1. Where it is reasonable, necessary and directly related to the development Copeland Borough Council, through planning obligations (until such time an alternative method is introduced), will

secure:

- a) The enhancement of existing or provision of new infrastructure, facilities and services
  - b) Where appropriate future maintenance of car parking provision and sustainable transport solutions will be required in perpetuity;
  - c) Future maintenance and/or monitoring of other facilities delivered as a result of development for a period of 15 years or as agreed/identified in a specific Development Plan policy;
  - d) Future management and monitoring of biodiversity net gain will be required for a period of 30 years
2. The Council will expect planning obligations to be provided on site unless specific circumstances make off-site contributions more appropriate and;
3. When determining the nature and scale of any planning obligations sought, account will be taken of specific site conditions, the Infrastructure Delivery Plan and other material considerations.

Where an applicant considers that the provision of appropriate infrastructure would make the development unviable a viability assessment must be submitted to, and agreed by the Council, as early as possible within the planning application process.

### *Policy N1PO Conserving and Enhancing Biodiversity and Geodiversity*

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

Proposals must demonstrate, to the satisfaction of the Council, that the following sequential steps 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 of 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 Natura 2000 site, 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 sites as a whole is protected.

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

Sustainable construction methods should be used where possible.

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

### *Policy N2PO: Biodiversity Net Gain*

All development, with the exception of that listed in paragraph 49.8.10 above, must provide a minimum of 10% biodiversity net gain over and above existing site levels. This is in addition to any compensatory habitat provided under Policy N1PO. Net gain should be delivered on site where possible. Where on-site provision is not appropriate, provision must be made elsewhere in order of the following preference:

1. Off site in an area identified as a Local Nature Recovery Network;
2. Off site on an alternative suitable site within the Borough
3. Through the purchase of an appropriate amount of national biodiversity units/credits.

Details must be submitted to, and agreed in writing by the Council, before the development can commence.

Sites where net gain is provided (on or off site) must be managed and monitored by the applicant or an appropriate body funded by the applicant for a minimum period of 30 years. Annual monitoring reports detailing the sites 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 Boroughs protected habitats and species in order to reduce its biodiversity value their deteriorated condition will not be taken into consideration and previous ecological records of the site and/or the ecological potential of the site will be used to decide the acceptability of any development proposals.

### *Policy N3PO: Local Nature Recovery Networks*

The Council will support the identification and implementation of Local Nature Recovery Networks that extend beyond the Boroughs boundaries and provide important linkages for wildlife within Copeland and beyond.

Development which protects or enhances nature recovery networks will be supported in principle.

### *Policy N6PO: 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 Head 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 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.

#### *Policy N7PO: Green Wedges*

The Local Plan Proposals Map identifies Green Wedges within the Borough. Development will only be permitted within a Green Wedge in the following circumstances unless the economic, environmental or social benefits of the proposal significantly and demonstrably outweigh any harm:

- where the open character of the Green Wedge and separation between settlements is maintained; and
- where the special characteristics and quality of the landscape are conserved and enhanced.

#### *Policy N8PO: Protected Green Spaces*

The Local Plan Proposals Map identifies Protected Green spaces which are of a high quality and/or value.

Development proposals that enhance Protected Green Spaces will be supported in principle.

The loss of such Protected Green Spaces will be resisted unless equivalent replacement provision of the same or better quality is provided within the same settlement.

Proposals to develop other green spaces, including play areas and allotments not identified on the Proposals Map, should also comply with this policy where there is evidence that they are of value to the community.

#### *Policy N9PO: Local Green Spaces*

The Local Plan Proposals Map identifies important Local Green Spaces. Development will only be permitted within a Local Green Space in the following circumstances, where the open character of the Space and its community value is not compromised:

- Proposals which improve access to/from and within the LGS, or
- Proposals which provide opportunities for outdoor sport and recreation, or
- Proposals which allow a wider range of uses to take place within the LGS, or
- Proposals which enhance landscapes and visual amenity, or

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- Proposals which provide/enhance habitats.

Development on sites adjacent to Local Green Spaces should provide an attractive frontage, natural surveillance and strong pedestrian connections to the LGS.

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