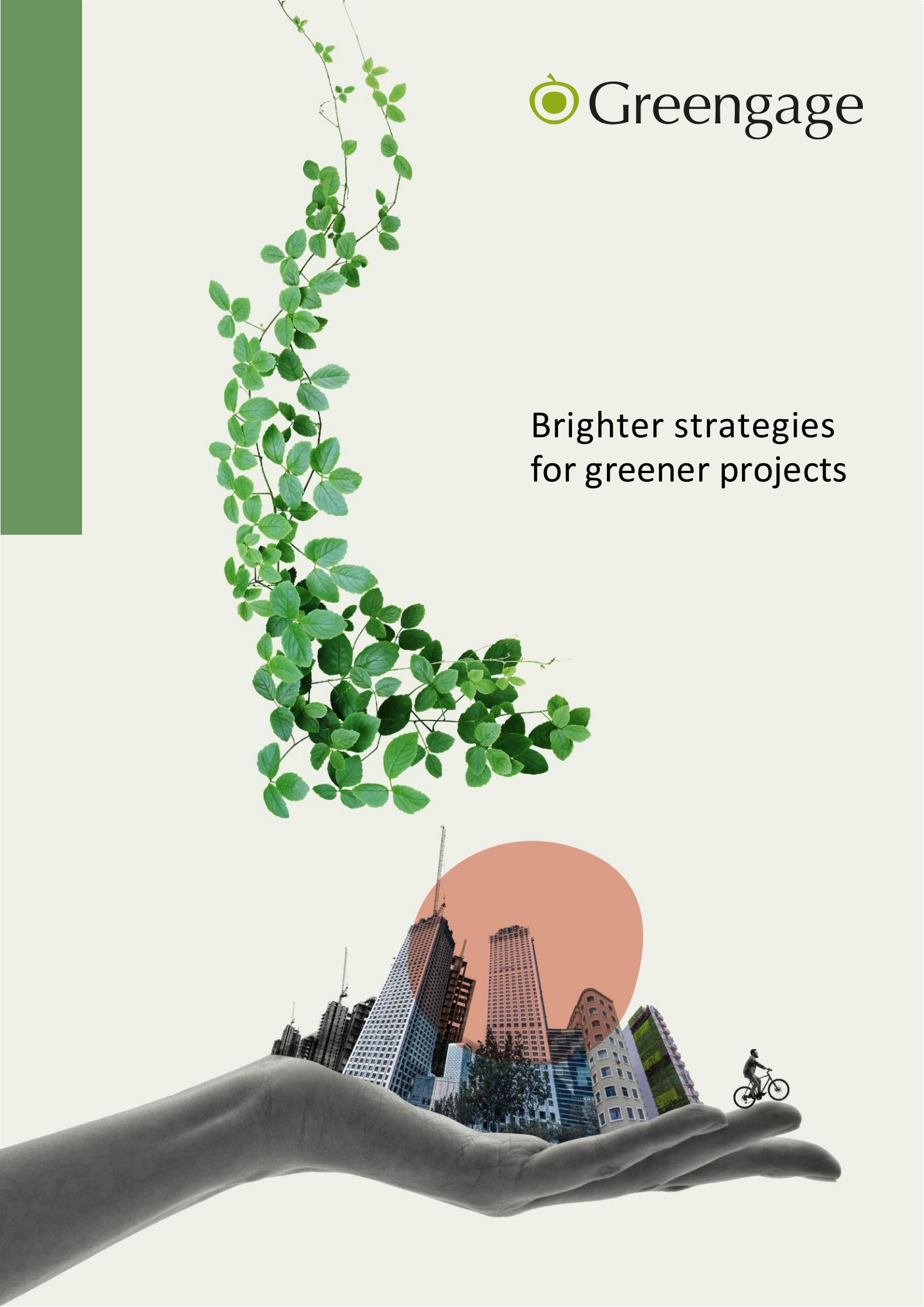




Brighter strategies
for greener projects



Client: Cumberland Council
Project: Iron Line
Report: Amphibian Mitigation and Management Plan

QUALITY ASSURANCE

Issue/Revision:	Draft	Final	Final	Final
Date:	December 2025	February 2026	March 2026	May 2026
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Prepared by:	Laura Thomas	Laura Thomas	Laura Thomas	Laura Thomas
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File Reference:	551959lt13May6FV06_Amphibi anPlan.docx	551959lt13May6FV06_Amphibi anPlan.docx	551959lt13May6FV06_Amphibi anPlan.docx	51959lt13May6FV06_Amphibia nPlan.docx

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1.0 INTRODUCTION

Greengage Environmental Limited (Greengage) was commissioned by Cumberland Council to produce an Amphibian Mitigation and Management Plan relating to Hodbarrow Nature Reserve referred to as 'the nature reserve') and a parcel of land immediately north of the nature reserve proposed for development as a Visitor Centre and car park, located on the south-west coast of Cumbria. For the purpose of this report the 'site' refers to the nature reserve and the land proposed for the Visitor Centre and car park but the 'planning application boundary' does not include the Hodbarrow Lagoon within the nature reserve as shown on Appendix A, Figure A.1.

(application ref. 4/25/2198/OF1) for the *"Erection of visitor centre with café/shop, group room, staff/volunteer, toilet facilities and car park; consolidation, repair and installation of interpretive sculpture to Towsey Hole windmill; refurbishment of existing tern hide; new bird hides/viewing screens, pathways, gateway features, street furniture and demarcation of spaces at existing car park; enhancement of wildlife habitats; associated landscaping and drainage infrastructure; and maintenance of byway ["Byway Open to All Traffic" BOAT] with restricted vehicular access (hereafter referred to as "the Iron Line project")"*.

This Amphibian Mitigation and Management Plan has been produced to discharge planning condition 8 which states the following:

"Prior to the commencement of development, a finalised Amphibian Mitigation and Management Plan (AMMP) must be submitted to and approved in writing by the Local Planning Authority. The AMMP must include the following:

- *Enhancement for natterjack toads including fencing around pools, restricted vehicle access, formalisation of paths, signage and increased refugia;*
- *Full details, including timescales for development and management details, of the proposed five natterjack toad/greater crested newt hibernacula.*
- *The development must be completed in accordance with the approved details and must be retained for the lifetime of the development.*

Reason

To protect the ecological interests evident on the site in accordance with Policy N1PU and N3PU of the Copeland Local Plan 2021 – 2039."

This Amphibian Mitigation and Management Plan covers the construction and operational stages of the site and should be read in conjunction with the Landscape and Ecological Management Plan (LEMP)¹ which details wider habitat creation and management.

1.1 SITE CONTEXT

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

The nature reserve is part of the Morecambe Bay and Duddon Estuary Special Protection Area (SPA), Morecambe Special Area of Conservation (SAC), Duddon Estuary Ramsar site and the Duddon Estuary Site of Special Scientific Interest (SSSI).

The Ramsar citation notes that the Duddon Estuary supports nationally important numbers of the rare natterjack toad *Epidalea calamita* near the north-western edge of its range (an estimated 18-24% of the British population).

The SSSI citation also notes the following:

"The natterjack toad is a nationally rare species in Britain and over 95% of the population is associated with five estuaries, the Alt, Ribble, Duddon, Esk and Solway. The Duddon Estuary itself is therefore one of the most important areas in Britain for this species and contains between 18–25% of the U.K population, which in turn is equivalent to 50% of the Cumbrian natterjack toad population. The toads breed in ephemeral ponds 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."

2.0 ECOLOGICAL BACKGROUND

2021/2022

Tyrer Ecological Consultants Ltd undertook amphibian surveys in 2021² and 2022³. Surveys identified likely absence of natterjack toads and Great Crested Newt (GCN) *Triturus cristatus* on site. However, a confirmed natterjack breeding pond was identified approximately 400 metres (m) north-east from the planning application boundary and 570m north-east of the nearest works associated with maintenance of the Byway Open to All Traffic (BOAT). Male natterjack toads were heard calling off-site c. 20m to the east (95m north-east of the nearest works associated with the maintenance of the BOAT). The waterbodies on-site were confirmed to support common amphibians, smooth newt *Lissotriton vulgaris*, common toad *Bufo bufo* and common frog *Rana temporaria* in 2021 and 2022.

2024/2025

Since the amphibian surveys by Tyler Ecological Consultants Ltd in 2021 and 2022, the RSPB secured funding from the Natural England's Species Recovery Programme and undertook habitat management at the reserve over winter 2023 to enhance suitability for natterjack toads and create additional breeding habitat. Works included scrub clearance and the creation of new scrapes/pools.

The RSPB monitored these features in April and August 2024 using Amphibians and Reptiles Conservation (ARC) methodology⁴, and confirmed by email on 26 February 2025 that results from the 2025 monitoring programme would be shared once available. Following discussions with Natural England and the RSPB, it was agreed that updated amphibian surveys were not required at this stage. Greengage has not yet received the 2025 monitoring data.

As detailed in the Phase 2 Survey Update Addendum⁵, the RSPB's 2024 surveys recorded natterjack toad calls just off-site to the east, consistent with the 2021/2022 findings. In April 2024, approximately 5,000 unidentified tadpoles were also observed in one pond (See Appendix A for location). In July 2025, the RSPB confirmed that a spawn string recorded in May 2024 was considered likely to be natterjack toad, based on its occurrence later in the season than would typically be expected for common toad.

3.0 MITIGATION AND ENHANCEMENTS

Mitigation to be applied at the site (at the nature reserve and at the Visitor centre and car park) during the construction phase is provided below. Enhancements are provided to on the nature reserve.

3.1 CONSTRUCTION MITIGATION

Protection of Retained Habitats

Approximately 0.29 ha of scrub will be cleared to facilitate the development of land in the site proposed for the Visitor Centre and car park. Approximately 1.50 ha of scrub will be left in-situ, providing shelter for common amphibians, with grassland habitat adjacent which could provide suitable foraging habitat for both common amphibians and natterjack toads. Both retained scrub and grassland will be protected during the works through signage and/or fencing.

Scrub clearance method statement

All scrub and habitat clearance will be undertaken under the presence of an Ecological Clerk of Works (ECoW).

Toolbox Talk

A toolbox talk will be given by the Ecological Clerk of Works (ECoW) to all operatives prior to the commencement of site activities. The toolbox talk will include identification of target species and outline legislation pertaining to natterjack toads and other amphibians including GCN and actions if any are encountered.

Timing of Works

All vegetation clearance and topsoil stripping should be undertaken between April and mid-October, when overnight temperatures are regularly above 5°C, and to coincide with the active amphibian and reptile season. This will avoid the hibernation season (late October/November to March).

Precautionary Clearance

Site scrub clearance of suitable amphibian habitat will follow a reasonable avoidance method in the form of a two-stage cut and will be supervised by an ECoW to check for and minimise any harm to amphibians.

The precautionary staged clearance will be undertaken during the active period for amphibians (April and October) and when air temperatures are between 9°C and 20°C, to ensure they have the best chances to escape and find refuge in suitable habitat should they be disturbed. Scrub clearance carried out during April to August will require ECoW attendance to confirm the absence of nesting birds, therefore, clearance will preferentially take place during September and October.

During the first stage vegetation should be cut to no lower than 150mm directionally towards neighbouring suitable habitat which will be decided by the ECoW and left for at least 24 hours.

During the second stage, the works area will be subject to fingertip search or raked by hand, under supervision of the ECoW, to ensure amphibians are not injured or killed. Any animals encountered

will be moved by the ECoW to an area of suitable habitat marked for retention. Once the works area is deemed free of amphibians and other protected or notable species, it should be cleared to ground level and kept clear of vegetation so that it remains unsuitable for amphibians.

Any refugia including log, rubble piles should be dismantled by hand under supervision of the ECoW.

This precautionary clearance will also protect other species, including reptiles and hedgehogs, during the works.

Works to the paths and boat

RSPB have provided the following map in January 2026 of terrestrial habitat made suitable for natterjack toads. The majority of works taking place within these areas will be along the existing paths and the BOAT. Where limited vegetation clearance is required (taking place in dense scrub and on existing desire lines) these will follow a precautionary method of works.

Figure 3.1 Terrestrial habitat and connectivity



Image 1: Likely Natterjack Terrestrial Habitats on RSPB Hodbarrow Reserve

Works to resurface existing footpaths and the maintenance to the BOAT will encroach within approximately 10m of three of the existing natterjack toad scrapes/pool habitat (see the Biodiversity Protection Zones relating to natterjack toads in Figure 3.1). It is estimated that the works within these BPZs will take approximately one week.

Figure 3.2 10m BPZ relating to Natterjack toad habitat in the nature reserve



General best practice during construction

Pollution Control

Given the temporary and small-scale nature of the works proposed within the BPZ, the risk of contaminated runoff affecting the use of nearby pools by natterjack toads is considered low. Nevertheless, to ensure protection of these habitats throughout construction, the following pollution mitigation measures will be implemented.

Air Quality, Dust and Emissions Management

The air quality, dust and emissions management detailed in the Construction Ecological Management Plan (CEcMP)⁶ Table 2.2 and materials and waste management detailed in Table 2.3 will be adhered to mitigation pollution events reducing the water quality of the suitable natterjack toad scrapes/pools.

Materials and Storage

Where possible all materials (including timber, bricks, stone, loose substrate) will be stored off the ground, such as on pallets, or in secure containers and on areas of existing hardstanding. All material should be compressed and sealed with the back of a bucket, making the spoil heaps solid and without gaps that amphibians could burrow into.

Lighting

Construction works will predominantly be undertaken during daylight hours to avoid impacts on nocturnal wildlife such as natterjack toads. Where night time working is required, for example during the late autumn, winter, any artificial lighting used will follow actions detailed in Table 2.5 of the CEcMP which was informed by the the Bat Conservation Trust (BCT) and Institute of Lighting Professionals (ILP) guidelines⁷. Task lighting will be directional, use hoods and shields to avoid light spill onto surrounding habitats such as the lagoon, pools/scrapes, grasslands or sand dunes, achieved through directional lighting and the use of use hoods and shields. The lighting will be switched off when not in use.

Emergency Measures

Natterjack Toad

The ECoW will be present during all habitat clearance works. Additionally, it is understood that there are on-going monitoring surveys for natterjack toads by RSPB who are yet to confirm presence of adult individuals following the Natural England's Species Recovery Programme enhancements on the nature reserve. If adult natterjack toads are confirmed, either during the works or through these surveys, any works with the potential to impact the species will be postponed, and a Natural England licence will be required before such works can continue. Obtaining this licence may require additional seasonal surveys. Once a licence is in place, works affecting suitable habitat will likely need to be undertaken under the supervision of natterjack toad licensed ecologist.

If a natterjack toad is encountered at any time during site preparation or construction, or within the vicinity of the works area or spoil storage area, it must be left in situ and all works in that area must halt immediately. The Biodiversity Champion nominated by Storys Contracting Ltd as per their CEMP, will notify the ECoW, who will advise on the appropriate course of action.

GCN

There are no recent records of GCN within 2km of the site. However, in the unlikely event that GCN are identified during works, all relevant works (within dense scrub habitat) must cease immediately. Further surveys and a Natural England licence are likely to be required before any vegetation clearance or related works can recommence. Once a licence is in place, works affecting suitable habitat will likely need to be undertaken under the supervision of GCN licensed ecologist.

3.2 OPERATIONAL MITIGATION

Installation of Dog-proof Fencing

Proposals seek to fence with dog-proof fencing of existing scrapes/pools, where there is currently no fencing or none planned, which will reduce disturbance from humans and dogs and prevent the leaching of dog flea treatments into the water.

The dog-proof fencing surrounding the scrapes/pools will be locked to prevent visitor access and will allow sufficient space for RSPB maintenance machinery, ensuring the scrub can be managed in order to retain the habitat suitability for natterjacks.

Cumberland Council will liaise with RSPB on the location, specification of the fencing type and design. See Appendix C for proposed locations of new fencing subject to agreement with RSPB.

Signage

Additional signage will be installed across the site to inform visitors and reduce disturbance. Research shows that clear, well-designed signage can effectively influence visitor behaviour, particularly on sites with limited active management⁸

Interpretation boards will explain the local presence of natterjack toads, their sensitivity to disturbance, and the need to keep dogs on leads and avoid key habitat areas. Modern, engaging graphics will help raise awareness and promote understanding of the species and its conservation needs.

Plate 3.1 Examples of interpretation boards



Gully Ladders

Seven grill covered drainage gullies will be located within the car park (see Appendix E for locations of gullies requiring ladders), to facilitate the removal of surface water from this area. The gullies are located on hardstanding around the visitor centre, separated from suitable terrestrial habitat by the boundary wall and/or car park hardstanding and are not along known amphibian migration routes. As such, the likelihood of amphibians being present is extremely low, however, the gullies ladders have been considered as a precaution in the unlikely event that an amphibian does move across the car park.

To ensure amphibians which may accidentally fall into any gully are able to exit, gully ladders will be installed to allow them to escape safely. The gully ladders must match the full length of the gully to ensure effective egress.

Figure 3.3 Example of a suitable gully ladder product advertised on the British Herpetological Society website



3.3 ENHANCEMENTS

Creation of Hibernacula

At least five natterjack toad hibernacula will be created within the nature reserve. Locations will be agreed with the RSPB and should be positioned near the existing scrapes/pools, avoiding priority and Annex I habitats (see Appendix C). The hibernacula should be created in accordance with the ARC methodology set out in Appendix D.

If no suitable locations are available, limited scrub clearance may be required with RSPB approval and SSSI consent from Natural England.

Site selection requirements:

- Free-draining, sandy or loose soils.
- Ideally on banks on areas not prone to flooding or shading.
- Groundwater conditions suitable for maintaining natural soil moisture (as supported by Soilscales and flood risk mapping).

Ground preparation:

- Scrape back turf or compacted topsoil (approx. 30 cm) until slightly damp mineral soil is exposed.
- Ensure underlying soil retains natural moisture and capillary structure.

Hibernacula construction:

- Create hibernacula in accordance with the ARC Hibernacula Creation Guidance located in Appendix D using clean brick and rubble and loosely filled in with looser substrate such as site-won light soil or sand.
- The bank profile will create stable cavities, act as windbreaks and help retain sand.

- Avoid using loose sand piles on the surface, as natterjack toads do not use these for hibernation.

These features will replicate conditions known to support natterjack hibernation, informed by existing habitat examples (e.g., stone walls, slag heaps, dune systems) and expert guidance.

Timescales for creation

The creation of the hibernacula will follow the breaking up of the concrete layby adjacent to the visitor centre as this will be used in the creation of the hibernacula. The hibernacula will ideally be created by early Autumn (late September/early October) in 2026 or 2027 to provide opportunities in the future for natterjack toads to hibernate.

Public engagement opportunities

The Visitor Centre will provide strong messaging on the reserve's significance and sensitivity, using education and volunteering opportunities to raise public awareness of its delicate ecology and promote species and habitat conservation. It will offer information on the local natterjack toad population, including their ecology and identification, helping visitors develop a deeper understanding of the amphibians present. Improved welfare facilities will also make volunteering more accessible, supporting ongoing site management and habitat monitoring.

The future operator will engage regularly with the RSPB to align messaging and ensure a clear understanding of the reserve's conservation objectives.

4.0 OPERATIONAL MANAGEMENT

4.1 MANAGEMENT ACTIONS

Gully ladders

The gully ladders will be checked once a week for the first six weeks following installation to confirm proper installation. Following which they will be checked and maintained during the routine monthly drainage channels and gullies maintenance, as per the SuDS Operation & Maintenance Manual⁹.

In the event that a natterjack toad is found during the gully checks, Natural England must be contacted for further advice. A licenced natterjack toad ecologist must be contacted too who can safely move the natterjack to a place of suitable refuge. Dependent on Natural England's advice, a European Protected Species (EPS) licence may be required for works to proceed. Any revised monitoring of the gully's or mitigation measures as specified by Natural England will be addressed in an updated AMMP.

Dog-proof fencing

There will be an agreement in place between Cumberland Council and RSPB as to who will be responsible for checking and maintaining the dog-proof fencing. The frequency of checks will be agreed with RSPB, Cumberland Council and the future operator of the Visitor Centre and carpark.

The future operator will adhere to an agreed minimum commitment of staff presence on the nature reserve which will include maintenance reporting to be agreed with RSPB. The frequency of the maintenance checks will vary depending on the season, reports of damage, and likelihood of damage e.g. following extreme weather events.

Hibernacula

If loose soil has become compacted, the hibernacula will require topping up looser materials such as sand, soil infill. An annual check in late summer/early autumn will be carried out to ensure cavities remain functional. Any management actions required ideally will be undertaken ahead of the hibernation season.

It is Cumberland Council's preference that RSPB undertake the minimal management required for this habitat which can be undertaken at the same time as their existing management regime of the adjacent pool/scrapes. This will be discussed with RSPB.

Scrub encroachment around natterjack toad scrapes/pools

Scrub encroachment around the existing scrapes/pools will continue to be managed by RSPB as this forms part of the Natural England's Species Recovery Programme management.

4.2 ECOLOGICAL CONSTRAINTS TO MANAGEMENT

No maintenance to the hibernacula will be carried during the hibernation season (November-March).

4.3 FUNDING AND RESPONSIBILITIES

Procurement for operation of the Visitor Centre and car park has not yet taken place. In the absence of an operator, a Heads of Terms agreement will be in place between RSPB and Cumberland Council which sets out the option that the Council will take responsibility to repair and maintain all infrastructure put in place as part of the Iron Line project or provide a commuted sum to RSPB for them to maintain.

4.4 TIMESCALES

The management described in this chapter will begin as soon as the works have been completed and will be ongoing maintenance reporting for the duration of the Iron line project to ensure the ongoing success of the fencing, signage and targeted enhancement features.

APPENDIX A PLANNING APPLICATION BOUNDARY AND EXISTING PONDS

IRON LINE

-  Planning Application Boundary
- Suitable natterjack toad habitat
-  Pools with unidentified tadpoles (presumed natterjack toads)
-  Other pools surveyed
-  10m BPZ for natterjack toads



Title: Figure A1
Sources: Google Maps

APPENDIX B RELEVANT LEGISLATION

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.

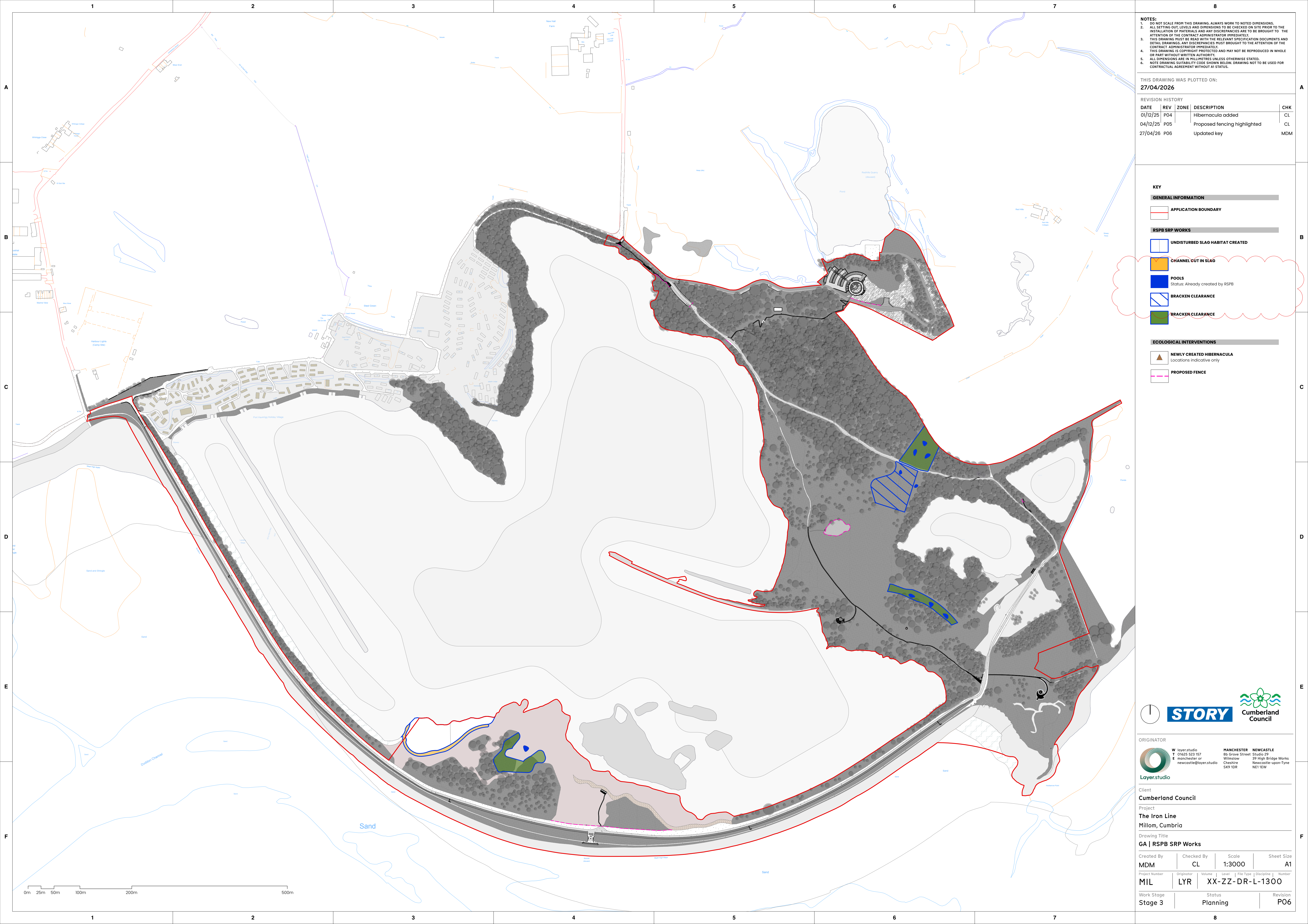
Legislation Relating to Natura 2000 Sites and Habitats Directive Annex I/II Species

European Commission Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora ('EU Habitats Directive'), and Council Directive 79/409/EEC on the Conservation of Wild Birds ('Birds Directive') form the cornerstones of nature conservation legislation across EU member states. Priority species requiring protection across Europe are listed in the Annexes of these Directives. Regulation 63(1) of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 and Offshore Marine Conservation Regulations, 2007 (as amended) transpose these directives into UK law and set the basis for the designations of protected sites (known as Natura 2000 sites; Special Areas of Conservation under the Habitat Directive and Special Areas of Protection under the Birds Directive) that are of importance for habitats, species or assemblages listed on the directive Annexes. In the UK Ramsar sites are also offered the same level of protection as SPAs and SACs however the Qualifying species for the designation may differ; Ramsar sites being designated specifically as important wetland habitats.

Under article 6(3) of the Habitats Directive, where projects stand to have likely significant effect (in accordance with the European Court of Justice ruling of C-127/02 Waddenzee cockle fishing) upon the integrity of conservation objectives (i.e. conservation status of the Qualifying species or habitats) within the designated sites then the Competent Authority must undertake an Appropriate Assessment.

APPENDIX C SUITABLE LOCATIONS FOR HIBERNACULA

Figure C.1 Layer Studios drawing showing hibernacula



- NOTES:
- DO NOT SCALE FROM THIS DRAWING. ALWAYS WORK TO NOTED DIMENSIONS.
 - ALL SETTING-OUT LEVELS AND DIMENSIONS TO BE CHECKED ON SITE PRIOR TO THE INSTALLATION OF MATERIALS AND ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE CONTRACT ADMINISTRATOR IMMEDIATELY.
 - THIS DRAWING MUST BE READ WITH THE RELEVANT SPECIFICATION DOCUMENTS AND DETAIL DRAWINGS. ANY DISCREPANCIES MUST BE BROUGHT TO THE ATTENTION OF THE CONTRACT ADMINISTRATOR IMMEDIATELY.
 - THIS DRAWING IS COPYRIGHT PROTECTED AND MAY NOT BE REPRODUCED IN WHOLE OR PART WITHOUT WRITTEN AUTHORITY.
 - ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
 - NOTE DRAWING SUSTAINABILITY CODE SHOWN BELOW. DRAWING NOT TO BE USED FOR CONTRACTUAL AGREEMENT WITHOUT A1 STATUS.

THIS DRAWING WAS PLOTTED ON:
27/04/2026

REVISION HISTORY				
DATE	REV	ZONE	DESCRIPTION	CHK
01/12/25	P04		Hibernacula added	CL
04/12/25	P05		Proposed fencing highlighted	CL
27/04/26	P06		Updated key	MDM

KEY

GENERAL INFORMATION

APPLICATION BOUNDARY

RSPB SRP WORKS

UNDISTURBED SLAG HABITAT CREATED

CHANNEL CUT IN SLAG

POOLS

Status: Already created by RSPB

BRACKEN CLEARANCE

BRACKEN CLEARANCE

ECOLOGICAL INTERVENTIONS

NEWLY CREATED HIBERNACULA

Locations indicative only

PROPOSED FENCE



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W layer.studio
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newcastle@layer.studio

MANCHESTER NEWCASTLE
80 Grove Street Studio 29
Willeslow Cheshire
SK9 1DR NE1 1EW

Layer.studio

Client
Cumberland Council

Project
The Iron Line
Millom, Cumbria

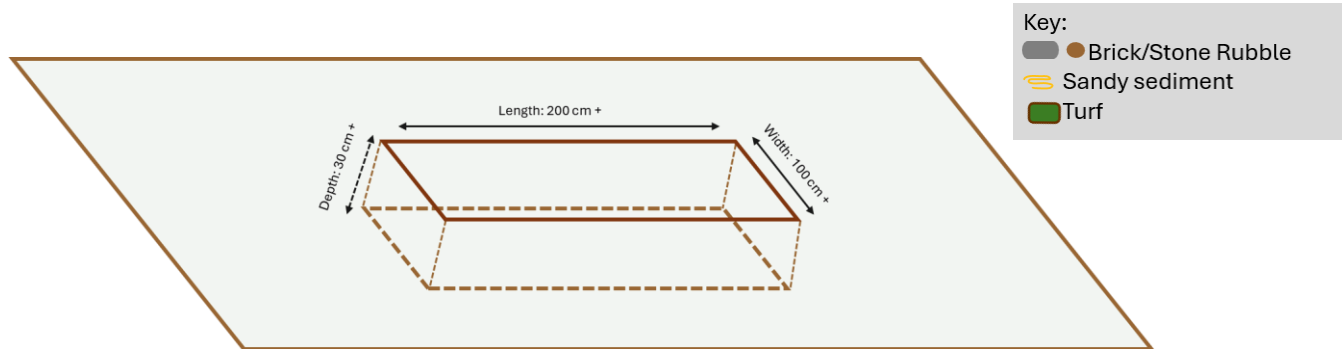
Drawing Title
GA | RSPB SRP Works

Created By MDM	Checked By CL	Scale 1:3000	Sheet Size A1
Project Number MIL	Originator LYR	Level XX-ZZ-DR-L-1300	Number
Work Stage Stage 3	Status Planning	Status	Revision P06

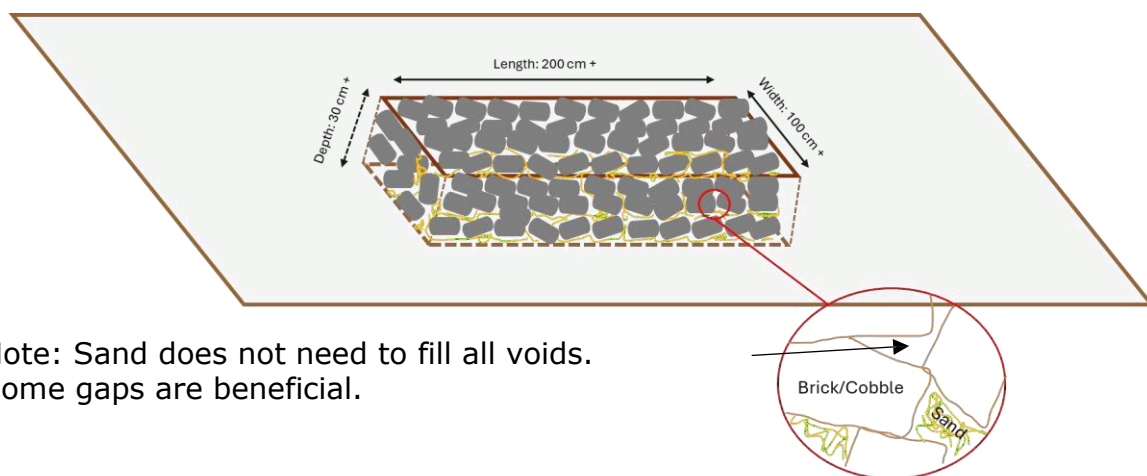
APPENDIX D ARC HIBERNACULA CREATION

Appendix A – ARC Hibernacula Creation Guidance

Creation of natterjack toad hibernacula within an existing slope/bank (ARC 2026)

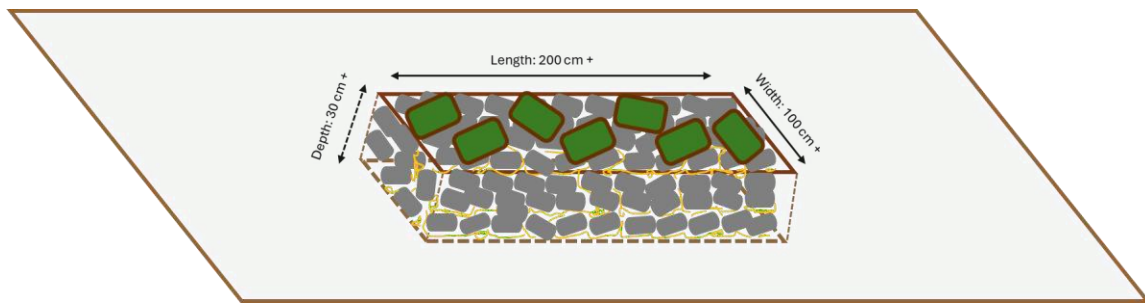


Using a 360 digger, telehandler or similar, dig the feature 30+cm into the ground, i.e. to below the depth at which the soil may freeze in winter. Retain the soil especially if it's sandy. Ideally, the length should be 200 cm + and the width 100 cm + but this can be bigger depending on the situation. Multiple features suitably created across the landscape are ideal rather than one large feature. This method is not suitable for sand dunes.

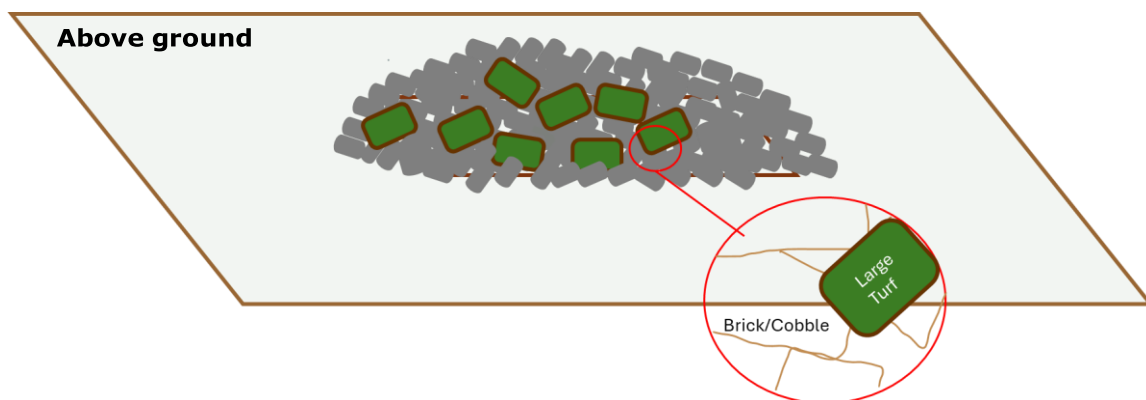


Note: Sand does not need to fill all voids. Some gaps are beneficial.

Source clean brick/cobble rubble by the cubic meter as determined by the volume of the feature dug. Irregular shapes of cobbles/bricks are ideal for leaving cavities for refuge. It may be worth breaking a portion of the bricks to create irregular shapes in some cases. A minimum volume of 1m³ of rubble should be created to ensure its value for the species. Avoid broken tiles or slates as these materials don't naturally form piles with suitable gaps for natterjack toads to utilise. Fill the hole/trench with rubble and a little of the sandy soil (if present). Do not compact the material as the natterjack toads will use the voids, moving up and down inside as conditions change.

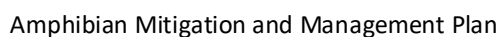


Place the retained turf on top leaving plenty of gaps at ground level and elsewhere.



Continue to add rubble, turf and a little sand/soil to form a rounded mound at least as big as the part below the ground. Turfs on the surface must be large enough to ensure they don't blow away. The hibernacula must remain unshaded with the surrounding sward kept as low as possible.

Figure E.1 Gully ladder locations



REFERENCES

- ¹ Greengage Environmental (2025) *Landscape and Ecological Management Plan* (ref: 551959lt05Dec25FV01_LEMP)
- ² Tyler Ecological Consultants (2021) *Presence/Absence surveys for Natterjack toad & Great crested newt (GCN) - Phase 1* (ref: RSPB Hodbarrow - Natterjack Toad & GCN_2021_v1.1)
- ³ Tyler Ecological Consultants (2022) *Natterjack toad (Epidalea calamita) surveys - 2022* (ref: RSPB Hodbarrow - Natterjack Toad 2022 (Final))
- ⁴ Yvette Martin, Karen Haysom, Mandy Cartwright and John Buckley (2021) *Guidance for monitoring natterjack toad populations in the United Kingdom*
- ⁵ Greengage Environmental (2025) *Phase 2 Addendum* (ref: 551959lt05Dec25FV02_Phase2Addendum)
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- ⁷ Institution of Lighting Professionals and Bat Conservation Trust (2023), *Bats and Artificial Lighting in the UK; Bats and the Built Environment Series*
- ⁸ Allbrook DL, Quinn JL. The effectiveness of regulatory signs in controlling human behaviour and Northern gannet (*Morus bassanus*) disturbance during breeding: an experimental test. *J Nat Conserv.* 2020 Dec;58:125915. doi: 10.1016/j.jnc.2020.125915. Epub 2020 Oct 9. PMID: 33071716; PMCID: PMC7546240
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