

ALUCO ECOLOGY LTD

LAND AT BONHAMS, YAPTON
REPTILE MITIGATION STRATEGY

SEPTEMBER 2019

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LAND AT BONHAMS, YAPTON ECOLOGY MITIGATION STRATEGY

SEPTEMBER 2019

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LAND AT BONHAMS, YAPTON ECOLOGY MITIGATION STRATEGY

SEPTEMBER 2019

1.0 INTRODUCTION

1.1 Background

1.1.1 The site has Outline Planning Permission ‘with some matters reserved for the erection of 56 No. dwellings and associated open space and creation of new access.’ A detailed ecological assessment was provided with the Outline Application (see Aluco Ecology, 2016).

1.1.2 The planning permission contains a condition directly related to the site’s ecology (as well as other areas which may affect ecology indirectly):

7 Prior to the commencement of development or any preparatory works, an Ecological Enhancement and Management Scheme shall be submitted to the Local Planning Authority for approval and is to be based on the recommendations within the supporting Ecological Assessment dated November 2016, as appropriate. All approved details shall then be implemented in full in accordance with the agreed timings and details.

Reason: To protect and retain the biodiversity value of the site, in particular the perimeter hedgerows and trees before any works commence on site in accordance with policy GEN29 of the Arun District Local Plan.

1.1.3 A strategy has been produced for this (see Aluco Ecology, 2019 & Terra Firma, 2019). In addition a detailed reptile strategy has been requested. This is set out in Aluco Ecology, 2019 and further set out below.

1.1.4 A detailed scheme for the site has been developed, and this is reproduced at **Figure 1** below.

1.2 Previous Survey Work

Summary of Previous Survey

1.2.1 A number of species are protected under legislation and policy; namely the Conservation of Habitats & Species Regulations 2010 in relation to the European protected species (eg bats, dormouse, great crested newts) and the Wildlife & Countryside Act 1981 (as amended) and Countryside & Rights of Way Act (CROW) 2000 for protected species and the designation and protection of SSSIs (**Technical Appendix 1**). The Protection of Badgers Act 1992 gives protection to Badgers *Meles meles*.

- 1.2.2 Aluco Ecology has undertaken reptile survey work on the site (see Aluco Ecology 2016). Populations of a single species of reptile, Slow Worm *Anguis fragilis*, in low numbers has been recorded on site. The distribution of reptiles is provided at **Figure 2** below (re-produced from the original survey, Aluco Ecology, 2016).

2019 Walkover Survey Update

- 1.2.3 Survey work has been updated in spring 2019 to cover all species groups with walkover updates to inspect potential for changes in habitats.
- 1.2.4 An updated protected species search with the Sussex Biodiversity Records Centre has also been undertaken. No additional protected species/European Protected Species records have been provided from the previous 2016 survey work, which would have an impact on the site and mitigation recommendations, as set out in the Outline Permission ecology assessment.
- 1.2.5 The habitats on site are broadly similar to those from the previous survey work (Aluco Ecology, 2016). There have been no significant changes in management of the grasslands on site. Overall the habitats for ecology features outlined in the original assessment remain similar and these assessments remain valid. Updated annotated photos for the walkover survey are provided at **Technical Appendix 2**.

2.0 DETAILS OF DEVELOPMENT

2.1 Introduction

- 2.1.1 This method statement details mitigation for works relating to the Reserved Matters phases of the development. **Figure 1** shows the detailed Masterplan.

2.2 Biophysical Changes associated with the Development Scheme

Pre-Construction Site Clearance

- 2.2.1 Existing vegetation within the construction zone will be required to be removed and the ground re-profiled within the development area.

Construction

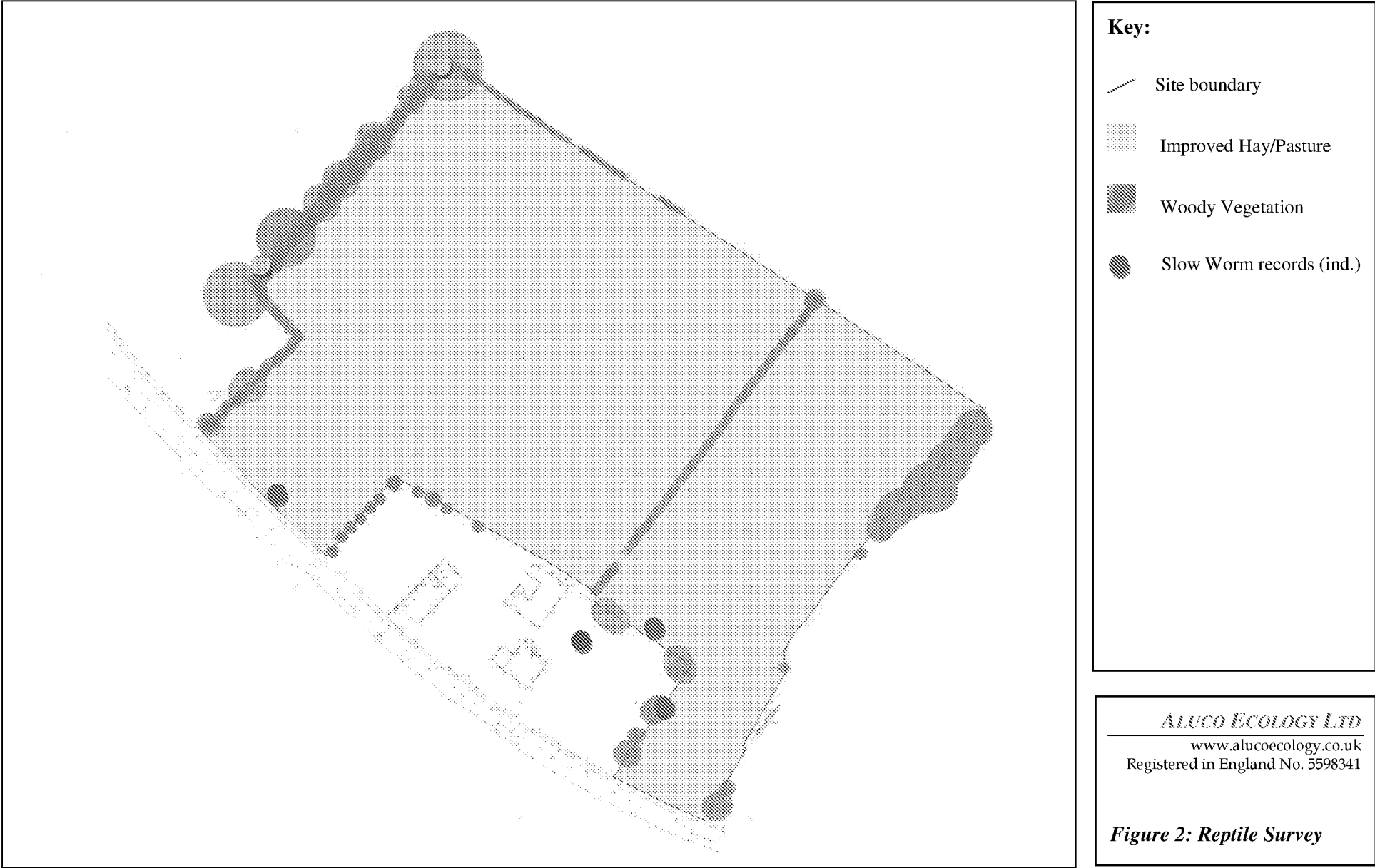
- 2.2.2 The construction of the development has the potential to affect protected species and ecological features, some of which are afforded protection under the legislation and policy outlined in Section 1 above. The following sections provide details for each relevant protected species group, to ensure that pre-construction works follows best practice and protected species are taken into account.

- 2.2.3 A detailed Landscape Strategy has been prepared for the site (see Terra Firma 2019). This provides for formal and informal habitat creation and landscaping both around the main development footprint and new public open space habitats south of the main development area. This has been informed by the ecology mitigation and prescriptions.

Operation

- 2.2.4 The retained public open space areas of the site are designed to fulfil a multi-purpose role of biodiversity gain, landscaping and public open space. Additional planting has been provided in the Landscape Plan (Terra Firma, 2019).





3.0 MITIGATION METHOD STATEMENT: REPTILES

3.1 Introduction

3.1.1 All reptiles are protected under the Wildlife & Countryside Act 1981 (as amended) (see Technical Appendix 1). The following strategy has been devised in order to follow best practice guidance (HGBI, 1998, Froglife, 1999).

3.1.2 Survey work has recorded a relatively low population of Slow Worm on site, primarily around the southern boundary of the two fields, but with all field boundaries containing small amounts of suitable edge habitat for reptiles.

3.2 Potential Risks

3.2.1 The construction of this phase of the development has the potential to provide the following risks to reptiles:

- Direct damage to reptiles through construction activities such as tracking of machines and damage to habitat;
- Damage to habitats associated with retained hedges and trees, including rough grassland edges and ditches within hedgerows through construction activities such as tracking of machines and damage to habitat;
- Potential Indirect Impacts on retained habitats.

7.2.2 The following sections below provide detailed mitigation for ensuring that reptiles & amphibians on site are protected during the construction phase and that risks outlined above are addressed through the process to provide suitable avoidance, reduction and offsetting measures and safe biodiversity protection zones.

3.3 Mitigation Strategy

3.3.1 A local translocation strategy is required to ensure that the development does not harm reptiles/amphibians. The following strategy was set out as part of the Outline Planning Permission, and is developed in detail here to ensure that reptiles are protected in the long term.

- The main aim is to retain reptile populations within the local area, and within retained habitat on the site, including public open space area;
- In the short term this will require a local translocation of reptiles from the construction area to retained areas;
- Retained areas will be enhanced through provision of new reptile habitat in long term management of open space habitats;
- The public open space is shown on landscape plans, reproduced as **Figure 3**;

- Prior to construction commencing, phases of the construction zone will be subject to translocation and a destructive search to the methods set out below and in **Technical Appendix 3**, to ensure that reptiles are not harmed;

3.4 Translocation Methodology

3.4.1 The construction zone is highlighted in **Figure 4** below. The translocation will be undertaken according to the following strategy:

- The existing hay meadow area should be cut short regularly to ensure that the construction zone is retained as short grassland;
- The areas of edge habitat within the construction zone of the site will be sensitively strimmed to c10cm using hand tools, careful not to harm reptiles potentially present; Where trees and bushes are also to be removed, due regard will be given to the mitigation strategy for nesting birds and other mammals;
- At present it is assumed that with appropriate timing and management of construction zones to ensure reptile habitats are removed and do not re-develop, reptile protective fencing is not considered to be effective/needed along retained boundary areas. This can however be reviewed during construction;
- Refugia will be placed along the construction works area and a translocation will be made based on the methodology outlined in **Technical Appendix 3**;
- Reptiles and any amphibians will be translocated to the retained habitat in public open space away from the construction zone (see **Figure 4**);
- Following 3-5 negative visits in suitable conditions a destructive search will be undertaken of the works area by a suitably qualified ecologist;
- Where necessary site Heras/reptile fencing will continue to provide protection of the retained habitat around the edge of the development area, from construction intrusion;
- Long term management proposals of all retained habitat are provided in a management plan (Terra Firma, 2019);
- The reptile strategy will be undertaken outside of the hibernation period and during April-October, depending upon weather conditions and other factors. Where potential reptile habitat is contained within the works area outside this period, no construction works will be undertaken in this habitat during this period.
- The reptile strategy will be detailed to conform to any mitigation requirements for other protected species.

3.5 Retained & Created Habitats – Public Open Space

Introduction

3.5.1 New habitats comprising extended areas of tall uncut grassland edge will be allowed to develop from existing grasslands in the public open space part of the site, which is where

the existing population of Slow Worm were recorded. The habitats to be created and managed within the public open space will be subject to a management & maintenance plan and detailed landscape planting plans (with ecology management recommendations set out in Section 3 above). These are set out in the detailed Landscape Plans (Terra Firma, 2019). A summary of the landscape planting plan is provided at **Figure 3**.

- 3.5.2 Ecological mitigation has been built into the landscaping, in order to provide native retained hedgerows and boundaries, new native species woody planting, and a series of grasslands from tall grassland edge habitat that will be of suitability to reptiles and amphibians, and hay meadows sown with wildflower mixes to provide another habitat type.
- 3.5.3 Management prescriptions for reptile edge tall grassland and other habitats is designed to ensure that ongoing management of public open space has regard to reptiles present within the site. These are summarised below.

Retained Vegetation – Protection Areas

- 3.3.1 The boundary hedgerows and additional grassland edge vegetation are to be retained as part of the scheme. These boundaries will be marked to the edge of the works area and protective fencing to relevant building standards will be erected at the edge of the works/retained habitat areas to ensure that habitats are retained in situ during construction. The grassland edge habitat at the base of these habitats is important to reptiles and will be retained in situ as part of the reptile mitigations strategy, and protected by the site fencing.
- 3.3.2 There should be no storage of materials, or equipment, or use of the retained hedge/boundary on the site by any construction activities.

Habitat Enhancement and Creation

- 3.5.1 **Figure 1** shows the development masterplan, and detailed landscaping plans for the public open space are reproduced at **Figure 3**.
- 3.5.2 Recommendations are provided to enhance these features for wildlife and are built into the longer term management of the areas following construction. They include:
 - Existing boundary hedgerow/tree line habitats are to be retained, with the exception of a widening of the access between the two fields. Where these features are present along the edges of public open space (the south eastern edge of the central hedgerow), and where a management strip is provided at the back of gardens, the management of these habitats in the longer term will allow for a reduced cutting to provide a thick hedgerow resource of value to wildlife, with fruiting allowed during the winter period and late winter rotational management. This will be a reduced cycle of only 50% per year in the late winter;

- New tree and shrub planting is proposed within the open space areas to provide new habitats. These will comprise a number of native species shrubs and trees (see Landscape plans for details produced by Terra Firma, 2019). The management of these will be to allow for maturing then low intensity/sensitive cutting to allow fruiting and habitat to develop for wildlife, in a regime similar to the retained hedges above. Grassland edge habitat around shrubs will be allowed to develop;
- Tall uncut grassland habitats are proposed as edge habitat to woody/hedgerow creation. This habitat will be allowed to develop from existing edge grassland in retained open space areas, or created from wildflower grassland in open space areas within the construction zone. This will comprise tussocky grassland edges that can be allowed to develop with some limited woody infiltration from suckering woody species and bramble, to create a grassland edge habitat to the hedges and native species woody areas of scrub/woodland. This will be managed in the longer term through ensuring that tall grassland habitat is retained in extent through cutting of the woody encroachment;
- Semi-natural wildflower grassland is to be seeded in parts of the open space. This should be undertaken in either autumn or spring and a very hard cut with scarification of existing grassland to create bare ground areas to allow seeds to colonise. Adding Yellow Rattle *Rhinanthus minor* into the seed mix will reduce grass vigour. Yellow Rattle must be seeded in the autumn for germination. Management in the longer term will be of a hay cut (1-3 times a year depending upon growth rates – late summer, late autumn and if considered necessary, early spring) with cuttings removed. To keep a neat look at the edge of the development a c1m edge can be regularly mown along outer boundaries (eg road edges);

3.5.3 The detailed management and maintenance schedule will be set out in a Management and Maintenance Plan/Schedule. This will need to have regard to the following recommendations for ecology prescriptions (habitats are shown on **Figure 3**):

(1) Tall (uncut) Grassland Edge Habitat. Management will include annual or every second year cutting of encroaching woody vegetation (eg Bramble) to maintain an area of grasslands that are left uncut to form tussocky grassland edges. This will allow existing rough grassland habitats to develop into more complete habitats around the edges of the site, particularly the scrub habitats proposed.

Target = To retain and enhance tall grassland edge habitat to woody and other features, to provide important suitable habitats for birds, small mammals, foraging bats, reptiles, amphibians and invertebrates.

Upper Limit = Cutting of encroaching scrub either annually or every second year, to ensure a rough grassland edge is retained at the edges of the boundaries/woody habitat. Scrub encroachment (eg Brambles) can feature in this habitat type, but should not be more than 30% of area.

Lower Limit = No cutting of grasslands within designated rough grassland areas.

(2) Hay Meadow Grassland. Once established, hay meadow should be managed through cutting in the late summer/early autumn annually. Cuttings to lay on ground for 1-2 days and then collected. This should be undertaken during dry periods. A second cut can be undertaken in late autumn (Oct). Where grass growth is vigorous a further early spring cut can be taken.

Target = To manage wild flower meadows to allow flowering of herbaceous and grass species, followed by traditional hay cut maintenance to allow seeds to drop and maintain meadow habitat.

Upper Limit = Cutting up to three times annually late summer, late autumn and early spring. Cuttings should lay on ground and then be removed 1-2 days later. Compost can take place on site in compost pile, if suitable discrete location can be located. Scrub encroachment (eg Brambles) and uncut tall grassland can feature in this habitat type, but should not be more than 10% of area.

Lower Limit = Cutting of grassland once per year in late summer, cuttings to be removed as above.

(3) Woody Vegetation. Retained hedgerow and woody vegetation should be managed to allow flowering and fruiting of shrubs/trees through lower intensity cutting. For new native species planting in open space the establishment of new woody planting should ideally allow for grasses to develop at the base of the planting rather than spraying to create a natural woody habitat with associated grassland edge rather than over managed bare base. Where possible, once established, guards should be removed for natural growth.

Target = To manage all woody habitat on site (retained hedgerows/boundary vegetation, and new native planted) to flower/fruit with cutting to take place outside the bird nesting season and in late winter, with limits of cutting below taken into account..

Upper Limit = Cutting up to 50% of the resource late winter (Jan-Feb) on rotation, so that only half the resource is cut annually. Regard can be had to encroachment into formal areas to ensure that sightlines of roads is taken into account and that hedges do not encroach into private gardens.

Lower Limit = Cut every second late winter (Jan-Feb)

9.0 SUMMARY

- 9.1 A detailed reptile mitigation strategy has been devised to ensure that reptiles are protected during construction of the approved scheme and that there are long term measures to maintain and enhance the population of Slow Worms in a built scheme and during operation. A timetable of works is provided at **Table 1** below.

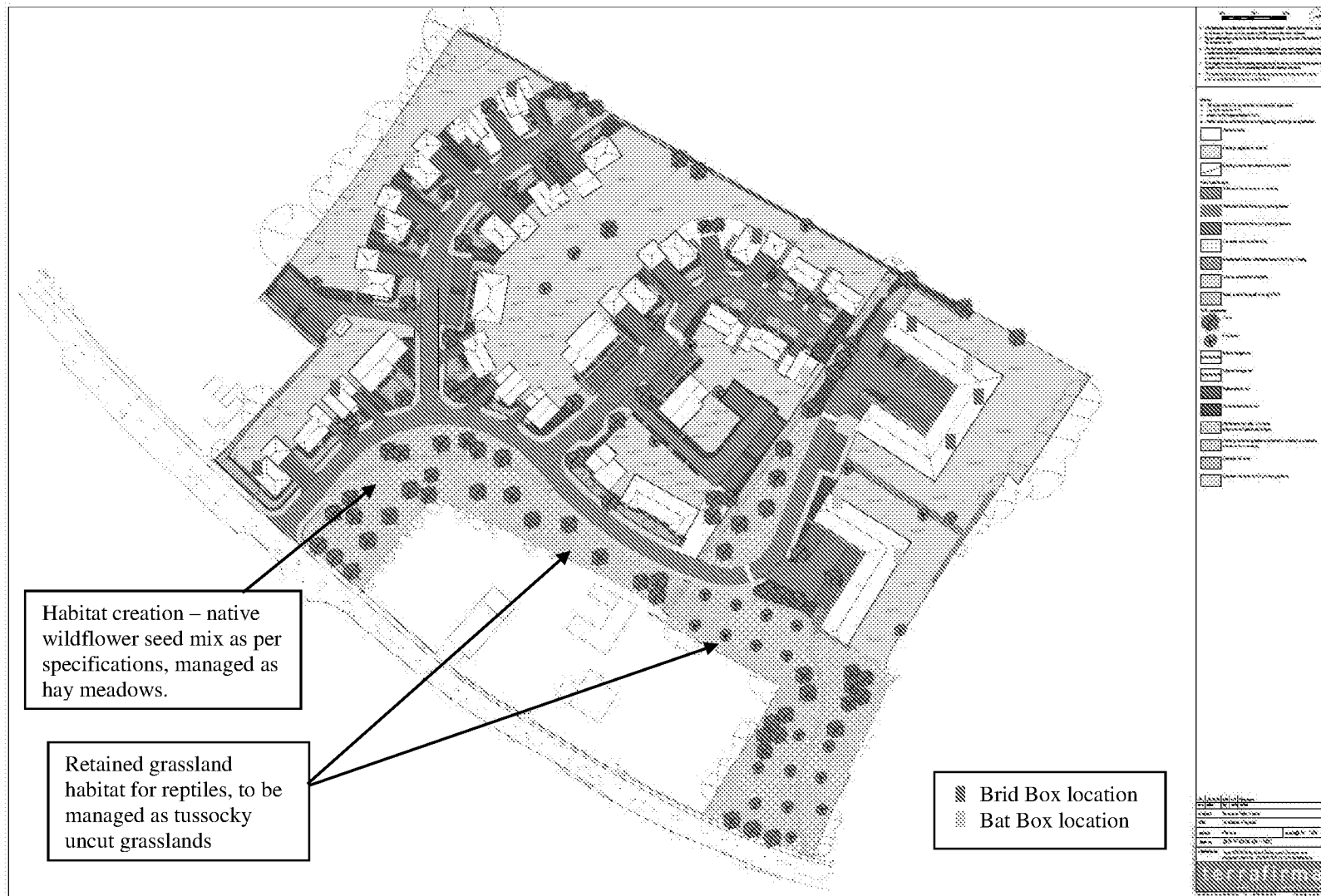


Figure 3 – Open Space Landscape Strategy: Terra Firma 2019 (with annotations)



SUMMARY TIMETABLE

A timetable showing main construction mitigation work periods for ecology is provided below at **Table 1** (but see method statements for detail).

Table 1: Summary of Anticipated Protected Species Mitigation Timescales During Construction

2019-20 =	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A
Reptiles																				
Grass cutting/manipulation																				
Monitor reptiles																				
Translocation																				
Destructive Search																				

10.0 REFERENCES

Aluco Ecology (2016) Land at Bonhams, Yapton, Ecological Assessment

Aluco Ecology (2019) Land at Bonhams, Yapton, Ecological Mitigation Strategy

Edgar, P., Foster, J. and Baker, J. (2010) Reptile Habitat Management Handbook. Amphibian and Reptile Conservation, Bournemouth

Froglife, 1999. Froglife Advice Sheet 10. Reptile Survey. An introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife, Halesworth, Suffolk.

Gov.UK (2019) Standing Advice for Protected Species and Habitats

Herpetofauna Groups of the British Isles (HGBI) Guidelines (1998) "Evaluating Local Mitigation/Translocation Programmes: Maintaining Best Practice and Lawful Standards." HGBI Advisory notes for Amphibian and Reptile Groups (ARGs). HGBI, c/o Froglife, Halesworth, personal collection.

Terra Firma (2019) Detailed Landscape Proposals 2076-TF-00-00-DR-L-1001

Technical Appendix 1
Wildlife & Countryside Act
Habitats Regulations and Schedule 2 Species
Natural Environment & Rural Communities Act 2006

WILDLIFE & COUNTRYSIDE ACT 1981 (AS AMENDED)

The Wildlife and Countryside Act 1981 (as amended) (WCA) is the principle legislation in Britain for the protection and conservation of our wildlife and its habitats of national importance. The legislation adopts a habitat and species based approach to nature conservation. Habitats and some species are protected in designated Sites of Special Scientific Interest (SSSI). Other species are afforded some protection from harm or disturbance by way of inclusion in either Section 1 (birds), Schedule 1 (specially protected birds), Schedule 5 (specially protected animals) or Schedule 8 (specially protected plants).

Protection Afforded to SSSIs

The presence of an SSSI on or near to a development is a material consideration, and this is discussed further in planning policy (see National Planning Policy Framework)

Law Relating to Protected Species

The WCA provides protection to such species in Part 1 of the Act. These sections provide protection from intentionally:

- killing, injuring or taking any wild bird or taking, damaging or destroying the nest or eggs of a wild bird
- disturbing any wild bird in Schedule 1 whilst building, on or near a nest, or disturbing dependant young of such birds
- damaging, destroying or obstructing access to any structure or place of shelter or protection of a schedule 5 animal, or disturbs any such animal whilst it is occupying a structure or place it uses for that purpose
- killing, injuring or taking any animal listed in Schedule 5
- Having in procession or control any live or dead wild bird or egg, or any wild animal in Schedule 5, or trading in any animal under Schedule 5.
- Damage to plants listed in Schedule 8 or uprooting of wild plants unless an authorised person.

Exemption and licences for development can be obtained in certain circumstances. Protected species are also a material consideration in planning applications.

Disturbance & Recklessness

The Countryside and Rights of Way Act 2000 (CRoW Act 2000) adds to protected species legislation in the WCA. The lesser test of 'Recklessness' is added to the protection from disturbance in three circumstances. These are:

- disturbance to Schedule 1 birds and their nests, eggs and dependant young,
- disturbance to Schedule 5 animals in their place of shelter/protection, and
- disturbance to the places of shelter/protection of Schedule 5 animals.

This addition means that any person who deliberately takes an unacceptable risk or fails to notice an obvious risk is falls under the Section irrespective of intention. The CRoW Act also provides greater protection to SSSIs from operations (and non operations) of owners, occupiers and third party users of the SSSI.

For further information see: <https://www.legislation.gov.uk/ukpga/1981/69>

HABITAT REGULATIONS 2017***General***

The Conservation of Habitats and Species Regulations 2017 ('The Habitat Regulations') consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. They also transpose elements of the EU Wild Birds Directive in England and Wales. The Regulations provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites.

European Protected Species

Species listed under Annex II of the Habitats Directive were formally afforded protection by the Habitat Regulations. European protected species include the great crested newt, dormice and all species of bats. The provision relating to wild animal offences is reproduced below:

Protection of certain wild animals: offences

43.—(1) A person who—

- (a) deliberately captures, injures or kills any wild animal of a European protected species,
 - (b) deliberately disturbs wild animals of any such species,
 - (c) deliberately takes or destroys the eggs of such an animal, or
 - (d) damages or destroys a breeding site or resting place of such an animal,
- is guilty of an offence.

(2) For the purposes of paragraph (1)(b), disturbance of animals includes in particular any disturbance which is likely—

- (a) to impair their ability—

- (i) to survive, to breed or reproduce, or to rear or nurture their young; or
- (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate;
- or
- (b) to affect significantly the local distribution or abundance of the species to which they belong.
- (3) It is an offence for any person—
 - (a) to be in possession of, or to control,
 - (b) to transport,
 - (c) to sell or exchange, or
 - (d) to offer for sale or exchange,
 anything to which this paragraph applies.
- (4) Paragraph (3) applies to—
 - (a) any live or dead animal or part of an animal—
 - (i) which has been taken from the wild, and
 - (ii) which is of a species or subspecies listed in Annex IV(a) to the Habitats Directive;
 and
 - (b) anything derived from such an animal or any part of such an animal.
- (5) Paragraphs (1) and (3) apply regardless of the stage of the life of the animal in question.
- (6) Unless the contrary is shown, in any proceedings for an offence under paragraph (1) the animal in question is presumed to have been a wild animal.
- (7) In any proceedings for an offence under paragraph (3), where it is alleged that an animal or a part of an animal was taken from the wild, it is presumed, unless the contrary is shown, that that animal or part of an animal was taken from the wild.
- (8) A person guilty of an offence under this regulation is liable on summary conviction to imprisonment for a term not exceeding six months or to a fine, or to both.
- (9) Guidance as to the application of the offences in paragraph (1)(b) or (d) in relation to particular species of animals or particular activities may be published by—
 - (a) the appropriate authority; or
 - (b) the appropriate nature conservation body, with the approval of the appropriate authority.
- (10) In proceedings for an offence under paragraph (1)(b) or (d), a court must take into account any relevant guidance published under paragraph (9).
- (11) In deciding upon the sentence for a person convicted of an offence under paragraph (1)(d), the court must in particular have regard to whether that person could reasonably have avoided the damage to or destruction of the breeding site or resting place concerned.

Section 44 provides certain defences to the above.

The granting of a licence under Part 5 Section 55 of the Habitat Regulations

In order to carry out a lawful operation (e.g. development work which has full planning permission) that may result in any of the offences above, it is necessary to obtain a licence from Natural England to allow the operation to proceed.

However, in accordance with the requirements of the Habitats Regulations, a licence can only be issued after the following conditions have been satisfied:

- *that there is no satisfactory alternative, and*

- *that the action authorized will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.*
- *that the action is required in preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment;*

Full planning permission is required to apply for a Natural England licence (where such a consent is necessary for the work to be carried out). In addition, a method statement which details the survey results, methodology of work to be undertaken, mitigation and compensation measures, must be submitted to Natural England with the licence application.

Plans and Projects & Designated Sites

The Regulations provide procedure whereby designated SAC or SPA and other European Protected Sites are afforded protection from plans and projects that may be likely to have a significant effect on the Features for which these sites are designated. Where a significant effect is considered likely in combination with other projects an appropriate assessment is required to be undertaken. Details of this procedure can be found at Part 6 of the Act onwards, see link below.

For Full details of the 2017 Habitat Regulations see:

http://www.legislation.gov.uk/ukxi/2017/1012/pdfs/ukxi_20171012_en.pdf

NATURAL ENVIRONMENT AND RURAL COMMUNITIES ACT 2006

This Act places a specific duty to conserve biodiversity on all public bodies, including Local Planning Authorities. In order to aid with this process Section 41 of the Act requires the Secretary of State to publish lists of living organisms and habitats which are of principal importance for the purpose of conserving biodiversity. These are the national Biodiversity Action Plan (BAP) lists, and BAP projects are also undertaken at a County, Borough or District level.

For further information see: <https://www.legislation.gov.uk/ukpga/2006/16/part/3>

Technical Appendix 2

Update Survey Photos 2019

The annotated photos below are based on an update site visit in May 2019, to update survey information for the reserved matters mitigation recommendations, including detailed Badger survey.



South western boundary with road and grassland habitats as per previous survey



Main extent of grassland on site (NW field)



North east boundary hedgerow – species poor thorn hedge regularly maintained



Central Hedgerow –species poor thorn hedge, regularly maintained



South east boundary with dwellings



South west boundary adjacent to walled property (small amount of reptile habitat against wall)

Technical Appendix 3

Reptile Translocation Methodology

Translocation of Reptiles

In summary, translocation is the movement of animals, usually deliberately, from one location to another (Gent *et al*, 1998). The receptor site is the site to which reptiles are moved, the donor site (or in this case development site/construction zone) is where they are moved from.

The aim of the mitigation strategy is to ensure that an ‘equivalent population’ is maintained to that which existed before (Gent *et al*, 1998). Reptile mitigation strategies usually involve translocations and habitat management which is implemented between end March/April and Sept/October once any reptiles on site have emerged from hibernation.

Receptor sites must be assessed prior to the translocation of any reptiles, against criteria provided as good practice guidance. This ascertains the existing population of reptiles on the receptor site and identifies any habitat management needs in order to provide the optimum habitat for translocated reptiles.

HGBI (1998) and Gent *et al* (1998) recommend that ‘reasonable effort’ should be undertaken to clear a site of reptiles prior to any works being carried out. Interpretation of what ‘reasonable effort’ translates as in minimum trapping days and capture methodologies is provided in **Table A1** below.

Monitoring is necessary in the medium and long term in order to assess the success or otherwise of the translocation programme.

Capture Areas Assessment

The areas of the site within the construction zone needs to be assessed as to potential to support reptiles and likely populations present.

Receptor Area Assessment

A receptor site for reptiles needs to meet certain criteria to ensure that the conservation status of the populations of reptiles on the capture site and any on the receptor site are maintained. In order that a receptor site is sustainable in the long term the following assessment criteria recommended by HGBI (1998) have been used to find a site:

- A receptor site should be local to the donor site, and as close as possible to it (at least within the same county or similar administrative area, with similar geology/habitat);
- Not currently supporting a viable breeding population of the species to be translocated, for known reasons, or be capable of supporting them given suitable habitat management and creation;
- Not be subject to planning or other threats in the foreseeable future;
- Subject to a written, agreed and funded pre- and post-translocation management agreement;

- Subject to a written, agreed and funded pre- and post-translocation monitoring programme.

There have been various translocation programmes which have assessed the populations and carrying capacities of a range of different reptile habitats particularly in relation to slow-worms. It is widely recognised that slow-worms can, in their ideal habitat, regularly occur at 1000+ per hectare but are usually present at lower densities. However it should always be carefully considered that few sites have large areas of continuous good slow-worm habitat capable of supporting such high populations although smaller, localised areas of a site may do so. When estimating the carrying capacity of a release site and considering the number of reptiles to be translocated, a precautionary approach will be used. The mitigation strategy will provide a larger area of suitable habitat at the receptor site than at the capture site.

Translocation Methodology

In order to fulfil a translocation of reptiles from the development site to the receptor sites, the animals must be caught, or in the case of a very low population discouraged from the areas of the site to be lost. The most effective method for capture involves the placing of cut up roofing felt or other materials such as corrugated iron sheeting, wood or plastic that snakes and lizards hide under. Refugia/Tins are best placed in locations which will be attractive to reptiles (e.g. 'sun-traps').

The most profitable time for capturing reptiles is generally between late April - June, and again between late August and late September, depending on weather conditions. The suggested number of days required to catch reptiles for a reasonable effort to remove the population is described in **Table A1** above.

Capture Site Preparation

The development site must be prepared in order to facilitate the successful removal of reptiles. Sheets of roofing felt and tin will be placed across the site to act as refugia for the reptiles. They will be placed at a high density in suitable habitat. Areas of suitable reptile habitat with a high reptile density may have a tin density of up to 5 refugia per 10m², in line with the guidance in **Table A1**. The placement of a higher number of refugia on site will increase the efficiency of capture and can reduce the number of trapping days required to clear the site of reptiles.

Capture Effort

Table A1 provides the suggested capture effort for reptile species, based on good practice guidance (HGBI, 1998). Reptile translocation can in some circumstances require at least one season (spring to autumn), and sometimes longer, to ensure that all reptiles are removed from the development site.

The purpose of this type of translocation is to make reasonable effort to remove all reptiles from a site prior to a development. Where reptile populations are low or on small sites, Natural England often provide additional guidance that reasonable effort has been made and translocation to be considered complete in any area. The capture rate needs to have declined to zero over at least three to five consecutive trapping visits in suitable weather conditions.

Table A1: Capture Effort for Common Reptiles

Species	Population size (adult density)	Tin density (tins/ha)	Trapping days in good weather
Slow-worm	High (> 100 / ha)	100	All suitable days between March & September or a full year (min. 90 suitable days)
	Medium (> 50 / ha)	100	All suitable days between March & September or a full year (min. 70 suitable days)
	Low (< 50 / ha)	50	60 suitable days
Common lizard	High (> 80 / ha)	100	All suitable days between March & September or a full year (min. 90 suitable days)
	Medium (> 40 / ha)	100	All suitable days between March & September or a full year (min. 70 suitable days)
	Low (< 20 / ha)	50	60 suitable days
Grass snake	High (> 4 / ha)	100	All suitable days between March & September or for two years (min. 90 suitable days)
	Medium (2 - 4 / ha)	100	All suitable days between March & September or two years (min. 70 suitable days)
	Low (< 2 / ha)	50	60 suitable days

The guidelines above are likely to change according to the habitats on a site and populations of reptiles, and manipulation of habitats prior to construction can reduce the number of trapping days, allowing for more efficient capture of reptiles on a translocation site.

Habitat Manipulation

The areas of habitat affected by the development will be carefully modified to reduce their suitability for reptiles where necessary. This will encourage reptile movement within the site to increase capture in key areas around refugia and may also encourage some dispersal to suitable retained habitats. The grass height will be reduced by cutting to no less than 10cm on the first cut and will be phased in bands and habitat areas across the site. The location and timing of this process will be guided by capture rates in the different areas of the site. Habitat manipulation can be used to increase catch efficiency.

Translocation programme

The translocation is inspected regularly and any reptiles are captured and moved, using the methods described above to the receptor site. For the translocation to be considered complete in any area, the capture rate needs to have declined to zero over at least three to five consecutive trapping visits in suitable weather conditions.

Close monitoring of the capture rate will allow a judgement to be made of the number of visits considered to be necessary (in relation to guidelines in **Table A1**). The site will be walked very slowly in order to search for basking reptiles and by carefully lifting each refugia, an attempt will be made to catch any reptiles basking beneath.

All reptiles will be transported to the receptor site in a secure ventilated container. At the end of each visit all reptiles caught will be released in suitable conditions at the receptor site. Details of all captures and releases will be recorded.

Exclusion Fencing

Reptile fencing will be used where required to prevent reptiles returning to cleared areas, and where populations are considered sufficient to warrant it (it is often in-effective with low populations).

Supervised site clearance

Following the completion of the translocation in any areas of the site, a supervised site clearance will be carried out. This will take place outside of the hibernation season usually between April- early October (November – February is the main hibernation period dependent on weather conditions). The technique is a last method used and requires very careful specialist supervision. Normal destructive search rates are between 0.1 and 1.0 ha per day depending on machine size and habitat type.

The search will begin by dismantling rubble piles and other debris by hand. Reptiles may be found sheltering in these structures. Following this, the vegetation will be stripped using an excavator and bucket. Firstly, the top few centimetres of the ground or first layer of rubble should be removed, to expose reptiles sheltering in crevices just below the surface. At least one experienced reptile handler should be positioned to catch any remaining reptiles as they are disturbed. Following this, larger and deeper excavations can be made, concentrating on areas which afford shelter to reptiles, such as tree stumps and buried rubble. Particular care should be taken when emptying the bucket in case any reptiles are dug up with the spoil. It is not anticipated that many reptiles (if any) are discovered as the reptile populations will have almost completely been moved by this stage.

Prior to starting works, the contractors will be alerted to the presence of protected species on the site and provided with the method statement and plans. The contractors will be shown reptiles, so that they are familiar with their identification, should they come across them during vegetation works.

Monitoring

Following completion of the work, monitoring of the reptile population at the receptor site is recommended during the following two years, in order to determine the success of the translocation project.

Natural England (English Nature, 1998) suggests the following guidance which may determine the ‘success’ of a mitigation strategy:

- Removal of a ‘reasonable proportion’ of animals from a development site or no significant impact from development where in situ conservation is involved;
- Establishment and maintenance of a range of suitable habitats: with the presence of ‘good’ features and absence of ‘negative’ features;
- Breeding and successful recruitment;
- Re-establishment of animals in a range of habitat or spread of the animals throughout a site or to adjacent sites;

- Establishment of an appropriate age structure in the population;
- Survival of a large proportion of the animals that were moved;
- Establishment of:
 - A viable population
 - An expanding population
 - An ‘equivalent’ population to that which previously occurred
 - A population that is fluctuating in size within acceptable limits;
- Persistence of individual animals over a number of years.

References

Herpetofauna Groups of the British Isles (HGBI) Guidelines (1998) “Evaluating Local Mitigation/Translocation Programmes: Maintaining Best Practice and Lawful Standards.” HGBI Advisory notes for Amphibian and Reptile Groups (ARGs). HGBI, c/o Froglife, Halesworth, personal collection.

Froglife, 1999. Froglife Advice Sheet 10. Reptile Survey. An introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife, Halesworth, Suffolk.