



Ecology Consultancy

The Vinery , Angmering, West Sussex / Reptile Survey / **Report for Fargo**



The Vinery, Angmering, West Sussex

Reptile Survey

Report for Fargo

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Executive Summary

The Ecology Consultancy was commissioned to carry out a reptile survey of land at The Vinery, Poling, West Sussex. This survey was recommended based on findings from the preliminary ecological appraisal which identified the potential for this species at the site. The main findings of the survey are as follows:

- The survey, carried out in October 2012, did not find any reptiles within the site during any of the survey visits.
- Although grass snakes *Natrix natrix* were not recorded during the survey, the site may form part of a home range for this species. Grass snake may periodically pass through the site at certain times of the year en-route to water bodies within the locality.
- Following the reptile survey, this species group is not considered to pose a constraint to development proposals.
- During the sixth reptile survey visit one female great crested newt *Triturus cristatus* was found within the north-east of the site. This species does pose a constraint to development.
- Great crested newts receive protection under the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2010 (as amended). Under current legislation both individuals and the habitats they use for shelter and breeding are protected.
- Any ground works or vegetation clearance around the site has the potential to negatively impact on this species through both habitat loss, and the killing or injury of individuals. In order to adhere to current legislation a European Protected Species Mitigation (EPSM) licence must be obtained from Natural England prior to any works at the site.
- A licence application will require a written Method Statement to be compiled detailing measures to mitigate against any potential impact on great crested newts. This approach will require a programme of translocation to re-locate great crested newts away from the development footprint prior to works starting and will require individuals to be moved to a suitable receptor area.
- Further details are provided in the Mitigation Strategy detailed in Section 5. The information provided in this section will be incorporated into a Method Statement document which must be submitted as part of the licence application to Natural England.

1 Introduction

BACKGROUND

- 1.1 In October 2012, The Ecology Consultancy was commissioned by Fargo, a horticultural wholesale supplier of goods to the UK horticultural industry, to carry out a reptile survey. Survey findings are presented in this report and possible impacts of the development on this species group are identified and discussed.
- 1.2 The reptile survey follows on from a Preliminary Ecological Appraisal (The Ecology Consultancy 2012) which identified potentially suitable habitat for this species within the site.

SCOPE OF REPORT

- 1.3 The report provides an assessment of the status of reptiles on the site, providing information on their presence / likely absence and distribution. Potential impacts of the proposed development are identified and measures to mitigate the effects of the proposed development on reptiles are discussed in outline.
- 1.4 The report also includes an outline Great Crested Newt Mitigation Strategy as this species was recorded within the site during the reptile survey.

SITE CONTEXT AND STATUS

- 1.5 The site measured approximately 4.5 hectares (ha) in size. The survey area comprised hedges and scrub, drainage ditches, tall ruderal vegetation and introduced shrub, and a building with surrounding hard-standing. There were also grassland areas, some of which were horse grazed. There were two further buildings adjacent to the horse grazed fields.
- 1.6 The National Grid Reference for the centre of the site is TQ 051 054.
- 1.7 The site is located to the south of the A27 (Arundel Road). There is an access road (The Vinery) to the site from the north-eastern boundary, a public footpath lies along the northern boundary, continuing diagonally and bisecting the western section of the site. A hedge and scrub line, and shallow drainage ditches form the western and southern boundaries, with a scrub and tree line along the eastern boundary. The surrounding area comprises light industry, arable farmland and residential

development with numerous areas of woodland listed on the National Inventory for ancient semi-natural woodland (ASNW).

DESCRIPTION OF THE PROPOSALS

- 1.8 Proposals involve the redevelopment of the site into a new horticultural plant nursery, including construction of a new office complex and polytunnels. There is also a soft landscaping scheme that comprises tree and scrub planting, enhancements to the ditch system, and a new balancing pond.
- 1.9 It is understood that under current proposals the western third of the site, beyond the public footpath, will remain unchanged with grassland, trees, scrub and drainage ditches being retained.

2 Methodology

REPTILE SURVEY

Presence/absence survey

- 2.1 The survey protocol followed accepted standards for reptile surveys as set out in Hill *et al.* (2005).
- 2.2 The survey involved a combination of visually searching for reptiles (direct observation) and the use of artificial refugia.
- 2.3 On the 12th October 2012 artificial refugia were carefully placed around the site within areas of suitable reptile habitat. Refugia comprised individual 1m² (approximately) pieces of heavy grade roofing felt. These were laid out at approximately 5m intervals around the site. Potentially suitable reptile habitat within the survey area consisted of a mosaic of tall ruderal vegetation, areas of grassland and scrub, and introduced shrubs. A total of 111 refugia were used, equating to a density of 24 per ha.
- 2.4 A total of seven survey visits were undertaken in October 2012. Refugia were checked during appropriate weather conditions, that is, where temperatures ranged between 9°C and 20°C, with little rain or wind. Visits were carried out, where possible, between the hours of 08.30-11.00 or 16.00-18.30, which are the optimum times for recording reptiles, although the time of day varied slightly according to weather conditions.

Population Size Estimate

- 2.5 An assessment of reptile population sizes is typically based on Froglife (1999) guidance which requires a minimum of 20 repeat survey visits. Population sizes are then assigned to one of three categories based on the peak count of individuals for each species across all the visits. It should be noted that only seven visits were carried out and that the population assessment for the proposed development site is only an estimate based on the guidance (see Table 1). However, population assessments are typically based on a relatively low survey effort with 10 refuge sheets per ha, in contrast to a density of 24 refuge sheets per ha as employed at the site, and therefore it is likely that the survey data is relatively more robust.

Table 1: Population score (Froglife 1999).

Species	Low Population	Good Population	Exceptional Population
Adder <i>Vipera berus</i>	<5	5-10	>10
Grass Snake <i>Natrix natrix</i>	<5	5-10	>10
Common Lizard <i>Zootoca vivipara</i>	<5	5-20	>20
Slow Worm <i>Anguis fragilis</i>	<5	5-20	>20

LIMITATIONS

- 2.6 Reptile surveys can be undertaken anytime between March to October in suitable weather conditions; however, the optimum months for survey are April, May and September (Froglife 1999).
- 2.7 However, the survey was carried out within the recommended survey period in suitable weather conditions, and was considered sufficiently rigorous to determine the presence/absence and distribution of reptiles within the proposed development site at that time.

3 Results

REPTILE SURVEY

Overview

- 3.1 The survey did not find any reptiles within the site on any of the survey visits.
- 3.2 During the sixth reptile survey visit one female great crested newt *Triturus cristatus* was found under artificial refugia within the north-east of the site.
- 3.3 The distribution of artificial refugia within the site and location of the great crested newt is presented on the Reptile Survey Map in Appendix 1.
- 3.4 Despite grass snake *Natrix natrix* not being recorded from the site during the course of the survey visits, because there are past records for it in the locality, as detailed in the previous ecology report (The Ecology Consultancy 2012), there remains potential for the site to form part of a home range for this species. Grass snakes may occupy territories of over 1km where water bodies provide suitable foraging resources.

Reptile Population Assessment

- 3.5 Due to the absence of reptiles within the site, a population assessment, as based on current guidance (Froglife, 1999), could not be made.

4 Conclusions and Recommendations

CONCLUSIONS

- 4.1 Despite areas of suitable habitat for reptiles within the site no reptile species were recorded. This may be due to the current levels of disturbance, which include horse grazing and other activities that may discourage reptiles from using the site.
- 4.2 The site may form part of a home range for grass snakes which may periodically pass through en-route to water bodies within the locality in order to feed.
- 4.3 It is considered that the survey was sufficiently rigorous to determine absence of reptiles within the proposed development site.
- 4.4 Following the reptile survey, this species group is not considered to pose a constraint to development proposals.
- 4.5 The presence of a great crested newt, found during the sixth reptile survey visit does, however pose a constraint to development.
- 4.6 Great crested newts receive protection under the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2010 (as amended). Under current legislation both individual newts and the habitats they use for shelter and breeding are protected.
- 4.7 Any ground works or vegetation clearance around the site has the potential to negatively impact on this species through both habitat loss, and the killing or injury of individuals. In order to adhere to current legislation a European Protected Species Mitigation (EPSM) licence must be obtained from Natural England to allow works to be carried out that would otherwise infringe the legislation.
- 4.8 A licence application will require a written Method Statement to be compiled detailing measures to mitigate against any potential impact upon great crested newts. This approach will require a programme of translocation to re-locate great crested newts away from the development footprint prior to works starting and will require individuals to be moved to a suitable receptor area. Further details are provided in the Mitigation Strategy detailed in Section 5. The information provided in this section will be incorporated into a Method Statement document which must be submitted as part of the licence application to Natural England.

RECOMMENDATIONS

Breeding bird season

- 4.9 In order to avoid any potential impacts on breeding birds, clearance of suitable nesting bird habitat, which includes areas of scrub and shrubs, should not be carried out during the main bird nesting season, which is normally taken to run from **March to August** inclusive. If any nesting birds are found at any time during clearance works, work should stop immediately and an ecologist consulted.
- 4.10 If vegetation clearance within this time frame is unavoidable vegetation removal should be carried out under an ecological watching brief. If any active nests are found during the works, all activities in the vicinity of the nest must cease and the nests should be protected until such time as the young have fledged and left the nest.

Wildlife corridors and landscape planting

- 4.11 The northern, western and southern boundaries may provide an important corridor for the movement of wildlife across the wider landscape, including grass snakes and great crested newts.
- 4.12 It is recommended that boundary vegetation is retained and enhanced where possible during re-development. If it is not possible to retain boundary features during the re-development activities, compensatory planting should be carried out following the works in order to replace valuable habitats. Species selected should be appropriate to the character of the area and be of local stock. Further guidance is provided by Herbert, Samuel & Patterson (1999).
- 4.13 Where feasible, ornamental planting schemes should be comprised of a high percentage of native species or plants of known wildlife value to increase the cover and foraging resource for wildlife. An example list of suitable species is included in Appendix 6. Potentially invasive or aggressive plant species that may out-compete native species should be avoided e.g. cherry laurel *Prunus laurocerasus*, cotoneaster *Cotoneaster spp.*, rhododendron *Rhododendron spp.*, snowberry *Symphoricarpos spp.* etc.

5 Great Crested Newt Mitigation Strategy

OUTLINE

- 5.1 This strategy has been prepared as great crested newts are known to be present within the footprint of the works area; it proposes mitigation for losses to their terrestrial habitat. The strategy is designed to avoid killing or injuring any great crested newts within the works area. It also seeks to enhance the habitat that will remain post development and makes recommendations for habitat creation.
- 5.2 The information provided in this section will be incorporated into the Method Statement submitted as part of the licence application to Natural England. Mitigation will involve a programme of translocation to re-locate great crested newts away from the development footprint to a suitable receptor area prior to works commencing.

POND SURVEYS

- 5.3 A series of surveys for all water bodies within a 500m radius of the site must be carried out prior to the licence application to Natural England. This is a requirement of any licence application as the survey data is used to determine the population size of great crested newts. The population size is then used to determine the number of capture visits required for the translocation process.
- 5.4 An HSI assessment based on criteria developed by Oldham *et al* (2000) must be carried out for each pond within 500m, followed by four pond surveys which are required to demonstrate presence or absence. Pond surveys should follow the protocol in the *Great Crested Newt Mitigation Guidelines* (English Nature, 2001). Surveys should be carried out between mid-March and mid-June with at least two of those visits taking place within the peak survey period of mid-April to mid-May. For each survey visit at least three survey techniques should be employed to include egg searching, torching, netting and bottle trapping with at least two of the surveys employing the bottle trapping.
- 5.5 Where great crested newts are found to be present, two additional survey visits must be carried out at those ponds in order to enable a population estimate, with at least one of these visits to be carried out between mid-April and mid-May, and involving bottle trapping.

RECEPTOR SITE

- 5.6 The proposed receptor area is within the curtilage of The Vinery within the north of the site. This area currently comprises an area of poor semi-improved grassland and scattered scrub. The habitats will be enhanced prior to the translocation in order to increase its suitability for great crested newts. Enhancement will include the creation of a wildflower meadow throughout the receptor area which will be achieved through re-seeding the grassland with a wildflower seed mix. The seed mix will be an Emorsgate mix or similar, and comprise a range of suitable native wildflower species in order to increase the value of the grassland for invertebrates and thus to increase prey availability for newts.
- 5.7 The area will measure at least 0.2 ha although the exact extent will be determined by the client, ecologist and landscape architect following the results of the population estimate. Hedgerows to the north connect the receptor site to suitable terrestrial and breeding habitat to the east and west, which includes arable fields and a series of water bodies. Additional hedge and tree planting to the south east and south west will also be carried out within the site as part of the landscape design. This will increase suitable habitat and connectivity to the surrounding area.
- 5.8 Industrial units bound the receptor area to the north, and the development site bounds the receptor area to the south, east and west.
- 5.9 This receptor site is set to remain free from any development activities. This area is contiguous with the development site and will support a varied grassland sward, scattered scrub and a hedgerow; a habitat structure favoured by great crested newts due to the foraging and sheltering opportunities that will be provided.
- 5.10 This area is contiguous with suitable habitat to the east and west, and its location will also enable great crested newts to re-colonise suitable on-site habitat post works and maintain connectivity to surrounding off-site habitat.
- 5.11 The carrying capacity of the receptor area will be increased through grassland re-seeding and the placement of additional habitat such as hibernacula prior to the translocation commencing. This will also serve to compensate for the loss of newt habitat within the remainder of the development area.

- 5.12 In accordance with Natural England guidelines (2004), the proposed receptor site provides sufficient habitat quality and quantity to accommodate any great crested newts within the site. It is anticipated that this translocation project will not detrimentally impact the conservation status of the local reptile population.
- 5.13 Grassland cutting must be limited to once or twice a year in early spring or autumn using a hand-held strimmer or similar, and the sward should only be cut to a maximum of 150mm above ground level. The grass should be left to grow through the summer. Any encroaching scrub should be cut back periodically to limit its spread.

HABITAT ENHANCEMENT

- 5.14 The loss in terrestrial habitat as a result of development will be mitigated for by a series of enhancement measures as detailed below. In addition a new pond and two ditches have also been incorporated into the landscape design proposals.

Grassland Meadow

- 5.15 A grassland meadow, as detailed above in the Receptor Site Section, will be created within the north of the site.
- 5.16 Flower-rich grassland provides productive invertebrate habitats for a range of species including nectar-feeding species such as butterflies and moths *Lepidoptera* and bees and wasps *Hymenoptera* and for the larvae of many species providing a food source for newts.
- 5.17 The area proposed for a grassland meadow is currently horse grazed. The previous ecology survey identified the following floral composition: perennial rye grass *Lolium perenne*, false oat grass *Arrhenatherum elatius*, white clover *Trifolium repens*, red fescue *Festuca rubra*, daisy *Bellis perennis*, cock's-foot *Dactylis glomerata*, thistle *Cirsium* sp., Yorkshire fog *Holcus lanatus*, and ribwort plantain *Plantago lanceolata* (The Ecology Consultancy 2012).
- 5.18 It is recommended that the proposed meadow area undergoes scarification and over sowing or plug planting to increase the grassland diversity. This will enable the diversity to increase over time while existing species continue to provide cover for wildlife. It is recommended that a general purpose Emorsgate wildflower seed mix is used to increase overall species diversity within the grassland. The mix should

comprise bulky herbaceous perennials that can tolerate a sward dominated by coarse grasses.

- 5.19 Seed should ideally be sown in spring or autumn at a rate of 4g/m², but can be sown outside of these periods providing there is sufficient warmth and moisture. The seed bed should be firmed over using a roller or by treading and watered in.
- 5.20 Watering is most important during periods of dry weather in the four weeks following sowing and should be avoided, where possible, at all other times.
- 5.21 In the first growing season in areas where germination was less successful or seed coverage patchy, over-sowing at 4g/m² should be carried out.
- 5.22 The meadow should then be managed by cutting once or twice a year in early spring or autumn. The 'hay' should be cut to 150mm and left to dry for 1-7 days before being raked up and retained on-site in a corner of the meadow adjacent to the hedgerow. This stacked vegetation may provide suitable breeding habitat for grass snakes. Notable patches of pernicious weeds should firstly be removed by hand and, if still persistent, spot treated with selective, non-residual herbicide.

Hibernacula

- 5.23 A hibernacula should be created to provide additional hibernation opportunities within the receptor area. This should be situated within the northern boundary along the edge of the hedgerow and created through digging a shallow hole or trench and then filling it with a mixture of rubble and/or logs, covered with top-soil and re-seeded. A suggested hibernacula design is detailed in Appendix 4 and should be constructed in accordance with the specification detailed in the Great Crested Newt Mitigation Guidelines (2001).

Soft landscaping

- 5.24 As part of the development proposals additional meadow grassland creation as well as hedge and tree planting will be carried out throughout the site, increasing areas of terrestrial habitat for newts and other wildlife. Enhancement of site boundaries through tree and shrub planting will also serve to increase connectivity between the on-site habitats and those within the wider landscape. Hedgerows and tree lines and field boundaries serve as important corridors for wildlife, providing shelter and other resources enabling animals to move through the landscape.

EXCLUSION FENCING

- 5.25 On receipt of the licence from Natural England the capture and exclusion process can commence. This should be carried out within the active season for great crested newts taken to run between Mid-**March** and **October** inclusive.
- 5.26 A line of exclusion fencing will be installed around the boundary of the development footprint in order to separate the newt capture area from the receptor area and other surrounding suitable habitat. The fence line will be checked over by the project ecologist. The design of the fencing should be the same as that illustrated in the *Great Crested Newt Mitigation Guidelines* (Natural England 2004) and reproduced in Appendix 4. The fence should be made of UV resistant polythene approximately 500mm in height and buried 200mm deep into the ground. There should also be a turn out or roll down at the top of the fence facing out towards the receptor area. Pitfall traps will be installed at 5-10m intervals along the internal length of fence line. These must be located flush with the fence line with the top of the trap flush with or just below ground level.
- 5.27 The exact location of the fencing and density of pitfall traps will be decided on-site between the client, ecologist and fencing contractors. The exclusion fence will be retained until completion of the construction period and will be removed under an ecological watching brief.

HABITAT MANAGEMENT: FIRST PHASE

- 5.28 Habitats within the site comprise areas of tall ruderal vegetation, grassland, dense and scattered scrub and scattered trees.
- 5.29 Clearance of areas of scrub and scattered trees must avoid the nesting bird season as detailed above.
- 5.30 In the first phase areas of grassland, scrub and tall ruderal vegetation will be cut to 200mm above level to reduce the amount of available cover with small 'islands' of uncut vegetation retained as refuge habitat. This should be carried out immediately prior to commencing the translocation in order to facilitate capture. Vegetation will be cleared using hand tools, such as chain saws and strimmers. All cut vegetation will be removed from the site.

GREAT CRESTED NEWT CAPTURE

- 5.31 This must be carried out within the active season for great crested newts which is between Mid-**March** and **October** inclusive. The exact timing of the start point will be decided between the project ecologist and the client. This process will aim to relocate all great crested newts away from the footprint of construction. The main objective is to maintain and enhance the favourable conservation status of great crested newts in the local area.
- 5.32 All captured newts will be released into suitable grassland habitat within the north of the site, as detailed in the receptor site section above.
- 5.33 Once the capture programme has started the pitfall traps will be checked once daily by a suitably experienced ecologist early each morning before temperatures warm up. Any newts found within the traps will be caught by hand and kept temporarily in a smooth sided plastic container with sufficient covering material and secure fitted lid with ventilation holes. Other species, which may have entered the traps over night such as small mammals, will be captured and placed in separate containers for subsequent release to the receptor area. The sex, life stage and the location of all individuals collected and observed will be recorded. All animals will be released as soon as practical to the newt receptor area. A route will be taken around the site to enable each trap to be checked during each capture visit.
- 5.34 The exact number of trapping days can only be determined once a population assessment has been made following the pond surveys. Guidelines state that the minimum trapping period for a small population of great crested newts is 30 days (HGBI, 1998) and the trapping period for a large population is 90 days. The number of visits necessary will be determined by the pattern of newt captures, but will continue until there have been at least five consecutive visits with no animals caught or sighted. When this point is reached a destructive search of the site will be undertaken.

HABITAT MANAGEMENT: SECOND PHASE

- 5.35 All vegetation within the newt capture area should be reduced to ground level. This should be carried out towards the end of the newt capture programme, once capture rates have seen a significant decline. This point will be decided by the project ecologist after studying the catch data. This should be done using hand tools and under an ecological watching brief.

DESTRUCTIVE SEARCH

- 5.36 A destructive search is the process of destroying any remaining newt habitat within the capture area and translocating any remaining newts or other animals disturbed in the process. The destructive search will be initiated once capture rates have dropped to zero over five consecutive capture visits.
- 5.37 The destructive search will also entail the careful removal, by hand, of all potential refugia such as rubble piles, large piece of debris and logs in order to capture any sheltering animals. This will be undertaken by a suitably experienced ecologist.
- 5.38 A 360° excavator equipped with a toothed bucket will be used to strip the surface of the topsoil to approximately 100mm in depth throughout the newt capture area. The destructive search will be carried out under an ecological watching brief. The use of the excavator will follow the principles below:
- The health and safety of the machine operator and ecologist is paramount and a Safe System of Work will be established to minimise the inherent risks.
 - All on site operatives will hold current CSCS cards and a dedicated Risk Assessment for this operation will be drawn up in advance.
 - Excavators will not track on any previously undisturbed areas and all soil and arisings will be piled up to make windrows no more than 1.5m high. These windrows will be left undisturbed for a minimum of 24 hours to enable any animals within the soil to escape.
 - Windrows will be created on previously cleared ground and machines must not track back onto them.
 - All disturbed ground and windrows to be checked for newts, any newts disturbed in this process will be captured.

DURING AND POST CONSTRUCTION

- 5.39 The exclusion fence must remain in place until all construction works have been completed. The fence should then be removed under an ecological watching brief to ensure no animals are injured which may have taken refuge along the fence line.
- 5.40 The exclusion fence should be regularly checked by on-site personnel for condition and correct operation throughout the construction period and any breaks repaired as

soon as possible. No materials should be stored on or near the fence line and the contractors must be made fully aware of its position and function.

HABITAT ENHANCEMENT

- 5.41 A new balancing pond and two connecting ditches will be created within the south-western site extent. The new ditches will connect the pond to the ditch network in the wider surrounds of the site. The creation of this pond and two ditches will increase the area of suitable newt breeding habitat.
- 5.42 In order to maximise pond suitability for great crested newts, the pond will have an overall surface area of between 100m² and 300m² with a depth of at least 1m at its deepest point.

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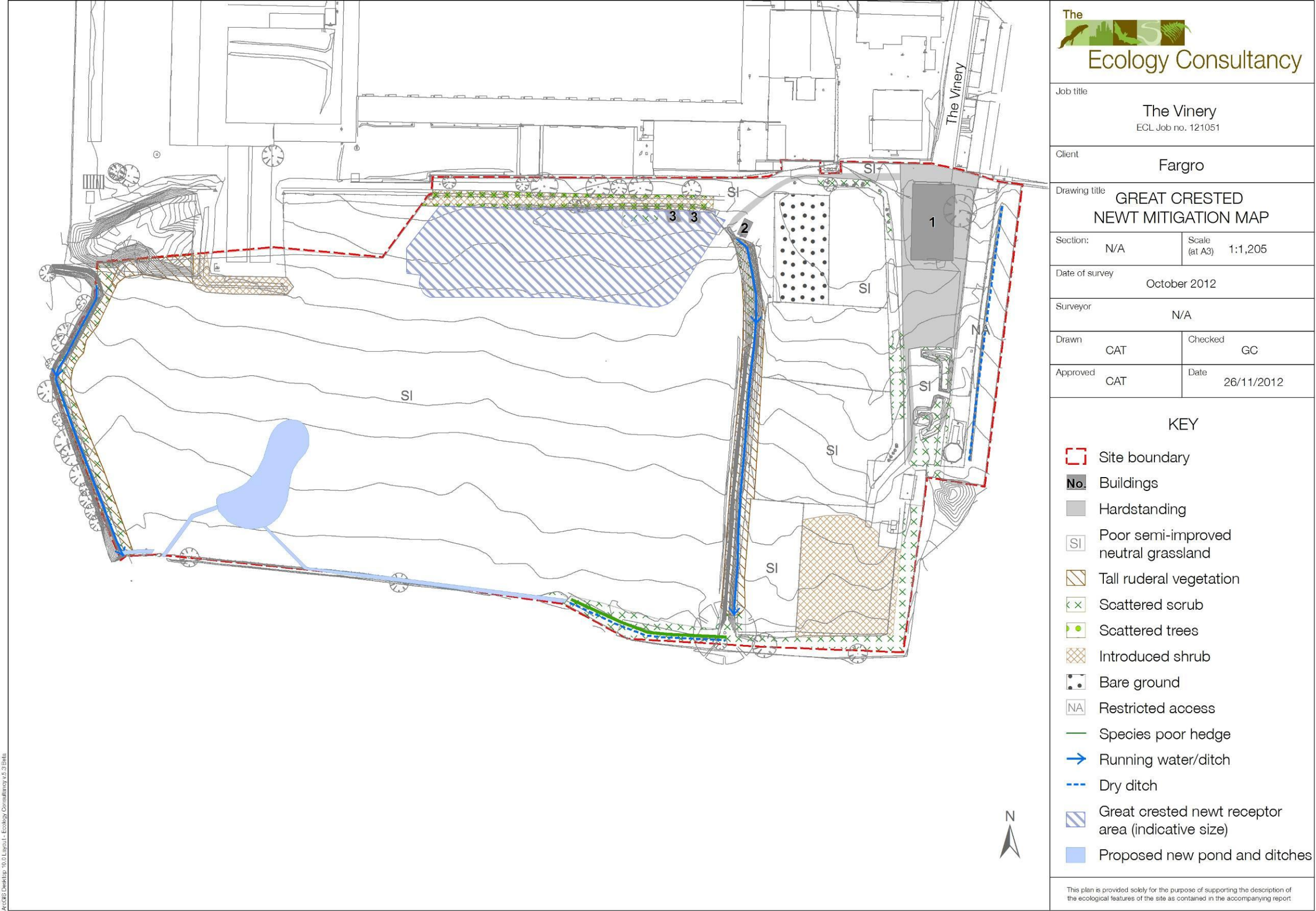
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Appendix 1: Site Maps

Map 1: Reptile Survey Map



Map 2: Great Crested Newt Mitigation Map



Appendix 2: Survey Results

2012 Reptile Survey Recording Form

AD=Adult SUB-AD=Sub-adult JUV=Juvenile UNID=Unidentified

Client: Fargo	Job no: 120908	Date: 17/10/12	Surveyor: Patrick Austin	Sky (Octares 0-8): 6	Temp: 16°C
Project: The Vinery, Poling, West Sussex		Time: 10.50-12.05	Survey no: 1	Wind (Beaufort scale 0-12): 3	Rain: None

	Common lizard							Slow worm							Grass snake						
Tile no :	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total
	M	F						M	F						M	F					
A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
J	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
K	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2012 Reptile Survey Recording Form

AD=Adult SUB-AD=Sub-adult JUV=Juvenile UNID=Unidentified

Client: Fargo	Job no: 120908	Date: 19/10/12	Surveyor: Patrick Austin	Sky (Octares 0-8): 8	Temp: 13°C
Project: The Vinery, Poling, West Sussex		Time: 11.30-12.30	Survey no: 2	Wind (Beaufort scale 0-12): 2-3	Rain: None

	Common lizard							Slow worm							Grass snake						
Tile no :	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total
	M	F						M	F						M	F					
	A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
J	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
K	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2012 Reptile Survey Recording Form

AD=Adult SUB-AD=Sub-adult JUV=Juvenile UNID=Unidentified

Client: Fargo	Job no: 120908	Date: 22/10/12	Surveyor: Patrick Austin	Sky (Octares 0-8): 8	Temp: 15°C
Project: The Vinery, Poling, West Sussex		Time: 11.30-12.30	Survey no: 3	Wind (Beaufort scale 0-12): 1-2	Rain: None

	Common lizard							Slow worm							Grass snake						
Tile no :	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total
	M	F						M	F						M	F					
A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
J	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
K	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2012 Reptile Survey Recording Form

AD=Adult SUB-AD=Sub-adult JUV=Juvenile UNID=Unidentified

Client: Fargo	Job no: 120908	Date: 24/10/12	Surveyor: Patrick Austin	Sky (Octares 0-8): 8	Temp: 15°C
Project: The Vinery, Poling, West Sussex		Time: 11.00-12.00	Survey no: 4	Wind (Beaufort scale 0-12): 1-2	Rain: None

	Common lizard							Slow worm							Grass snake						
Tile no :	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total
	M	F						M	F						M	F					
A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
J	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
K	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2012 Reptile Survey Recording Form

AD=Adult SUB-AD=Sub-adult JUV=Juvenile UNID=Unidentified

Client: Fargo	Job no: 120908	Date: 26/10/12	Surveyor: Patrick Austin	Sky (Octares 0-8): 8	Temp: 10°C
Project: The Vinery, Poling, West Sussex		Time: 10.30-11.30	Survey no: 5	Wind (Beaufort scale 0-12): 1-2	Rain: None

	Common lizard							Slow worm							Grass snake						
Tile no :	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total
	M	F						M	F						M	F					
A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
J	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
K	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2012 Reptile Survey Recording Form

AD=Adult SUB-AD=Sub-adult JUV=Juvenile UNID=Unidentified

Client: Fargo	Job no: 120908	Date: 29/10/12	Surveyor: Patrick Austin	Sky (Octares 0-8): 6	Temp: 12°C
Project: The Vinery, Poling, West Sussex		Time: 11.30-12.30	Survey no: 6	Wind (Beaufort scale 0-12): 1-2	Rain: None

	Common lizard							Slow worm							Grass snake						
Tile no :	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total
	M	F						M	F						M	F					
A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
J	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
K	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2012 Reptile Survey Recording Form

AD=Adult SUB-AD=Sub-adult JUV=Juvenile UNID=Unidentified

Client: Fargo							Job no: 120908			Date: 31/10/12		Surveyor: Patrick Austin		Sky (Octares 0-8): 5		Temp: 13°C					
Project: The Vinery, Poling, West Sussex									Time: 11.30-13.30		Survey no: 7		Wind (Beaufort scale 0-12): 4		Rain: None						
	Common lizard						Slow worm						Grass snake								
Tile no :	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total	Ad		Sub ad	Peak count (ad/sub-ad)	Juv	Unid	Total
	M	F						M	F						M	F					
A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
J	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
K	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
				0			0				0			0				0			0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix 3: Legislation

Important Notice: This section contains details of legislation and planning policy applicable in Britain only (i.e. not including the Isle of Man, Northern Ireland, the Republic of Ireland or the Channel Islands) and is provided for general guidance only. While every effort has been made to ensure accuracy, this section should not be relied upon as a definitive statement of the law.

A NATIONAL LEGISLATION AFFORDED TO SPECIES

The objective of the EC Habitats Directive¹ is to conserve the various species of plant and animal which are considered rare across Europe. The Directive is transposed into UK law by The Conservation of Habitats and Species Regulations 2010(as amended) (formerly The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) and The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended).

The Wildlife and Countryside Act 1981 (as amended) is a key piece of national legislation which implements the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and implements the species protection obligations of Council Directive 2009/147/EC (formerly 79/409/EEC) on the Conservation of Wild Birds (EC Birds Directive) in Great Britain.

Since the passing of the Wildlife & Countryside Act 1981, various amendments have been made, details of which can be found on www.opsi.gov.uk. Key amendments have been made through the Countryside and Rights of Way (CROW) Act (2000) and Nature Conservation (Scotland) Act 2004.

Other legislative Acts affording protection to wildlife and their habitats include:

- Deer Act 1991
- Countryside and Rights of Way (CROW) Act 2000
- Natural Environment & Rural Communities (NERC) Act 2006
- Protection of Badgers Act 1992
- Wild Mammals (Protection) Act 1996

Species and species groups that are protected or otherwise regulated under the aforementioned domestic and European legislation, and that are most likely to be affected by development activities, include herpetofauna (amphibians and reptiles), badger, bats, birds, dormouse, invasive plant species, otter, plants, red squirrel, water vole and white clawed crayfish.

Explanatory notes relating to species protected under The Conservation of Habitats and Species Regulations 2010 (which includes smooth snake, sand lizard, great crested newt and natterjack toad), all bat species, otter, dormouse and some plant species) are given below. **These should be read in conjunction with the relevant species sections that follow.**

¹ Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora

- In the Directive, the term ‘deliberate’ is interpreted as being somewhat wider than intentional and may be thought of as including an element of recklessness.
- The Conservation of Habitats and Species Regulations 2010 does not define the act of ‘migration’ and therefore, as a precaution, it is recommended that short distance movement of animals for e.g. foraging, breeding or dispersal purposes are also considered.
- In order to obtain a European Protected Species Mitigation (EPSM) licence, the application must demonstrate that it meets all of the following three ‘tests’: i) the action(s) are necessary for the purpose of preserving public health or safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequence of primary importance for the environment; ii) that there is no satisfactory alternative and iii) that the action authorised will not be detrimental to the maintenance of the species concerned at a favourable conservation status in their natural range.

Herpetofauna (Amphibians and Reptiles)

The sand lizard *Lacerta agilis*, smooth snake *Coronella austriaca*, natterjack toad *Epidalea calamita* and great crested newt *Triturus cristatus* receive full protection under The Conservation of Habitats and Species Regulations 2010 through their inclusion on Schedule 2. The pool frog *Pelophylax lessonae* is also afforded full protection under the same legislation. Regulation 41 prohibits:

- Deliberate killing, injuring or capturing of species listed on Schedule 2
- Deliberate disturbance of any Schedule 2 species as:
 - a) to impair their ability:
 - (i) to survive, breed, or reproduce, or to rear or nurture young;
 - (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate
 - b) to affect significantly the local distribution or abundance of the species
- Deliberate taking or destroying of the eggs of a Schedule 2 species
- Damage or destruction of a breeding site or resting place
- Keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part thereof.

With the exception of the pool frog, these species are also currently listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under this Act, they are additionally protected from:

- Intentional or reckless disturbance (at any level)
- Intentional or reckless obstruction of access to any place of shelter or protection
- Selling, offering or exposing for sale, possession or transporting for purpose of sale.

Other native species of herpetofauna are protected solely under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). Species such as the adder *Vipera berus*, grass snake *Natrix natrix*, common lizard *Zootoca vivipara* and slow-worm *Anguis fragilis* are listed in respect to Section 9(1) & (5). For these species, it is prohibited to:

- Intentionally (or recklessly in Scotland) kill or injure these species
- Sell, offer or expose for sale, possess or transport for purpose of sale these species, or any part thereof.

Common frog *Rana temporaria*, common toad *Bufo bufo*, smooth newt *Lissotriton vulgaris* and palmate newt *L. helveticus* are listed in respect to Section 9(5) only which affords them protection against sale, offering or exposing for sale, possession or transport for the purpose of sale.

How is the legislation pertaining to herpetofauna liable to affect development works?

A European Protected Species (EPS) Licence issued by the relevant countryside agency (e.g. Natural England) will be required for works liable to affect the breeding sites or resting places of those amphibian and reptile species protected under The Conservation Habitats and Species Regulations 2010. A licence will also be required for operations liable to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (e.g. survive, breed, rear young and hibernate). The licences are to allow derogation from the relevant legislation but also to enable appropriate mitigation measures to be put in place and their efficacy to be monitored.

Although not licensable, appropriate mitigation measures may also be required to prevent the intentional killing or injury of adder, grass snake, common lizard and slow worm, thus avoiding contravention of the Wildlife and Countryside Act 1981 (as amended).

Appendix 4: Exclusion Fence & Hibernacula Design

Figure 1: Newt exclusion fence design: From Natural England Great crested newt mitigation guidelines (2001).

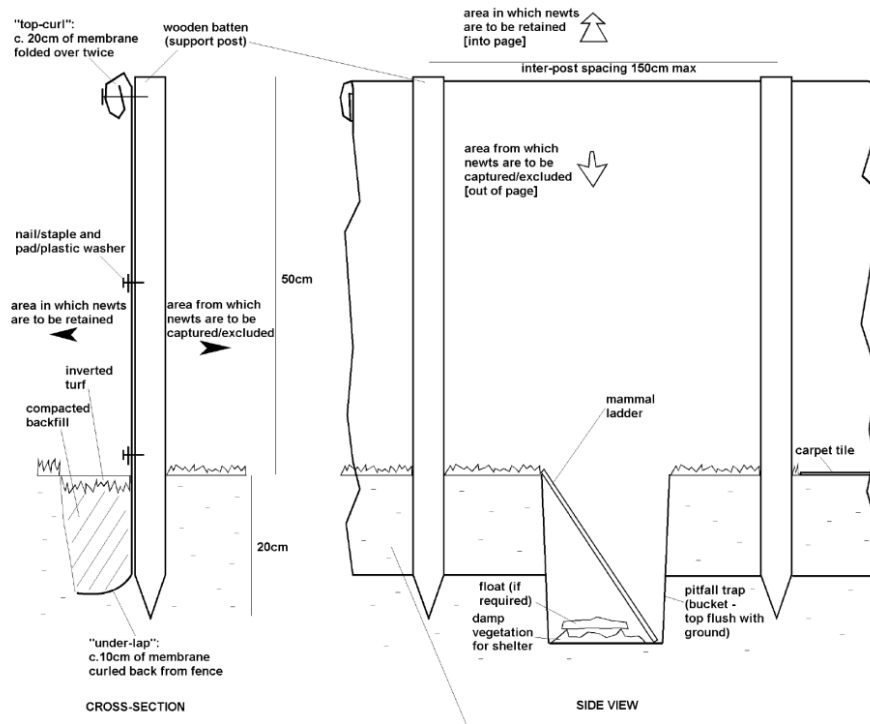
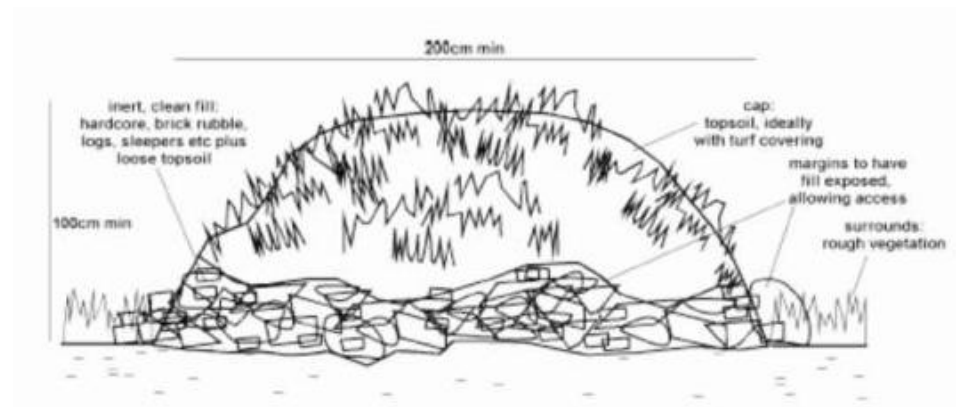


Figure 2: Newt hibernacula design: From Natural England Great crested newt mitigation guidelines (2001).



Appendix 5: Recommended Planting

ORNAMENTAL AND NATIVE SPECIES OF WILDLIFE VALUE

The list below gives some easily sourced plants which are of proven value to wildlife. It is intended as a guide only as there are many other species that perform this role. It includes a number of ornamental species which are not native and can be used in combination with native species in more formal situations. In informal landscapes the emphasis should be on the use of native species.

Different horticultural varieties of the following species are commonly available, but where available standard stock is advised, especially for native species. Single flowering plants should be chosen over double flowering ('flore pleno') varieties. With exception of those marked as * (biennials) and ** (annuals) all species are perennial. E = Exotic, N = Native.

N.B. Care should always be exercised in designing schemes. This list includes species that may be harmful if handled or ingested. Numerous sources of further information are available; see for instance *Poisonous Plants and Fungi: An Illustrated Guide* (Cooper, Johnson & Dauncey, 2003). Schedule 9 (Part 2) of the Wildlife and Countryside Act, 1981 (as amended) includes a list of invasive plants, including aquatic species, that should be avoided. Other species may also have a negative affect on native habitats if planted in the wrong location.

Tree

Cherry *Prunus* spp., *P. avium* (wild cherry), *P. padus* (bird cherry), *P. domestica* (domestic plum) N or *P. cerasifera* (cherry plum) E

Ash *Fraxinus excelsior* N

Apple *Malus* spp., *M. domestica* (edible apple), *M. sylvestris* (crab apple) N

Pear *Pyrus* spp., *P. communis* (edible pear) or *P. calleryana* (callery pear) E

Small-leaved lime *Tilia cordata* N

Silver birch *Betula pendula* N

Yew *Taxus baccata* N

Foxglove tree *Paulownia tomentosa* E

Lacebarks *Hoheria* spp., *H. glabrata*, *H. lyallii* E

Tulip tree *Liriodendron tulipifera* E

Beech *Fagus sylvatica* N

Large Shrubs

Hedge veronica/Hebe *Veronica* spp. E

Hawthorn *Crataegus monogyna* N

Blackthorn *Prunus spinosa* N N.B. can produce suckering growth.

Rose *Rosa canina* (dog rose) *R. arvensis* (field rose) *R. pimpinellifolia* (burnet rose) N N.B. *R. rugosa* (Japanese Rose) is a Schedule 9 invasive plant species

California lilac *Ceanothus* spp., *C. arborea* E

Wild privet *Ligustrum vulgare* N

Common holly *Ilex aquifolium* N N.B. both male and female plants are needed for berry production unless a self-fertile variety such as 'J C Van Tol' is used.

Barberry *Berberis* spp. *B. darwinii*, *B. thunbergii*, *B. x stenophylla* E

Daisy Bush *Olearia* spp., *O. x hastii*, *O. macrodonta* and *O. traversii* E

Firethorn *Pyracantha coccinea* E
 Hazel *Corylus avellana* N *C. maxima* E
 Viburnum *Viburnum* spp., *V. lantana* (wayfaring tree) N, *V. opulus* (guelder rose) N, *V. tinus* (laurustinus) E Note: *V. lantana* can become invasive in more open habitats such as chalk grassland.
 Butterfly bush *Buddleja* spp., *B. alternifolia*, *B. globosa* E Note: *B. davidii* should be avoided as can become invasive in more open habitats.
 Dogwood *Cornus sanguinea* N
 Broom *Cytisus scoparius* N
 Mexican orange bush *Choisya ternata* E
 Portuguese laurel *Prunus lusitanica* E
 Flowering currant *Ribes sanguineum* E
 Escallonia *Escallonia macrantha* E cultivar '*Langleyensis*' is a hardier version
 Hardy fuchsia *Fuchsia magellanica* E
 Buckthorn *Rhamnus cathartica* N
 Spindle *Euonymus europaeus* N
 Tutsan *Hypericum androsaemum* N
 Yew *Taxus baccata* N

N.B. Some of these shrub species will form small trees when mature and/or can be trained (along with climbers) to create living walls.

Herbaceous perennials and small shrubs

Tree mallow *Lavatera* spp. *L. arborea* N, or *L. olblio*, *L. thuringiaca* E
 Ice plant *Sedum spectabile* E
 Lavender *Lavandula* spp., *L. angustifolia*, *L. x intermedia* E
 Globe thistle *Echinops ritro* E
 Foxglove *Digitalis purpurea** N or *D. lutea*, *D. x mertonensis* E
 Michaelmas Daisy *Aster novi-belgii* E
 Sunflowers *Helianthus annuus*** E
 Red valerian *Centranthus rubra* E
 Hemp agrimony *Eupatoria cannabinum* N
 Common knapweed *Centaurea nigra* N
 Black-eyed susan *Rudbeckia* spp., *R. hirta*** or *R. fulgida* E
 Rosemary *Rosmarinus officinalis* E
 Rock rose *Cistus* spp. E
 Shrubby cinquefoil *Potentilla fruticosa* N
 Oregon grapes Mahonia spp. *M. aquifolium*, *M. japonica*, *M x media* E. N.B. some species are stoloniferous and can spread.

Climbers

Star jasmine *Trachelospermum jasminoides* E
 Jasmine *Jasminum* spp., *J. officinale* (summer jasmine) *J. nodiflorum* (winter jasmine) E
 Ivy *Hedera helix* N
 Climbing hydrangea *Hydrangea anomala* ssp. *petiolaris* E

Boston ivy *P. tricuspidata* E N.B. a similar species *P. quinquefolia* (Virginia creeper) is a Schedule 9 invasive plant species

Honeysuckle *Lonicera* spp. *L. periclymenum* N or *L. japonica*, *L. fragrantissima*, *L. standishii* E

Clematis *Clematis* spp., *C. vitalba* N or *C. armandii*, *C. alpina*, *C. montana*, *C. tangutica* E

Hop *Humulus lupulus* N

Firethorn *Pyracantha atalantioides* E

Nasturtium *Tropaeolum majus*** E

Bulbs

English bluebell *Hyacinthoides non-scripta* N.B. Spanish bluebell *Hyacinthoides hispanica* is not recommended as it can escape from gardens and out-compete and hybridise with the UK native species.

Squill species *Scilla* spp. N/E

Snowdrop *Galanthus nivalis* N

Winter aconite *Eranthis hyemalis* E

Grape hyacinth *Muscari neglectum* N *M. armeniacum*, *M. comosum* E

Glory-of-the-snows *Chinodoxa* spp. E

Crocus species *Crocus* spp. *C. nudiflorus* (autumn crocus), *C. tommasinianus* (early crocus), *C. vernus* (spring crocus) E

Wild Daffodil *Narcissus pseudonarcissus* N

Onion species *Alliums* spp. *A. ursinum* (ransoms) N or *A. giganteum* (giant onion) E. N.B. *A. triquetrum* (three cornered leek) and *Allium paradoxum* (few-flowered leek) are Schedule 9 invasive plant species.

Wood anemone *Anemone nemorosa* N

Lesser celandine *Ficaria verna* N N.B. can spread, particularly ssp. *verna* (syn. ssp. *bulbilifer*)

Submerged Aquatics (acting as oxygenators)

Water crowfoot *Ranunculus aquatilis*

Spiked water milfoil *Myriophyllum spicatum* N.B. a similar species *Myriophyllum aquaticum* (parrot's feather) is a Schedule 9 invasive plant species

Water starwort *Callitriche stagnalis*

Rigid hornwort *Ceratophyllum demersum*

Curly pondweed *Potamogeton crispus*

Floating Aquatics

Yellow water lily *Nuphar lutea* (can require control)

White water lily *Nymphaea alba* (can require control)

Fringed water lily *Nymphoides peltata*

Bog-bean *Menyanthes trifoliata*

Amphibious bistort *Polygonum amphibium*

Marginal

Yellow iris *Iris pseudacorus*

Water mint *Mentha aquatica*

Water plantain *Alisma plantago-aquatica*
Arrowhead *Sagittaria sagittifolia*
Brooklime *Veronica beccabunga*
Water forget-me-not *Myosotis scorpioides*
Lesser spearwort *Ranunculus flammula*
Lesser reedmace *Typha angustifolia*
Flowering rush *Butomus umbellatus*
Branched bur-reed *Sparganium erectum*
Purple loosestrife *Lythrum salicaria*
Floating sweet-grass *Glyceria fluitans* (grass)
Reed sweet-grass *Glyceria maxima* (grass)
Reed canary grass *Phalaris arundinacea* (grass)

Marshy/damp grassland

Bugle *Ajuga reptans*
Creeping Jenny *Lysimachia nummularia*
Lady's smock *Cardamine pratensis*
Ragged robin *Lychnis flos-cuculi*
Marsh marigold *Caltha palustris*
Meadow sweet *Filipendula ulmaria*
Meadow buttercup *Ranunculus acris*
Marsh woundwort *Stachys palustris*
Hemp agrimony *Eupatorium cannabinum* N.B. can dominate large areas
Rush species *Juncus* spp.

Plants to avoid in smaller ponds

Greater reedmace *Typha latifolia* (large area required)
Common reed *Phragmites australis* (large area required)
Greater spearwort *Ranunculus lingua* (spreads quickly)



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