eDNA water body testing for Great Crested Newt & Reasonable Avoidance Measures

Cresswell Ford Farm,

Dilhorne Lane, Caverswall,
Stoke-on-Trent, ST10 2PH

JULY 2016

eDNA water body testing for Great Crested Newt & Reasonable Avoidance Measures

Client Details:
Mrs. Ann Wagstaff

Application area:
Cresswell Ford Farm, Caverswall.

Postcode/ OS Grid Ref:
ST10 2PH / SJ 961429

Issue No:
Final Issue 1

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Author:
Mark Weston BSc, GradCIEEM, AMRSB

Checked by:

Principal Ecologist

eDNA water body testing for Great Crested Newt
& Reasonable Avoidance Measures

CONTENTS

1. INTRODUCTION

1.1 This supporting document has been prepared on behalf of Mrs. Anne Wagstaff, in relation to a proposed planning application at Cresswell Ford Farm, Dilhorne Lane, Caverswall, Stoke-on-Trent, ST10 2PH. [Grid ref: SJ 961429].

1.2 This document supports and extends on recommendations outlined in the initial Extended Phase 1/ Preliminary Ecological Appraisal undertaken by Charnia Ecology in August 2015, and considers eDNA water body testing for Great Crested Newt and Reasonable Avoidance Measures (RAMs) for all amphibians.

2. SITE DESCRIPTION

Figure 1. Location of proposed development area (arrow) in context to the wider landscape.

2.1 The proposed application area is located in Green Belt, near to the small village of Caverswall, which is largely contained within Area 64 Potteries and Churnet Special Landscape Area. The site is accessed off Dilhorne Lane, and considers the development of a former two storey and single storey barn-building with a pre-fabricated lean-to section.

2.2 There are a number of standing water-bodies immediately adjacent to the east and western boundaries of the proposed application area, with good connectivity to the wider landscape, which comprises of the open agricultural farmland and a number of additional water-bodies and intermittent blocks of ancient woodland.

3. PROPOSED APPLICATION

3.1 The proposed planning application is for a new access from Dilhorne Lane / Caverswall Road (see red line on Fig.2 below).

Figure 2. Location of proposed development (yellow), boundary area (blue) and proposed access track (red).

4. BACKGROUND INFORMATION

4.1 Following the initial Extended Phase 1 survey in 2015, assessment considered the application area as having low potential for Great Crested Newt. This rationale was based on a small development with **NO** standing water-bodies present within the proposed application area itself, and no alteration to existing ponds predicted.

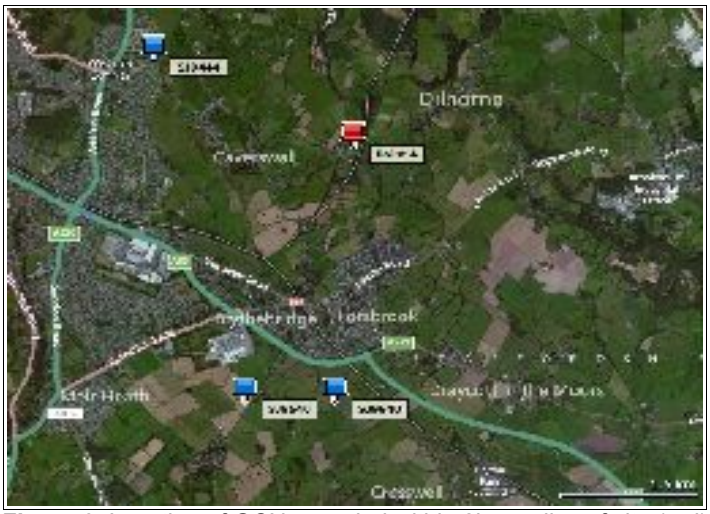

Figure 3. Location of GCN recorded within 2km radius of site (red)

4.2 There are twelve standing water-bodies recorded in a 500m radius, with six permanent pools recorded in a 250m radius of the site. Four of these water-bodies are located immediately adjacent to north, east and south boundaries onsite. These four pools are interconnected by a stream overflow channel from the top tier pool).

4.3 Based on a small scale development (ca 118m^2 [0.0118ha]), any ponds located primarily in 250m radius (and 500m radius thereafter) were initially assessed on their suitability of supporting newt populations using the Habitat Suitability Index HSI (Oldham *et al.* 2000).

4.4 Whilst the majority of ponds were assessed as having good habitat suitability on individual merits of pond area size, permanence, macrophyte coverage and water quality; overall HSI scored the nearest ponds as being below average to average for sustaining GCN populations (based on predatory fish (including large koi carp and tench) and wildfowl (Canada Geese, Kingfisher and a number of Grey heron recorded).

4.5 With regard to terrestrial habitat for GCN, the application area itself comprises of bare substrate ground, underlain with hardcore and stone ballast aggregate; resulting in shallow, stoney soil and ephemeral patches of perennial grass and tall ruderal herbs. This was seen to be subject to varying degrees of disturbance through land management, and intensified further by additional grazing from wildfowl. In its current state the majority of this area was considered as having relatively low ecological value and limited refugia for amphibians, with more preferable terrestrial habitat in the wider landscape considered.

4.6 Applying the more conservative distance of 250m from the proposed working area, Natural England's rapid risk assessment (2011) calculates low risk potential of causing an offence, with no significant adverse impact on Great Crested newt predicted (see appendices). Subsequently Reasonable Avoidance Measures were considered appropriate to minimize any inadvertent impact on such species during development.

5. PRE SURVEY DATA

5.1 Staffordshire Ecological data provides only four individual records of Great Crested Newt 1978-1984 in a 2km search radius, with the nearest sighting 2333m due North-west (1984). There are **NO** breeding ponds recorded within a 500m search radius of the site.

- *Designated sites*

5.2 The application area is contained by **Area Green Belt 64 Potteries and Churnet Valley & Special Landscape Area**. There are No Statutory Nature Reserves, RIGS, SSSIs, SPAs recorded within the area. Cresswellford Crossing which is a Biodiversity Alert Site (BAS) resides immediately to the eastern boundary of the proposed application area (see appendices).

6. LEGISLATION

6.1 Great Crested Newts receive full protection under the European Council Directive of 12 May 1992 on the conservation of natural habitats and of wild fauna and flora (known as the Habitats Directive 1992), the Conservation of Habitats and Species Regulations 2010 and under the Wildlife & Countryside Act 1981 (as amended). Great Crested Newt is a UK BAP Priority Species. (JNCC, 2015).

6.2 This prohibits the intentional killing. injuring or taking (capture. etc.); possession; intentional disturbance whilst occupying a 'place used for shelter or protection' and destruction of these places; sale, barter. exchange. transporting for sale and advertising to sell or to buy.

6.3 The remaining four widespread species of amphibian; the smooth and palmate newts, the common frog and common toad, are also protected only by Section 9(5) of the Wildlife and Countryside Act 1981. This section prohibits sale, barter, exchange, transporting for sale and advertising to sell or to buy. Collection and keeping of these widespread amphibian species is not an offense. Common Toad *Bufo bufo* are afforded UK BAP species protection.

7. ENVIRONMENTAL DNA (eDNA) DETECTION OF GREAT CRESTED NEWTS

7.1 To provide greater confidence in an assessment of likely absence of Great crested newt, eDNA water sampling of the two main water-bodies (Fig.4: P1 & P3) closest to the proposed development were undertaken on 6th June 2016.

7.2 Great crested newt DNA is released into aquatic environments through shed skin cells, urine, faeces and saliva. It can persist in water for several weeks, and has been found to be an effective way to determine presence or absence of newt. eDNA can only be sampled between 15 April and 30 June.

7.3 Water samples were collected by a licensed consultant ecologist (Class licence registration number: 2015-18995-CLS-CLS) in accordance with the DEFRA guidance set out in Analytical and methodological development for improved surveillance of Great Crested Newt (WC1067, Appendix 5) (Biggs *et al*., 2014).

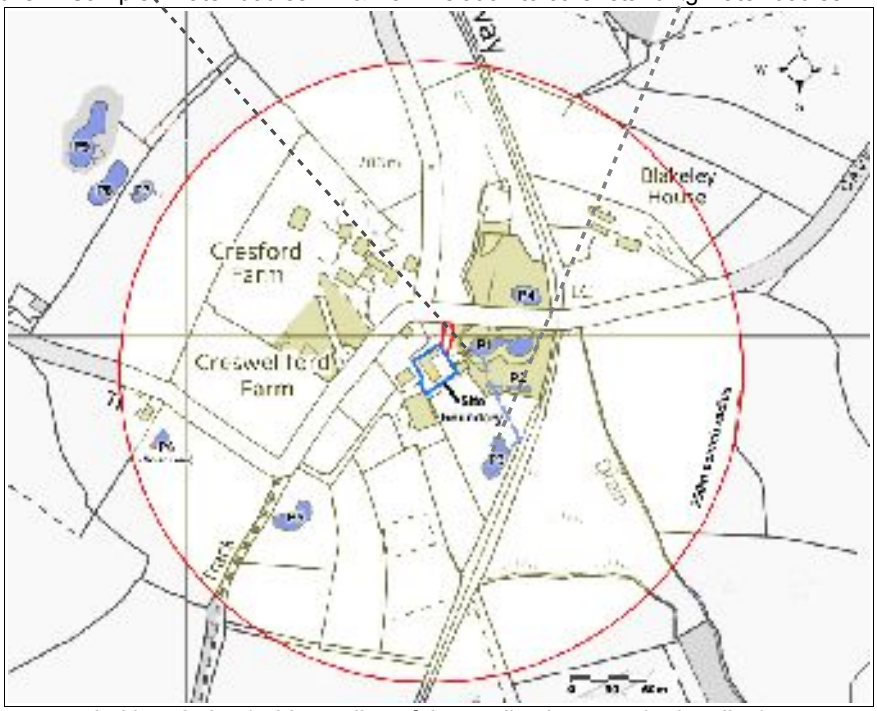

Figure 4. Sampled water-bodies P1 & P3 in relation to other standing water-bodies recorded in a 250m / 500m radius of the application area (red outline).

Results

7.4 The sampling kits were provided by SureScreen Scientifics, and analyzed through qPCR eDNA testing in accordance to the Technical advice note for field and laboratory sampling of Great Crested Newt environmental DNA (Biggs *et al*., 2014).

7.5 PCR amplification of collected water samples return a **negative** result of trace Great crested newt DNA in both ponds sampled:

01886 Charnia Ecology

SureScreen Scientifics

Technical Report
Confidential

Results

Lab Ref	Sample	Co-Ordinates	Inhibition Check	Sample integrity	Result
22547	CW 1 Pond 1	-	Acceptable	Acceptable	**Negative**
22548	CW 2 Pond 2	-	Acceptable	Acceptable	**Negative**

Advice

Negative results may not indicate the absence of GCN just the presence of eDNA below the detection limits of the method. However this method is extremely sensitive. It is still advised to survey a pond using traditional methods within 2km of a positive result or a known habitat for GCN.

Positive results may be true positives but also may be due to contamination of samples from another pond or improper sampling technique. Please ensure traditional surveys are performed on positive ponds and care is taken to avoid spreading GCN DNA.

Samples undergo integrity scores to check for degradation post sampling. Samples which are not acceptable should be re-sampled. Sample integrity scores are based on the amount of degradation of an artificial DNA marker placed in the kits and analysed by qPCR

PCR inhibitors can cause false results. Every effort is made to clean the sample pre analysis however some inhibitors cannot be extracted. An unacceptable inhibition check will cause an indeterminate sample and must be sampled again.

Analysed and reported By: **Derry Hickman**

Checked and approved: **Sam Humphrey**

8. REASONABLE AVOIDANCE MEASURES (RAMs)

8.1 Based on overall assessment supported by eDNA results, best practice guidelines dictate a precautionary approach during development regarding amphibians in general as well as any other terrestrial based species (i.e. small mammals). The following Non licensable Reasonable Avoidance Measures are therefore recommended:

- **Pre-works** (*Induction and Works requiring onsite supervision are denoted in yellow).

1. Wildlife fencing	
 **Figure 5.** Approximate siting of wildlife fencing around work boundaries (red).	
A)	**Erection of general wildlife fencing:** This is intended to holistically deter/exclude and minimize impact on amphibian populations in general, and any other terrestrial based animals that may migrate onto site during the period prior to works commencing. Such fencing will also enable any species interned within the application area to be safely corralled during site preparation, and ushered out under their own volition into receptor areas of Cresswellford Crossing SBI, on the SE oundaries.
B)	**Site induction:** As part of the site induction process, all staff working on site will be made aware of the potential presence of amphibians within the immediate landscape, and will be instructed on their legislative status and protection. A copy of this RAM document including Illustrations of Great Crested Newt and all reptile species should be displayed in the site office at all times for immediate reference (see Appendix).
C)	All contractors will made aware that is an offence to handle GCN, and in the unlikely event that these animals are discovered on site at any time outside supervision periods, then all work must halt and the ecological clerk of works should be contacted.
D)	Where supervision by a suitably qualified ecologist is not deemed necessary; contractors working in the development area should be briefed on the following protocol in the event a reptile is found during works: • Halt work. • Capture reptile using gloves. • Place in container provided and store in the site office. • Contact appointed ecological consultant to transfer reptiles found to a safe receptor site and to seek confirmation that work can continue.
IMPORTANT: In the unlikely event that any individual Great Crested Newt (or any other notable terrestrial species i.e. reptiles) are found during the development, then all works must cease immediately and advice sought from the ecological clerk of works onsite.	

- **Developmental stage**

2. TIMING OF WORKS	
E)	All works to prepare the land onsite for development should ideally be undertaken during the spring/summer season (April to mid June) when GCN reside in-and-around aquatic habitat to breed, and outside the hibernation period (avoiding November to February, inclusive).
3. GROUND CLEARANCE/ ONSITE SUPERVISION	
F)	For the initial stages of the development, the proposed application area should be made to be less desirable for species up-take. Soil stripping should be carried out under the supervision of an ecologist holding a Natural England Great Crested Newt Survey Licence.
G)	Any clearance of ground vegetation, rubble, logs, bricks, other loose materials should encompass a finger-tip search around all potential refugia, in a careful and controlled manner, with constant vigilance for any sheltering amphibians.
H)	If piles of rubble, logs, bricks, other loose materials or other possible amphibian refuge sites are to be disturbed, this should be done by hand
I)	Clearance of the proposed works area should progress in a systematic fashion from North to South, in-order that any amphibians can be corralled out towards favourable terrestrial habitat.
4. WORK PROTOCOL	
J)	Care should be taken that all works, plant and materials remain on existing open areas of hard-standing; avoiding the surrounding boundaries and woodland margins.
K)	All building materials, rubble, bricks and soil should be stored only within existing areas of hard-standing and should be raised above ground level using either pallets, skips, or other suitable containers in order to prevent amphibians and/or reptiles from seeking refuge underneath them. Waste materials should be removed from site immediately or contained within skips.
L)	Where possible trenches should be excavated and closed in the same day to prevent any wildlife becoming trapped. If it is necessary to leave a trench open overnight then it should be sealed with a close-fitting plywood cover or a means of escape should be provided in the form of a shallow sloping earth ramp, sloped board or plank.
M)	All open trenches and pipework should be inspected at the start of each working day to ensure no animal is trapped.

- **Post development stage** (*Induction and Works requiring onsite supervision are denoted in yellow).

5. BUFFER ZONES	
N)	It is recommended that edge-of-field, vegetative buffer strips are retained around hard boundaries if possible, in-order to reduce detrimental edge effects, and increase migration potential around the site for terrestrial based wildlife.
6. RECEPTOR SITE	
O)	In the unlikely event that amphibians (and any other terrestrial based species i.e. small mammals) are present onsite, mitigation may involve capture and translocating species to a site safe-guard area. The nominated receptor site will be Cresswellford Crossing SBI on the SE boundary.
7. LIGHTING	
P)	Any lighting design around the new development should consider potential light-spill, which can affect the foraging and commuting strategy of species (crepuscular and nocturnal species particularly), and should be avoided onto nearby trees and hedges/shrubs. Low-level Lighting should be considered and placed faced down to minimize any such spillage. Should lighting be necessary at elevation, then lighting columns should not exceed eight metres in height. Low pressure sodium lamps (SOX) fitted with hoods are recommended to direct light below the horizontal plane to minimize upward light-spill. Any security lighting should be on a timer setting,and all lighting should not exceed 200 lumens (150 watts).

8. HABITAT ENHANCEMENT	
Q)	It is recommended that any soft landscaping around the proposed residential development should contain appropriate native tree and shrub species to further reduce the visual impact of the development and to enable the prospects of greater biodiversity into the surrounding landscape. No plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 should be planted during the landscaping of this development. For further details of Schedule 9 plants visit the Defra website:www.defra.gov.uk/wildlife-pets/non-native.
R)	It is recommended that any new garden planting should aim to provide cover for great crested newts and other amphibians. Any new planting should aim to provide ground cover and so low-growing shrubs and herbaceous plants cover should be favoured. Native species such as bugle, ivy and periwinkle could be used for this purpose, or ornamental species such as lady's mantle, elephant's ears or perennial geraniums may also be suitable. A diversity of structure should be encouraged through the planting of small trees, dense shrubs & herbaceous plants.
S)	Dead wood habitats should be integrated within the application along the boundary ecotone where possible.

9. REFERENCES

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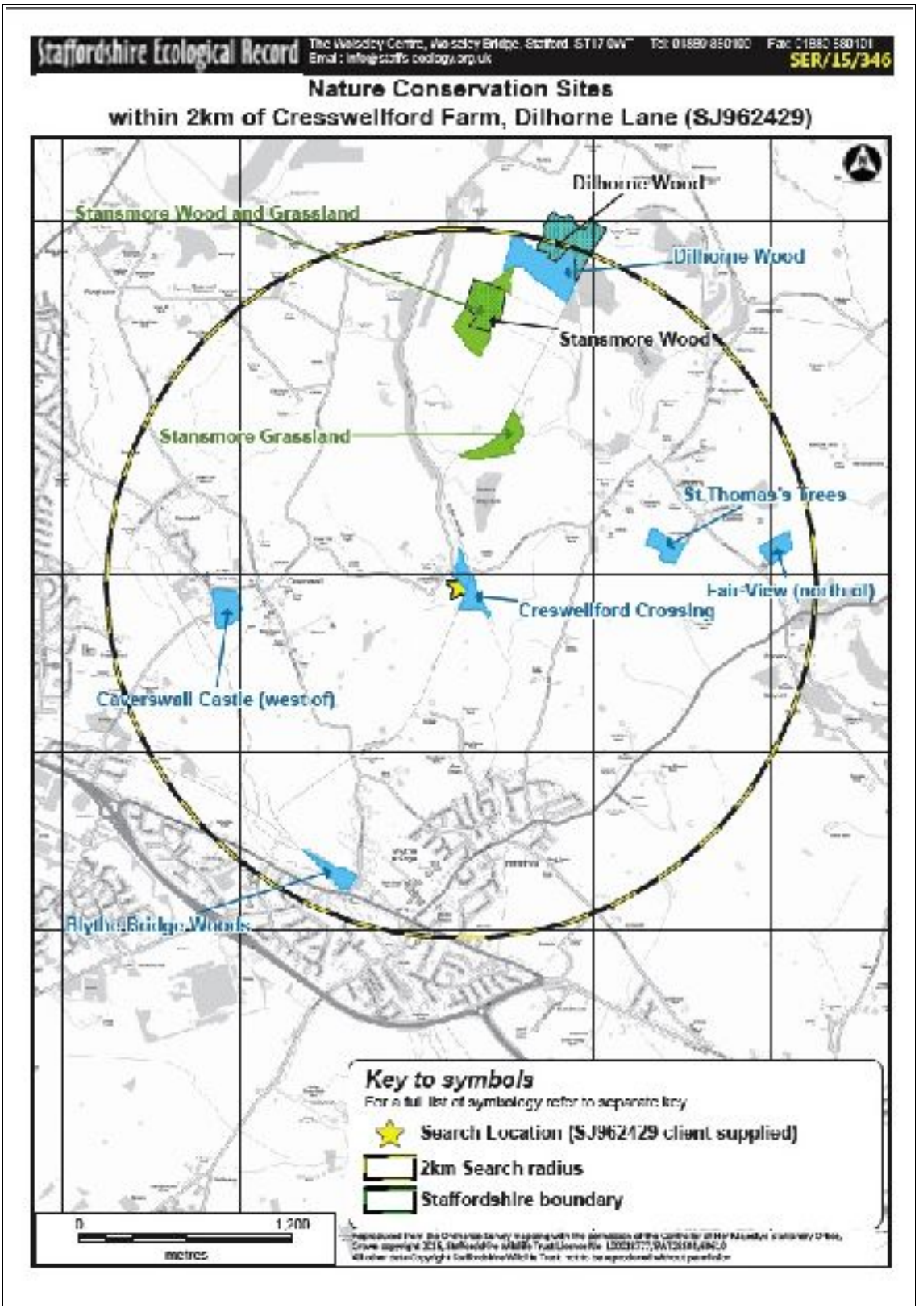
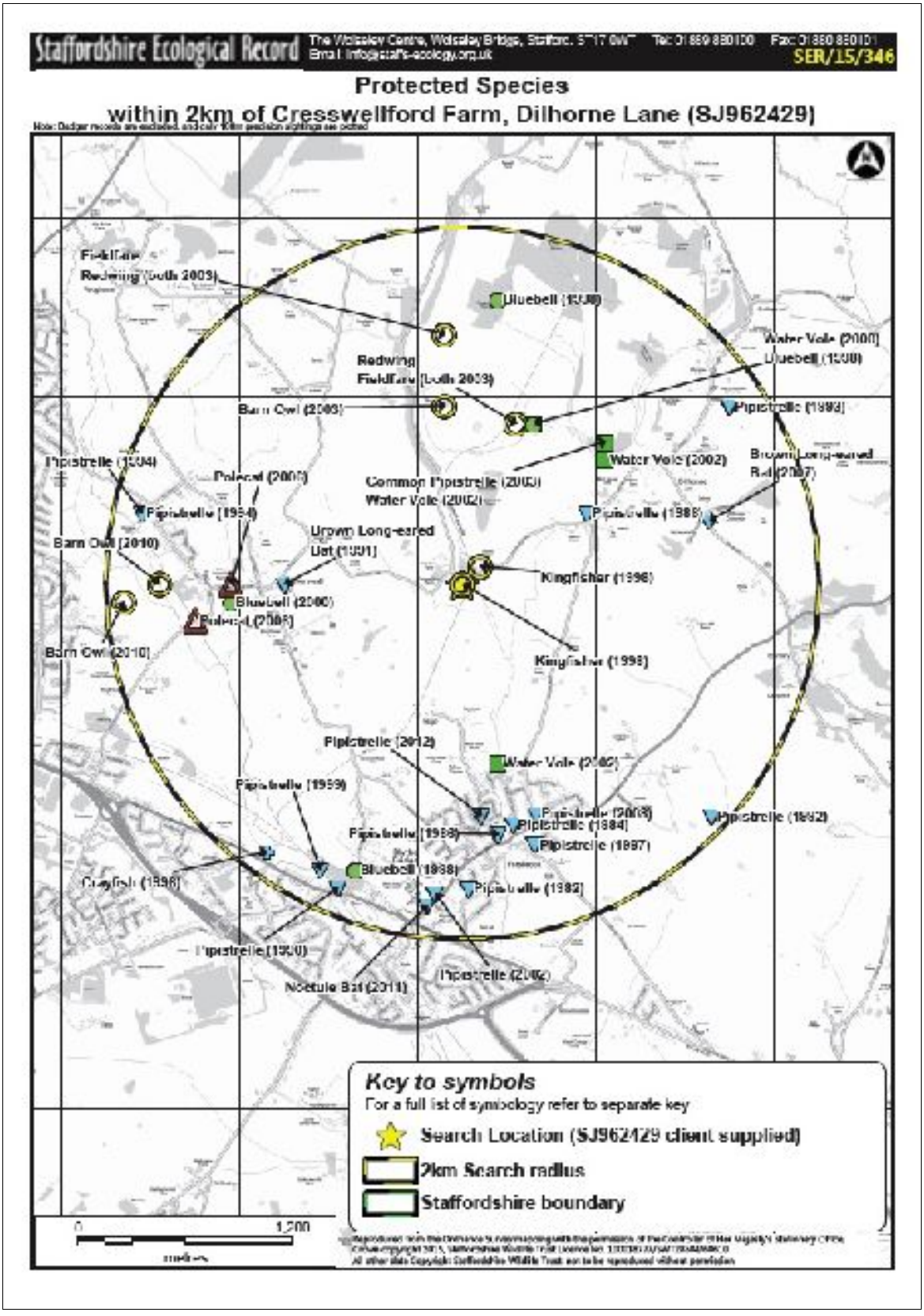
11. APPENDICES

APPENDIX 1: Extended Phase 1 Habitat Map




Staffordshire Ecological Record
SER/15/346
Protected Species
within 2km of Cresswellford Farm, Dilhorne Lane (SJ962429)
Redwing
FieldFare (Lulls 2009)
Bluebell (1998)
Water Vole (2002)
Barn Owl (2010)
Pipistrelle (1994)
Polecat (2007)
Common Pipistrelle (2003)
Water Vole (2002)
Brown Long-eared Bat (2007)
Pipistrelle (1988)
Brown Long-eared Bat (1991)
Kingfisher (1998)
Bluebell (2000)
Polecat (2008)
Kingfisher (1998)
Pipistrelle (2012)
Water Vole (2002)
Pipistrelle (1999)
Pipistrelle (2003)
Pipistrelle (1994)
Pipistrelle (1997)
Pipistrelle (1992)
Pipistrelle (1988)
Bluebell (1998)
Crayfish (1998)
Pipistrelle (1982)
Pipistrelle (1990)
Pipistrelle (2006)
Noctule Bat (2011)
Key to symbols
For a full list of symbology refer to separate key
Search Location (SJ962429 client supplied)
2km Search radius
Staffordshire boundary
0
1,000
metres

- **Table 1. Designated conservation sites**

Statutory Sites (SSSIs/LNRs)

None known within the search area

Non-statutory Ecological Sites (SBIs/BASs)

94/63/30	SJ963430	Creswellford Crossing	BAS (1998)
94/63/68	SJ966438	Stansmore Grassland	SBI (2005)
94/64/45	SJ964445	Stansmore Wood and Grassland	SBI (2005)
94/64/98	SJ969448	Dilhorne Wood	BAS (1998)
94/65/45	SJ964455	Haywood Grange Wood	BAS (2000)
94/73/42	SJ974432	St Thomas's Trees	BAS (2000)
94/74/39	SJ973449	Foxfield & Peacraft Woods	SBI (1998)
94/82/91	SJ988421	Commonside Quarry	BAS (2000)
94/83/12	SJ981432	Fair View (north of)	BAS (2000)

Site on the Natural England Ancient Woodland Inventory (AWI)

SJ968448	Dilhorne Wood	Ancient & Semi Natural Woodland
SJ974448	Foxfield Wood	Ancient & Semi Natural Woodland
SJ964455	Grangewood	Ancient & Semi Natural Woodland
SJ963445	Stansmore Wood	Ancient & Semi Natural Woodland

Regionally Important Geological/geomorphological Sites (RIGS)

None known within the search area

3) Protected Species within search area

An annotated list of all Internationally and UK protected species together with species from the UK and Staffordshire Biodiversity Action Plans is attached.

Staffordshire Ecological Record

Ecological Site Report

Staffordshire Ecological Record

Produced by GeoConservation © SLIL 1998 - 2002

Administrative Areas based on the National Biodiversity Network Dictionary © NBN 1999-2002

Site Key: 94/63/30 **Site Type:** Wet woodland (P)

Site Name: Creswellford Crossing

Grid Ref: SJ963430

Civil Parish Dilhorne, Staffordshire Moorlands, Staffordshire, England

GB Vice-County Staffordshire,

Keywords

Keyword	Details	Date
Local Site Status		
Biodiversity Alert Site		18/8/98
unrecognised local keywords		
Original Recorder Code	250099	no date

Site Designation Criteria

General 18/8/98 Chair of Designation: Hill, Mr Roger N.

Designation Cmttee: GW, AL, SL

Biotopes (Habitats)

Code	Habitat	Area (ha)
A111	Woodland: broadleaved, semi-natural	1.60
A21	Scrub: dense/continuous	0.70
B22	Grassland: neutral, semi improved	0.10
B5	Grassland: marsh/marshy grassland	0.10
C31	Tall herb and fern: other, tall ruderal	0.10
G1	Open water: standing water	0.10

Dimensions

Dimension	Value/units
area	2.7ha

Contacts

field surveyor	6/6/98	Rimmer, Shaun D.
landowner, previous	1998	Nicholls, A.

Site Description

Source: ***Rimmer, 6/6/98***

Summary: The site is separated into three areas by the Caverswall road and a disused mineral rail line. The compartments are all surrounded by semi-improved grassland and are located 3/4 of a mile northeast of the village of Caverswall.

Northwest Section

This compartment is represented by areas of marshy grassland, willow carr and tall ruderal vegetation. Numerous ditches which flow through the area have made sections very wet under foot.

Occasional mature alders are present within this section of the site, though most are located on the periphery of the compartment. The main area of willow carr is located in the southern 1/3 of the compartment, it is dominated by grey willow, though goat willows are occasionally found. Common nettles thrive beneath the willows and make access to this section very difficult, their dominance highlights the high nutrient content of the soil. Despite the dominance of the nettles some wetland herbs are still abundant along the numerous ditches which are present in this small wet section of carr including large bittercress, opposite-leaved golden saxifrage, creeping buttercup and wavy bittercress. Bramble, hedge woundwort, red campion, goosegrass and hogweed are also present though on the drier edges of the carr. The central area of the compartment becomes dominated by bramble, common nettle and rosebay willowherb. This section is very open, mature alder, silver birch and holly border this area of ruderal species. The northern third of the compartment becomes much wetter again with numerous ditches and flushes present, occasional mature alders are found here. Common nettle, fool's watercress, soft rush and rough meadow-grass cover the majority of the ground layer, soft rush and fool s watercress are especially abundant along a broad area of wet ground which dominates this part of the compartment. Common valerian is found frequently in the wetter areas along with great willowherb, herb robert and creeping soft grass.

This compartment of the site seems to be retaining much of it's ground water.

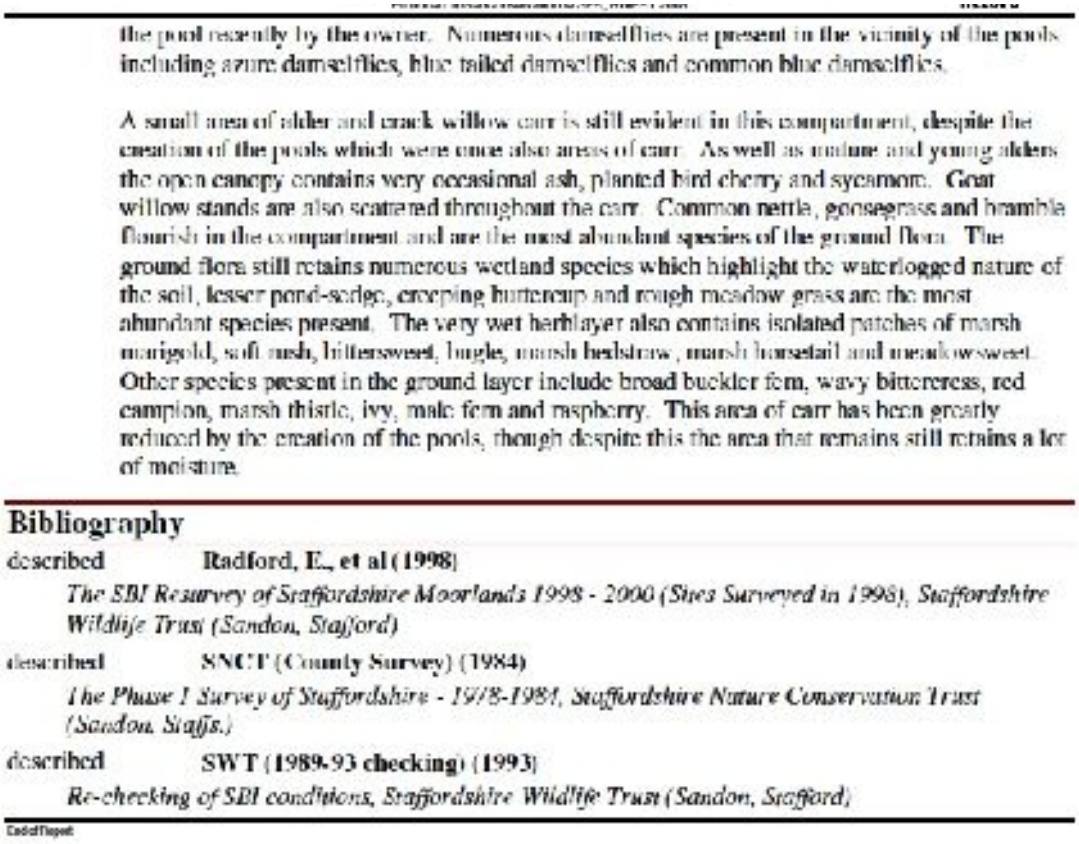
Southeast Section.

The majority of this compartment is dominated by goat willow carr, numerous mature crack willow stands are present on the periphery of the compartment along with occasional silver birch and alder. Elder and planted bird cherry are present amongst the dense willows in the northern half of the compartment. The southern half is quite dry under foot and is species poor, common nettle dominates the ground flora here. The remainder of the ground flora contains a diverse array of wetland species including lesser pond sedge and meadowsweet which are abundant in localized areas. Other species present in the wetter areas of the ground layer include bog stitchwort, creeping buttercup, tufted hair-grass, marsh bedstraw, wavy bittercress and marsh thistle. Large bittercress, wavy bittercress and bugle are the predominant herbs in the northern section of willow carr, which is still very wet underfoot.

Southwest Section.

Two pools have been created in the section on the site of the old water mill which was present in the 1900's. An area of alder carr still exists though it only occupies the eastern half of the compartment.

The banks of the two pools have been planted with a wide variety of wetland plants, emergent species include reedmace and yellow iris which occur occasionally of the fringes of the pools. The planted banks of the pools also contain soft rush, butterbur, water figwort, ground elder, greater bird's-foot-trefoil, reed sweet-grass, brooklime, opposite-leaved golden-saxifrage and greater willowherb. An introduced species of water plantain is evident on a small area of the water surface. The larger pool is raked regularly by the owner though some aquatic weed species are left by the owner to encourage wildlife. Numerous water fowl use the pools including canadian geese and their six young, apple yards and moorhens. The



the pool recently by the owner. Numerous damselflies are present in the vicinity of the pools including azure damselflies, blue tailed damselflies and common blue damselflies.

A small area of alder and crack willow carr is still evident in this compartment, despite the creation of the pools which were once also areas of carr. As well as mature and young alders the open canopy contains very occasional ash, planted bird cherry and sycamore. Goat willow stands are also scattered throughout the carr. Common nettle, goosegrass and bramble flourish in the compartment and are the most abundant species of the ground flora. The ground flora still retains numerous wetland species which highlight the waterlogged nature of the soil, lesser pond-sedge, creeping buttercup and rough meadow grass are the most abundant species present. The very wet herblayer also contains isolated patches of marsh marigold, soft rush, bittersweet, bugle, marsh bedstraw, marsh horsetail and meadowsweet. Other species present in the ground layer include broad buckler fern, wavy bittercress, red campion, marsh thistle, ivy, male fern and raspberry. This area of carr has been greatly reduced by the creation of the pools, though despite this the area that remains still retains a lot of moisture.

Bibliography

described **Radford, E., et al (1998)**

The SBI Resurvey of Staffordshire Moorlands 1998 - 2000 (Sites Surveyed in 1998), Staffordshire Wildlife Trust (Sandon, Stafford)

described **SNCT (County Survey) (1984)**

The Phase 1 Survey of Staffordshire - 1978-1984, Staffordshire Nature Conservation Trust (Sandon, Staffs.)

described **SWT (1989-93 checking) (1993)**

Re-checking of SBI conditions, Staffordshire Wildlife Trust (Sandon, Stafford)

Instructions for completion of Method Statement template
Application tools: (1) "Do I need a licence?" - rapid risk assessment
Caveats and limitations

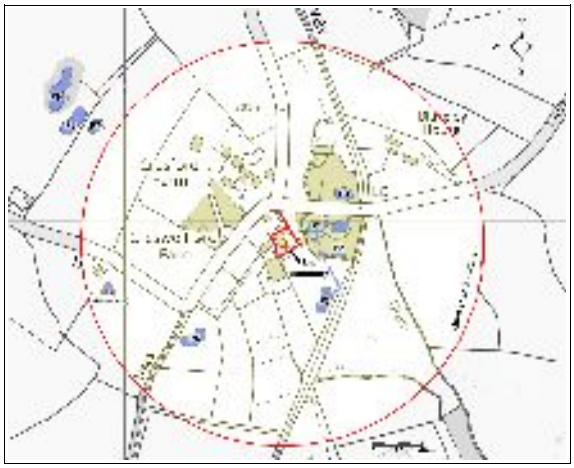
This risk assessment tool has been developed as a general guide only, and it is inevitably rather simplistic. It has been generated by examining where impacts occurred in past mitigation projects, alongside recent research on newt ecology. It is not a substitute for a site-specific risk assessment informed by survey. In particular, the following factors are not included for sake of simplicity, though they will often have an important role in determining whether an offence would occur: population size, terrestrial habitat quality, presence of dispersal barriers, timing and duration of works, detailed layout of development in relation to newt resting and dispersal. The following factors could increase the risk of committing an offence: large population size, high pond density, good terrestrial habitat, low pre-existing habitat fragmentation, large development footprint, long construction period. The following factors could decrease the risk: small population size, low pond density, poor terrestrial habitat, substantial pre-existing dispersal barriers, small development footprint, short construction period. You should bear these mitigating and aggravating factors in mind when considering risk.

Great crested newt breeding pond(s) No effect
Land within 100m of any breeding pond(s) No effect
Land 100-250m from any breeding pond(s) No effect
Land >250m from any breeding pond(s) 0.5 - 1 ha lost or damaged

Rapid risk assessment result: GREEN: OFFENCE HIGHLY UNLIKELY

Guidance on risk assessment result categories "Green: offence highly unlikely" indicates that the development activities are of such a type, scale and location that it is highly unlikely any offence would be committed should the development proceed. Therefore, no licence would be required. However, bearing in mind that this is a generic assessment, you should carefully examine your specific plans to ensure this is a sound conclusion, and take precautions (see Non-licensed avoidance measures tool) to avoid offences if appropriate. It is likely that any residual offences would have negligible impact on conservation status, and enforcement of such breaches is unlikely to be in the public interest.

Habitat Suitability Index assessment of water bodies (TARGET NOTE 4)



HSI		Pond suitability
<0.5	=	poor
0.5 – 0.59	=	below average
0.6 – 0.69	=	average
0.7 – 0.79	=	good
> 0.8	=	excellent

Water-bodies in 250m radius

No.	Notes	HSI	No.	Notes	HSI
1	 1) England 2) 1200m^2 3) Never dries 4) Poor invert popn 5) 50% shading 6) Waterfowl major 7) Fish major 8) 37 ponds on OS 9) Moderate terrestrial habitat 10) 5% macrophytes	0.30	2	 1) England 2) 72m^2 3) Never dries 4) Poor invert popn 5) 100% shading 6) Waterfowl minor 7) Fish – sticklebacks minor 8) 37 ponds on OS 9) Good terrestrial habitat 10) 0% macrophytes	0.45
3	 1) England 2) 120m^2 3) Never dries 4) Moderate invert popn 5) 60% shading 6) Waterfowl minor 7) Fish – sticklebacks minor 8) 37 ponds on OS 9) Good terrestrial habitat 10) 0% macrophytes	0.68	4	 Access constraints 1) England 2) 60m^2 3) Never dries 4) Moderate invert popn 5) 100% shading 6) Waterfowl minor 7) Fish – sticklebacks predicted 8) 37 ponds on OS 9) Good terrestrial habitat 10) 0% macrophytes	0.45

5	 1) England 2) 120m^2 3) Never dries 4) Moderate invert popn 5) 20% shading 6) Waterfowl minor 7) Fish – sticklebacks minor 8) 37 ponds on OS 9) Moderate terrestrial habitat – heavily grazed 10) 30% macrophytes	0.62	**6**	Not assessed / access not gained	-

Water-bodies on the peripheral of 250m radius					
7	 1) England 2) 100m^2 3) Never dries 4) Moderate invert popn 5) 60% shading 6) Waterfowl minor 7) Fish – sticklebacks minor 8) 37 ponds on OS 9) Good terrestrial habitat 10) 0% macrophytes	0.45	**8**	 1) England 2) 100m^2 3) Never dries 4) Moderate invert popn 5) 70% shading 6) Waterfowl minor 7) Fish – sticklebacks minor 8) 37 ponds on OS 9) Good terrestrial habitat 10) 0% macrophytes	0.45
9	 1) England 2) 90m^2 3) Never dries 4) Moderate invert popn 5) 60% shading 6) Waterfowl minor 7) Fish predicted 8) 37 ponds on OS 9) Good terrestrial habitat 10) 0% macrophytes	0.45			

APPENDIX 2: WORK SITE GCN FACT SHEET & LEGISLATION

Common Name: Great Crested Newt
Latin Name:*Tritusus cristatus*
Other names: Warty Newt & GCN

Adult great crested newts are approximately 100mm to 130mm in length. Both sexes have a dark brown warty body and yellowish-orange belly with black blotches.Mature males have a white stripe along the tail.

EU & UK LEGISLATION

Great Crested Newt is a European Protected Species by virtue of being listed under Annex IVa to the EU Habitats and Species Directive 1992.

Under UK law, Great crested newt and their breeding sites or resting places are protected under Regulation 41 of the Conservation of Habitats and Species Regulations 2010 and Section 9 of the Wildlife and Countryside Act 1981.

It is an offence for anyone intentionally to kill, injure or disturb a great crested newt, to possess one (whether live or dead), or sell or offer for sale without a licence. It is also an offence to damage, destroy or obstruct access to any place used by great crested newt for shelter.

In the event that Great Crested Newt may be found during development, then all works must cease immediately until further consultation with the Ecological Clerk of Works is consulted:

Mark Weston BSc (Hons), MCIEEM, AMrSB
Tel: 07881 908 263

AMPHIBIAN IDENTIFICATION SHEET

Smooth newt (*Lissotriton vulgaris*) **Common toad** (*Bufo bufo*) **Palmate newt** (*Lissotriton helveticus*)

Common frog (*Rana temporaria*) **Natterjack toad** (*Epidalea calamita*) **Pool frog** (*Pelophylax lessonae*)

12. LIMITING CONDITIONS / DISCLAIMERS

Services

9.1 This statement has been prepared with all reasonable skill, care and diligence, within the terms of the contract with the client. The actions of the surveyor on site and during the production of the report were undertaken in accordance with the Code of Professional Conduct of the Chartered Institute of Ecology and Environmental Management (www.ieem.org.uk). No part of this document may be reproduced without the prior written approval of:

Mark Weston BSc (Hons) GradCIEEM, AMSB
Charnia Ecology
Foxglove, Cottage
Boundary, Nr. Cheadle
Staffordshire
ST10 2NU.

9.2 Should any part of this report be lost, or altered without the written consent of the author, then the entire report becomes invalid.

9.3 The general format of reports is a certified product and cannot be shown, copied or distributed to third parties without the permission of the author. No liability is accepted for the contents of the report, other than to that of the client(s).

9.4 The report will purport not to express any opinion or comment as to the condition or structural integrity of any building; and no reliance should be made on any such comments other than description regarding suitability of species.

9.5 Every attempt has been made to provide an accurate ecological assessment under the current wildlife legislations at the time of surveying. The author cannot be made accountable for stochastic events over space and time.

9.6 The author remains impartial to any decision making and attempts only to make recommendations in the interests of conserving protected species and biodiversity, whilst acknowledging sustainable development.