PRELIMINARY ECOLOGY

FOR

BROAD ROAD - BACTON - SUFFOLK
IP14 4HP

ON BEHALF OF

PHIL COBBOLD PLANNING

FOR

NAOMI HULL --- TEMPLE PROPERTY LTD

AUGUST 19 TH 2020

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A Member of the Suffolk Bat Group

and C M Vickers BSc Hons

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Contents

Page

1 Instruction / Proposal / Site Location

2 Method / Objective

3 Legislation.

4 Species legal protection

5 Legal Consideration

6 Site description

6 - 8 Field survey

9 Surrounding landmass / impact

10 - 13 Assessment of relevant / regional protected species

14 Summary and Discussion

15 - 17 Recommendations

18 Addendum re recommendations

19 - 30 Explanation of HSI survey

31 - 32 Results and Conclusion

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Proposal : Residential Development Phil Cobbold Planning reference 2370

SITE LOCATION

Broad Road Bacton Suffolk IP14 4HP – TM 060 669

1 METHOD

SITE VISIT - FIELD STUDY

A walk over of the site and surrounding area was made on the 18 th of August 2020 by Tim Watts - an independent, qualified and experienced ecologist.

To establish the possible presence and habitat suitability of protected species within the area of impact. Consideration given to land area of physical development and that of surrounding landmass / pondscape – within viable / relevant distance with regard to particular species mobility / access to any development proposals .

2 OBJECTIVE – LEGISLATION

The objective was to investigate for species which have specific protection within the Wildlife and Countryside Act 1981, European Habitats Directive on Conservation of Natural Habitats of Wild fauna and Flora 1994 and subsequent amendments to Conservation of Habitats and species regulations 2010 (paragraph 98 of circular 06/2005 accompanying PPS9) states ' the presence of a protected species is a material consideration where a development proposal that if carried out would be likely to result in harm to the species or it's habitat' Followed by the Conservation of Habitats and Species regulation 2017 articles 1(b) and 1 (h) of the habitats directive ' Priority Natural Habitat Type' and ' Priority Species' – ENGLANDS'S BIODIVERSITY 2020 : A Strategy for Wildlife and Ecosystem Services.

The threshold above which a person will commit the offence of deliberately disturbing a wild animal of European protected species has been raised. Now, a person will commit an offence if he deliberately disturbs such animals in a way as to be likely significantly to affect (a) the ability of any significant groups of animals of that species to survive,breed or rear or nurture their young, or (b) the local distribution of that species. However it is to be noted that the existing offences under the Wildlife and Countryside Act (1981) as amended which cover obstruction of places used for shelter or protection (for example bat roost-badger set) ,disturbance and sale – still apply to European protected species.

Survey consideration given to:

The Protection of Badgers Act 1992 consolidates previous badger legislation by providing comprehensive protection for badgers and their setts, with requirement that any authorised sett disturbance or destruction be carried out under NE licence.

The European Community Council Directive on the Conservation of Wild Birds (79/409/EEC) sets out general rules for the conservation of all naturally occurring wild birds, their eggs and habitats. It requires a member states to designate Special Protected areas (SPAs) for protection of certain species.

The Survey was carried out with consideration of the Countryside and Rights of Way Act 2000 " Crow Act " and amendments to the species protection measures provided by the Wildlife and Countryside Act 1981. With particular reference to Great crested newts.

The Hedgerows Regulation 1997 aim to protect important hedgerows in the countryside. They make it illegal to remove most countryside hedges without first notifying the local planning authority, and provide protection for ' important hedgerows'. Particular seasonal reference to bird nesting regarding hedgerow management works.

In addition to investigate local species listed in the UK Biodiversity action plan for Suffolk/Essex - 'Species of Conservation Concern' to build up a reliable and responsible picture of localised populations where present.

3 SPECIES OF LEGAL PROTECTION

The species below have particular conservation status as mentioned within both local and European relevance,red/amber listed or covered by general protection within life cycle, migration,or habitat that may be considered and surveyed within an ecology statement.

Species covered by Statutory Instrument – Schedule 2EHD

Great Crested Newt (triturus cristatus)
Otter (lutra lutra)
Bats (all species rhinolophidea and vespertilionidae)
Dormouse (muscardinus avellanarius)

SPECIES COVERED BY LOCAL ACTION PLANS AND WILDLIFE AND COUNTRYSIDE ACT 1981 ---- SPECIALIST CONSERVATION / PRIORITY SPECIES.

Barn Owl (tyto alba)
Water vole (arvicola terrestris)
Hazel Dormouse (muscardinus avellanarius)
Hedgehog (erinaceus europaeus)
Badger (meles meles) covered by the Badgers Act 1992

All amphibians - Great crested, Smooth, and Palmate newts. Common and Natterjack Toad , and Common Frog.

All reptiles.

All wild birds nests and eggs
Specimen and specialist flora

Note and record non Native / invasive alien species such as Japanese knotweed / Signal Crayfish

IMPLICATIONS OF LEGISLATION AND POLICIES

With legal responsibilities and planning implications, it is essential that any ecological assessment of potential development site, including the area of this report,must determine the possible presence or absence of any protected species as part of any planning development consideration. Or make recommendations for further survey work to conclude presence of protected species.

Without this assessment the potential developer would be unable to demonstrate due diligence in his/her responsibilities. Further more the local planning authority would not have been provided with sufficient information for a planning decision to be made. This could result in the application being designated incomplete and not determined,or simply refused.

Where mitigation or compensation measures are required to ensure that no significant impacts will result on biodiversity from the development , the proposed measures may be secured though planning conditions or by EPS Mitigation Licences from Natural England.

4 CONSIDERATION WAS GIVEN TO THE SITES HABITAT SUITABILITY TO LOCAL PROTECTED SPECIES WITH REFERECE TO THE SUFFOLK BIODIVERSITY INFORMATION SERVICE DATA.

CONSIDERATION GIVEN TO AREA OF IMPACT REGADING HABITAT CHANGE AND DISTRUBANCE TO THE LOCAL ENVIRONMENT.

5 SITE DESCRIPT

The site area (foot print of proposed development) is some 12,000 square metres of arable land, presently winter wheat stubble.

The B1113 - Broad Road, Bacton runs immediately down the East side of the area with direct access at the South East corner of the site.

A hard access way for Bacton United Football Club boundarys the south of the proposed development area.

The Club car park and amenity grassland stretch to the West of the site.

The Northern boundary consists of mature trees hedge and gardens of The Oaks.

6. FIELD SURVEY - HABITAT DESCRIPTION.

6.1 There is a wide concreted access point which incorporates a cleared concrete ' pad' agricultural storage area of some 150 square metres on the southwest of the site.

6.2 A raised area of soil / mound which stands north of the pad is colonised with Cow Parsley – anthriscus sylvestris, Creeping Thistle – cirsium arvense, Common nettle – urtica dioica and Greater Burdock -arctium lappa.

6.3 There are extensive earthworks of rabbits on this mound but no evidence of Badger activity.

6.4 A dense and historical hedge line runs along side the road on the East side of the site consisting of Common Hawthorn – cratus monogyna, Field maple – acer campestre, Blackthorn – prunus spinosa, Dogwood – cornus sanguinea, and Bramble – rubus fruiticosus, this managed to a height of 1.7 to 2 metres.

6.5 Beyond the concrete pad and mound an ephemeral ditch line runs to the North, inside the roadside hedge . The ditch and banks have been cleared of vegetation by recent flail hedge cutting.

6.6 The Northern boundary of the site consists of the back drive access of The Oaks property and gardens. These are separated from the site by an established hedge and mature trees of Ash – fraxinus excelsior, Field maple, English Oak - quercus robur, Osier Willow – salix viminalis, Hawthorn, and Horse Chestnut. The mature trees rise to a height of seven to eight metres. There is understory hedge growth of Laburnham – laburum anagyroides, Laurel – prunus laurocerasus and Oval leafed privet – ligustum ouvalifolium.

6.7 A pond and scrub area sits some ten metres from the sites North East corner within the gardens of The Oaks.

6.8 The western boundary of the site consists of post and rail fencing directly to the arable headland of the proposed development area.

6.9 The Northern section of this western boundary is accompanied by scrubby hedging of Field maple, Elder – sambucus nigra, Dogwood, Hazel – corylus avellana and Dog rose – rosa canina and understory growth bramble, creeping thistle, nettle,, Lady's mantle – alchemilla vulgaris, Cock's foot – dactylis glomerata, and Burdock on the raised bank margin of amenity grassland - football field.

6.10 The southern section of this post and rail boundary fencing directly backs onto the Bacton Football Club's car park area.

6.11 The Southern boundary of the proposed development area of arable land backs directly onto the hard access way way to t club house.

6.12 Beyond this access road are the residential gardens of Brickwall Farm and Barns with an established hedge and mature trees screen. The western end consists of a raised bank of occasional mature Hawthorn , standing to a height of some 6/7 metres with low Elder scrub. The hedge line is shielded from the site with rabbit wire.

6.13 The Eastern section of this southern boundary consists of mature Crack and Weeping Willow - salix chrysocoma and fragilis, Ash and Hawthorn.

6.14 Below the mature trees is the remains of what may have been a moat system to Brickwall Farm. It is heavily silted / choked with fallen timber and dry at present.

6.15 The internal area - foot print of development is presently wheat stubble with some evidence of Redshank – persicaria maculosa, Bindweed -convolvulus, Fat hen-chenopodium alba and Mugwort – artemisia vulgaris.

6.16 Electric cables run East / West across the middle of the site , Where they join poles at the roadside hedging has grown to some four metres and a birds nest is present.

6.17 A Public foot path enters the proposed development area North of the concrete pad area.

7 SURROUNDING LANDMASS – SPECIFICALLY IDENTIFIED POND / WETLAND

SEE PROMAP copy in Addendum map and Photographs.

HABITAT POTIENTIAL TO EPS / LPS -- Amphibians specifically Great Crested Newt - GCN

7.1 Continuation of Brickwall Farm and Barns Moat system was investigated and found to contain water to a depth of 150 / 200 mm. No sigh of submersed / mid or floating plant life with marginal plant colonies very poor . Margins of concrete or bramble encroachment ,and heavily shaded.

Full HSI attached and photo file available.

7.2 The Oaks Pond and wetland drainage ditch were investigated. The pond was found to have a resident population of mallard. Pond margins had been stripped of foliage by waterfowl and residence created erosion of banks. Pond 50% shaded and heavily silted. There was no sign of submersed, mid water or floating plants and water contained high densities of daphnia. Outlet / drainage ditch to the west was dry , silted and 100% shaded ten metres from the pond.

Full HSI analysis enclosed.

7.3 Drain / Ditch East of the B1113 was found to run on the immediate roadside. It is enclosed by soft vegetation and presently dry - clearly ephemeral in nature.

Full HSI analysis enclosed.

7.4 Long Meadow Pond was investigated and found to consist of a dry widened drainage ditch, heavily silted and shaded out by neighbouring hedge and garden trees.

Full HSI analysis enclosed.

8 ASCESSMENT / FINDINGS --- PRESENCE AND HABITAT SUITABILITY OF PROTECTED SPECIES

8.1 AMPHIBIANS

There are no ponds or wetlands on the proposed development area. There is no viable terrestrial habitat on the proposed foot print of development suitable for amphibians . Boundary hedge lines / mounds and ditches may have relevance.
There are ponds / wetlands that neighbour the site or within viable distance, these were investigated and surveys carried out regarding their suitability to the species and details are attached - See appendage.

8.2 REPTILES

There is no suitable habitat for reptiles on the proposed development area as no wild unmanaged / habitats are present. Land management of arable farming lacks a stable environment for the species to exist.
Neighbouring gardens and boundary hedge lines provide habitat potential and corridors for movement.
The sites proximity to road and access way create hazard and disturbance of these species.
The site sits within a traditional intensive arable area and generally lacks adjoining wild habitats for reptile merit.
No evidence was found.

8.3 BATS

There are no buildings or trees within the proposed development area that would provide suitable refuge / roost for the species.
Neighbouring mature trees and hedge line edges provide some merit with regard to roost and feeding areas.
The disturbance from neighbouring road ,club car park activity and lighting would be a deterrent to the species residence in the area of proposed development.

8.4 BARN OWLS

The site does not contain buildings or mature trees suitable for barn owls. Habitats on the site do not provide suitable feeding areas.

8.5 BADGERS.

There are extensive earth works in mounds and hedges that surround the site however none could be attributed to badger activity. Wire netting and hedge line undergrowth show no signs of badger penetration.

8.6 HEDGEHOGS

The arable land area provides limited habitat merit to hedgehogs and surrounding hedge line understory is poor due to intensive rabbit grazing.

8.7 OTTERS and WATER VOLES

The site does not contain any suitable wetland habitat for these species.

8.8 HAZEL DOORMOUSE

The site does not contain suitable woodland or connecting corridors that would be relevant to the species

8.9 BIRDS - BIRDS NESTS

The sites boundary hedges and trees provide suitable habitats to both nesting and feeding birds. The roadside hedge is of sufficient structure and density to prevent any works within the bird nest season 1st march - 1 September.

Birds nests are present and it's density would mean any survey would not produce a reliable picture of absence.

8.10 NON NATIVE SPECIES

No non native species were identified on the site.

9 SUMMARY / DISCUSSION.

9.1 The sites footprint of proposed development is on what would be historical intensively farmed arable land (cropping) This where an historic regime of cultivation, spraying and fertilization has denuded the site of a diversity of plant species and wild habitat.

9.2 The site is not connected to any wild habitats for particular merit and in the big picture surrounded by a traditional arable land landscape and residential housing.

9.3 There are adjoining residential garden areas to the North and South of the site that do provide some merits to local protected species. In particular these contain ponds that may be relevant to amphibians which can coexist with human activity (bar road traffic) if viable conditions are provided within these wetland environments.

9.4 For other species such as bats / barn owls intense human activity / noise, machine /road noise, and lighting are a deterrent - and an active sports field area would be avoided.

9.5 The sites periphery of hedges and trees provide both nest sites and feeding areas for local garden bird species and these areas should be protected and enhanced to avoid any future disturbance and loss of habitat.

10 RECOMMENDATIONS

10.1 Full consideration should be given to protecting the Southern and Northern hedge /tree line from illumination of any proposed development lighting.

Design of lighting should lack UV elements. Metal halide and florescent sources should not be used.
Led luminaires should be used where possible due to their sharp cut off , lower intensity, good colour rendition and dimming capability.

A warm white spectrum (ideally < 2700 kelvin) should be adopted to reduce blue light component.

Luminaries should feature peak wavelengths higher than 550 nm to avoid the component of light most likely to disturb bats.

Luminaries should be mounted on the horizontal with no upward lift to avoid light spill which would illuminate neighbouring wild habitats. External lighting can be baffled / hooded to reduce this spill and directed only to where it is required.

10.2 Professional advice should be sort to protect root systems of mature trees on the Northern boundary from excavation works of drains and foundations.

10.3 Additional hedge planting / screening of native species as created to buffer garden habitats to the North and South of the site. To the south hedging should be created North of the Football access way.

10.4 Full consideration should be given to the protection of terrestrial mammals, amphibians and reptiles over any development / building process with following guidance followed.

10.41 Prior to the commencement of works if longer vegetation becomes established on the site , it should be cleared sensitively. If longer than 300mm in height and if animals are readily active (ie early February to October inclusive) management as follows:

10.42 These areas of longer vegetation should be strimmed down to ground level using a two stage cut with the first cut to circa 150 mm. The ground should then be inspected prior to cutting to ground level. If any animals are present they should be left to move by their own volition into areas of retained habitat. (neighbouring ditch margin or adjoining habitats of garden / moat area.)

10. 43 During the construction phase , trenches should be filled on the same day as excavation where possible to prevent animals from falling in. Where this is not possible any excavations should be firmly covered overnight with ply/OSB sheets, to exclude any access.

10.44 All materials should be stored on bare ,firm ground or hard standing, - on pallets, to avoid injury to sheltering animals during later movement. Long term storage of materials should be avoided.

10.45 Any building waist stored on site temporarily should be in skips to prevent animals taking refuge.

10 .46 Should any animals be encountered over the construction phase, they should be left to disperse naturally , without interference. If this is not possible, then advice should be sought from a suitably experienced ecologist.

10.5 In view of the local presence of Swifts and these being a species of particular conservation concern swift boxes or swift nesting bricks should be included in the buildings design.

Two integrated swift boxes (schwegler Brick Nest Box Type 25) or boxes See BTO Swift nest box positioned under the eaves . Two of these installed in / on each house at least five metres from ground level.

10.6 A Habitat Suitability Index survey and calculations made to assess the likely presence of amphibians , in particular the Great Crested Newt. This so an informed decision can be made as a wether a full survey within the correct calender months is required to determine the presence of this protected species.

T C Watts FMD Principal Ecologist Framlingham Environmental.

11 ADDENDUM

REFERENCE RECOMMENDATIONS

A desk top study identified four areas of wetland / drains / ponds within viable distance of the proposed development site with reference to amphibians. With specific reference to Great Crested Newts - EPS , a Habitat Suitability Survey was undertaken as recommended in the preliminary survey.

HSI DATA SHEET
HABITAT SUITABILITY INDEX TABLE

Background - graphs / mapping not included.

The Habitat Suitability Index (HSI) for the great crested newt was developed by Oldham *et al*. (2000). HSI scoring systems were originally developed by the US Fish and Wildlife Service as a means of evaluating habitat quality and quantity. An HSI is a numerical index, between 0 and 1. 0 indicates unsuitable habitat, 1 represents optimal habitat. The HSI for the great crested newt incorporates ten suitability indices, all of which are factors thought to affect great crested newts. These ten suitability indices are retained in this current Guidance Note.

The HSI system proposed by Oldham *et al*. (2000) is fairly easy to use. However, one suitability index (SI_9, terrestrial) involves a more lengthy measurement and calculation than the other factors. In using the HSI system with volunteer surveyors in Kent, Lee Brady substituted a simpler evaluation of terrestrial habitat quality, a four- point scale. Volunteers have found this modified HSI relatively easy to use.

Several other, local, surveys have utilised the HSI, but utilised their own variations on the original system. In 2007, a workshop was held at the Herpetofauna Workers' Meeting to evaluate the use of the HSI for the great crested newt, with the aims of:

- identifying components of the system that may need clarification or refinement
- agreeing on a standard that can be easily used by volunteers and professionals alike.

A conservative approach has been adopted in modifying the use of the original HSI suitability indices.

- **Use and limitations of HSI**

The HSI for great crested newts is a measure of habitat suitability. It is not a substitute for newt surveys. In general, ponds with high HSI scores are more likely to support great crested newts than those with low scores. However, the system is not sufficiently precise to allow the conclusion that any particular pond with a high score will support newts, or that any pond with a low score will not do so.

There is also a positive correlation between HSI scores and the numbers of great crested newts observed in ponds. So, in general, high HSI scores are likely to be associated with greater numbers of great crested newts. However, the relationship is not sufficiently strong to allow predictions to be made about the numbers of newts in any particular pond.

HSI scoring can be useful in:

- Evaluating the general suitability of a sample of ponds for great crested newts
- Comparing general suitability of ponds across different areas
- Evaluating the suitability of receptor ponds in a proposed mitigation scheme.

- **How to collect data and calculate HSI**

The HSI is a geometric mean of ten suitability indices: $HSI=(SI_1 \times SI_2 \times SI_3 \times SI_4 \times SI_5 \times SI_6 \times SI_7 \times SI_8 \times SI_9 \times SI_{10})^{1/10}$

- The ten Suitability Indices are scored for a pond, in the field and from map work.
- The ten field scores are then converted to SI scores, on a scale from 0.01 to 1 (0.01 is used as the

bottom end of the range in stead of 0, because multiplying by 0 reduces all other SI scores to 0).

- The ten SI scores are then multiplied together.
- The tenth root of this number is then calculated $(X)^{1/10}$

The calculated HSI for a pond should score between 0 and 1.

Some of the field scores are categorical, some are numerical. The numerical field scores are converted to SI scores by reading off the values from graphs produced by Oldham *et al*. (2000) reproduced in this Guidance Note.

The field scores are the data that should be collected by a surveyor. A summary of data to collect is given in *Summary of scoring system* below. More full details of the scoring system, including descriptions of the criteria used in the categorical scores are given in *Details of Suitability Indices and Definitions of Categories.* Two of the SI sores (SI_1 and SI_8) can be carried out as desktop/map exercises and so do not have to be completed in the field. The remaining SI scores should be recorded as field scores, and later converted to suitability indices, in some cases reading SI scores from the graphs provided in *Details of Suitability Indices and Definitions of Categories.*

Categorisation of HSI scores

Lee Brady has developed a system for using HSI scores to define pond suitability for great crested newts on a categorical scale:

HSI Pond suitability

<0.5 = 0.5 – 0.59 = 0.6 – 0.69 = 0.7 – 0.79 = > 0.8 =

poor below average average good excellent

Summary of scoring system

SI_1 Location

Field score A (optimal)

B (marginal) C (unsuitable)

Details of suitability indices and definitions of categories

Factor 1. Geographic location (SI_1)

Sites should be scored according to the zone in which they occur. This scoring can be carried out either in the field, or as part of a desktop exercise.

Zone A, location is optimal, SI = 1 Zone B, location is marginal, SI = 0.5 Zone C, location is unsuitable, SI = 0.01.

Some sites will fall on boundary lines between zones. In such cases, select medium-value scores i.e. Zone B.

SI_2 Pond area

SI 1

0.5 0.01

Field score Measure pond surface area (m_2) and round to nearest 50 m_2

SI Read off graph.

SI_3 Pond drying

Field score SI Never 0.9 Rarely 1.0 Sometimes 0.5 Annually 0.1

SI_4 Water quality

Field score SI Good 1.0 Moderate 0.67 Poor 0.33 Bad 0.01

SI_5 Shade

Criteria Never dries

Dries no more than two years in ten or only in drought. Dries between three years in ten to most years Dries annually

Criteria Abundant and diverse invertebrate community.

Moderate invertebrate diversity Low invertebrate diversity, few submerged plants Clearly polluted, only pollution-tolerant invertebrates, no submerged plants.

Field score Estimate percentage perimeter shaded to a least 1 m from shore. Read off graph.

SI

Criteria No evidence of water fowl (although moorhen may be present)

Waterfowl present, but little sign of impacts Severe impact of waterfowl

Criteria No records of fish stocking and no fish revealed during survey.

No evidence of fish, but local conditions suggest that they may be present. Small numbers of crucian carp, goldfish or stickleback known to be present. Dense populations of fish known to be present.

SI_6 Fowl

Field score SI Absent 1 Minor 0.67 Major 0.01

SI_7 Fish

Category SI Absent 1 Possible 0.67 Minor 0.33 Major 0.01

SI_8 Ponds

Field score Count the number of ponds within 1 km of survey pond, not separated by major barriers, and divide by 3.14. This can be done from maps rather than in the field.

SI_9 Terrestrial habitat

SI Read off graph.

Field score Good

Moderate Poor None

SI_{10} Macrophytes

SI 1 0.67 0.33 0.01

Field score Estimate the percentage of the pond surface area occupied by macrophyte cover (between May and the end of September)

3

Details of Suitability Indices and Definitions of Categories Factor 1. Geographic location (SI_1)

Sites should be scored according to the zone in which they occur. This scoring can be carried out either in the field, or as part of a desktop exercise. Zone A, location is optimal, SI = 1

Zone B, location is marginal, SI = 0.5 Zone C, location is unsuitable, SI = 0.01.

Some sites will fall on boundary lines between zones. In such cases, select medium-value scores i.e. Zone B.

Factor 2. Pond area

Pond area is the surface area of the pond when water is at its highest level (excluding flooding events). This is usually in the spring. If the pond is being measured at another time of year, the springtime area should still be evident from vegetation types and evidence of a draw down zone around the pond.

Pond area should be measured as accurately as possible. There are several ways of doing this, for example by measuring axes of regularly shaped ponds, either by pacing out in the field, or using a map. Irregularly shaped ponds may have to be treated as a series of geometrical shapes, calculating the area for each and adding together.

Since it can be difficult reading off SI scores from graph, pond area should be rounded to nearest 50 m.

It can be particularly difficult to read off SI scores for very small ponds. For ponds smaller than 50 m_2a score of 0.05 should be used.

Factor 3. Permanence

Pond permanence should be deduced from local knowledge and on personal judgement. A landowner may know how often a pond dries. However, if not, the surveyor should make a judgement based on water level at the time of the survey, and taking seasonality into consideration. For example, a pond that is already dry by late spring is likely to dry out every year, etc.

Category Never dries

Rarely dries Sometimes dries Dries annually

SI Criteria 0.9 Never dries.

1.1 Dries no more than two years in ten or only in drought. 0.5 Dries between three years in ten to most years. 0.1 Dries annually.

Factor 4. Water quality.

The assessment of water quality is subjective and should be based primarily on invertebrate diversity. Hence, water quality should not be confused with water clarity. Sometimes clear water can be devoid of invertebrates, and turbid ponds can support a wealth of invertebrates. There is no quick and simple invertebrate index of water quality. However, some species are indicators of water quality.

Category SI Good 1.0

Moderate 0.67 Poor 0.33

Bad 0.01

Criteria Water supports an abundant and diverse invertebrate community. Netting reveals

handfuls of diverse invertebrates, including groups such as mayfly larvae and water shrimps. Moderate invertebrate diversity Low invertebrate diversity (e.g. species such as midge and mosquito larvae. Few submerged plants.

Clearly polluted, only pollution-tolerant invertebrates (such as rat-tailed maggots), no submerged plants.

Other cues may also provide information about water quality. For example, ponds subject to agricultural inputs are likely to have poor water quality.

Factor 5. Shade

Estimate the percentage of water shaded at least one metre from the shoreline.

Factor 6. Fowl

Category SI Absent 1 Minor 0.67

Major 0.01

Criteria No evidence of waterfowl impact (moorhens may be present).

Waterfowl present, but little indication of impact on pond vegetation. Pond still supports submerged plants and banks are not denuded of vegetation. Severe impact of waterfowl. Little or no evidence of submerged plants, water turbid, pond banks showing patches where vegetation removed, evidence of provisioning waterfowl.

Estimate percentage pond perimeter shaded, to at least 1m from the shore. Shading is usually from trees, but can include buildings but should not include emergent pond vegetation. Estimate should be made during the period from May to the end of September.

This factor is concerned with the impact of waterfowl upon a pond. At high densities, as created when waterfowl are encouraged to use a pond, by provision of food, the birds can remove all aquatic vegetation, pollute water and persistently stir sediments. Score as one of three categories.

'Waterfowl' includes most water birds, such as ducks, geese and swans. Moorhens should be ignored because almost every pond has at least one or two.

Factor 7. Fish

Information on fish should be gleaned from local knowledge and the surveyor's own observations. Pond owners will usually be aware of stocking with fish for commercial or aesthetic reasons. However, stickleback (which can be significant predators of great crested newt larvae, when present in large numbers) are unlikely to be deliberately introduced to a pond, but may arrive through other means. Netting is useful in detecting smaller fish,such as sticklebacks, or the fry of larger species. Criteria No records of fish stocking and no fish revealed by netting or observed with torchlight.

No evidence of fish, but local conditions suggest that they may be present. Small numbers of crucian carp, goldfish or stickleback known to be present. Dense populations of fish known to be present.

Category Absent

Possible Minor Major

SI 1 0.67 0.33 0.01

Factor 8. Pond count

This is the number of ponds occurring within 1 km of survey pond. Do not count the survey pond itself. Ponds on the far side of major barriers, such as main roads, should not be counted. Use 1:25,000 scale O.S. data, such as Explorer maps, GIS or web-based mapping sources. Pond counts can be carried out a by a survey coordinator and so do not necessarily have to be performed by surveyors.

Divide the number of ponds by Pi (3.14) to calculate the density of ponds per km_2, and read off graph.

Factor 9. Terrestrial

Scoring terrestrial habitat depends on the surveyor's understanding of newt habitat quality. Good terrestrial habitat offers cover and foraging opportunities and includes meadow, rough grassland, hedges, scrub and woodland. Terrestrial habitat should be considered only on the near side of any major barriers to dispersal (e.g. main roads or large expanses of bare habitat).

Category SI Good 1

Moderate 0.67 Poor 0.33 None 0.01

Criteria Extensive area of habitat that offers good opportunities for foraging and shelter

completely surrounds pond (e.g. rough grassland, scrub or woodland). Habitat that offers opportunities for foraging and shelter, but may not be extensive in area and does not completely surround pond. Habitat with poor structure that offers limited opportunities for foraging and shelter (e.g. amenity grassland). Clearly no suitable habitat around pond (e.g. centre of large expanse of bare habitat).

Great crested structure. The presence of rabbit borrows, small mammal holes, proximity to old farm buildings, stone walls, piles of loose stone/rock all contribute towards 'good' terrestrial habitat. Note that it is rare to encounter a pond with a terrestrial habitat category of 'none'.

newts do not have specific habitat requirements. However, good quality terrestrial habitat has

Factor 10. Macrophytes

Estimate the percentage of the pond surface area occupied by macrophyte cover. This includes emergents, floating plants (excluding duckweed) and submerged plants reaching the surface. Make estimate during the newt breeding season (March to May). Read off SI value from graph.

Fig. Guide for use in assessment of the proportions of vegetation cover in a pond. The areas of dark shading simulate a variety of vegetation dispersion patterns.

Reference

Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal 10 (4), 143-155.

Categorisation of HSI scores

Lee Brady has developed a system for using HSI scores to define pond suitability for great crested newts on a categorical scale:

HSI Pond suitability

<0.5 = 0.5 – 0.59 = 0.6 – 0.69 = 0.7 – 0.79 = > 0.8 =

poor below average average good excellent

2

Summary of scoring system

SI_1 Location

Field score A (optimal)

B (marginal) C (unsuitable)

SI_2 Pond area

SI 1

0.5 0.01

Field score Measure pond surface area (m_2) and round to nearest 50 m_2

SI Read off graph.

SI_3 Pond drying

Field score SI Never 0.9 Rarely 1.0 Sometimes 0.5 Annually 0.1

SI_4 Water quality

Field score SI Good 1.0 Moderate 0.67 Poor 0.33 Bad 0.01

SI_5 Shade

Criteria Never dries

Dries no more than two years in ten or only in drought. Dries between three years in ten to most years Dries annually

Criteria Abundant and diverse invertebrate community.

Moderate invertebrate diversity Low invertebrate diversity, few submerged plants Clearly polluted, only pollution-tolerant invertebrates, no submerged plants.

Field score Estimate percentage perimeter shaded to a least 1 m from shore. Read off graph.

SI

Criteria No evidence of water fowl (although moorhen may be present)

Waterfowl present, but little sign of impacts Severe impact of waterfowl

Criteria No records of fish stocking and no fish revealed during survey.

No evidence of fish, but local conditions suggest that they may be present. Small numbers of crucian carp, goldfish or stickleback known to be present. Dense populations of fish known to be present.

SI_6 Fowl

Field score SI Absent 1 Minor 0.67 Major 0.01

SI_7 Fish

Category SI Absent 1 Possible 0.67 Minor 0.33 Major 0.01

SI_8 Ponds

Field score Count the number of ponds within 1 km of survey pond, not separated by major barriers, and divide by 3.14. This can be done from maps rather than in the field.

SI_9 Terrestrial habitat

SI Read off graph.

SI Read off graph.

Field score Good

Moderate Poor None

SI_{10} Macrophytes

SI 1 0.67 0.33 0.01

Field score Estimate the percentage of the pond surface area occupied by macrophyte cover (between May and the end of September)

3

Details of Suitability Indices and Definitions of Categories Factor 1. Geographic location (SI_1)

Sites should be scored according to the zone in which they occur. This scoring can be carried out either in the field, or as part of a desktop exercise. Zone A, location is optimal, SI = 1

Zone B, location is marginal, SI = 0.5 Zone C, location is unsuitable, SI = 0.01.

Some sites will fall on boundary lines between zones. In such cases, select medium-value scores i.e. Zone B.

Factor 2. Pond area

Pond area is the surface area of the pond when water is at its highest level (excluding flooding events). This is usually in the spring. If the pond is being measured at another time of year, the springtime area should still be evident from vegetation types and evidence of a draw down zone around the pond.

Pond area should be measured as accurately as possible. There are several ways of doing this, for example by measuring axes of regularly shaped ponds, either by pacing out in the field, or using a map. Irregularly shaped ponds may have to be treated as a series of geometrical shapes, calculating the area for each and adding together.

Since it can be difficult reading off SI scores from graph, pond area should be rounded to nearest 50 m.

It can be particularly difficult to read off SI scores for very small ponds. For ponds smaller than 50 m_2a score of 0.05 should be used.

Factor 3. Permanence

Pond permanence should be deduced from local knowledge and on personal judgement. A landowner may know how often a pond dries. However, if not, the surveyor should make a judgement based on water level at the time of the survey, and taking seasonality into consideration. For example, a pond that is already dry by late spring is likely to dry out every year, etc.

Category Never dries

Rarely dries Sometimes dries Dries annually

SI Criteria 0.9 Never dries.

1.0 Dries no more than two years in ten or only in drought. 0.5 Dries between three years in ten to most years. 0.1 Dries annually.

4

Factor 4. Water quality.

The assessment of water quality is subjective and should be based primarily on invertebrate diversity. Hence, water quality should not be confused with water clarity. Sometimes clear water can be devoid of invertebrates, and turbid ponds can support a wealth of invertebrates. There is no quick and simple invertebrate index of water quality. However, some species are indicators of water quality.

Category SI Good 1.0

Moderate 0.67 Poor 0.33

Bad 0.01

Criteria Water supports an abundant and diverse invertebrate community. Netting reveals

handfuls of diverse invertebrates, including groups such as mayfly larvae and water shrimps. Moderate invertebrate diversity Low invertebrate diversity (e.g. species such as midge and mosquito larvae. Few submerged plants.

Clearly polluted, only pollution-tolerant invertebrates (such as rat-tailed maggots), no submerged plants.

Other cues may also provide information about water quality. For example, ponds subject to agricultural inputs are likely to have poor water quality.

Factor 5. Shade

Estimate percentage of pond perimeter shaded , at least 1m from the shore . Shading is usually from trees but can also be from buildings but should not included emergent pond vegetation. Estimation should be during the period from May to the end of September.

Factor 6. Fowl

Category SI Absent 1 Minor 0.67

Major 0.01

Criteria No evidence of waterfowl impact (moorhens may be present).

Waterfowl present, but little indication of impact on pond vegetation. Pond still supports submerged plants and banks are not denuded of vegetation. Severe impact of waterfowl. Little or no evidence of submerged plants, water turbid, pond banks showing patches where vegetation removed, evidence of provisioning waterfowl.

Estimate percentage pond perimeter shaded, to at least 1m from the shore. Shading is usually from trees, but can include buildings but should not include emergent pond vegetation. Estimate should be made during the period from May to the end of September.

This factor is concerned with the impact of waterfowl upon a pond. At high densities, as created when waterfowl are encouraged to use a pond, by provision of food, the birds can remove all aquatic vegetation, pollute water and persistently stir sediments. Score as one of three categories.

‘Waterfowl’ includes most water birds, such as ducks, geese and swans. Moorhens should be ignored because almost every pond has at least one or two.

Factor 7. Fish

Information on fish should be gleaned from local knowledge and the surveyor’s own observations. Pond owners will usually be aware of stocking with fish for commercial or aesthetic reasons. However, stickleback (which can be significant predators of great crested newt larvae, when present in large numbers) are unlikely to be

5

deliberately introduced to a pond, but may arrive through other means. Netting is useful in detecting smaller fish,

such as sticklebacks, or

the fry of larger species.

Criteria No records of fish stocking and no fish revealed by netting or observed with torchlight.

No evidence of fish, but local conditions suggest that they may be present. Small numbers of crucian carp, goldfish or stickleback known to be present. Dense populations of fish known to be present.

Category Absent

Possible Minor Major

SI 1 0.67 0.33 0.01

Factor 8. Pond count

Getamap Magic Digimap

www.ordnancesurvey.co.uk/oswebsite/getamap/ www.magic.gov.uk/site_map.html edina.ac.uk/digimap/

This is the number of ponds occurring within 1 km of survey pond. Do not count the survey pond itself. Ponds on the far side of major barriers, such as main roads, should not be counted. Use 1:25,000 scale O.S. data, such as Explorer maps, GIS or web-based mapping sources. Pond counts can be carried out a by a survey coordinator and so do not necessarily have to be performed by surveyors.

Divide the number of ponds by Pi (3.14) to calculate the density of ponds per km_2, and read off graph.

Factor 9. Terrestrial

Scoring terrestrial habitat depends on the surveyor's understanding of newt habitat quality. Good terrestrial habitat offers cover and foraging opportunities and includes meadow, rough grassland, hedges, scrub and woodland. Terrestrial habitat should be considered only on the near side of any major barriers to dispersal (e.g. main roads or large expanses of bare habitat).

Category SI Good 1

Moderate 0.67 Poor 0.33 None 0.01

Criteria Extensive area of habitat that offers good opportunities for foraging and shelter

completely surrounds pond (e.g. rough grassland, scrub or woodland). Habitat that offers opportunities for foraging and shelter, but may not be extensive in area and does not completely surround pond. Habitat with poor structure that offers limited opportunities for foraging and shelter (e.g. amenity grassland). Clearly no suitable habitat around pond (e.g. centre of large expanse of bare habitat).

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7

Pond 1 Southern Moat / Drain - North of Brickwall Farm on the southern perimeter of the site.
TM 060668

Pond 2 South of The Oaks on the Northern perimeter of the site
TM 060670

Pond 3 Drain on the east side of Broad Street opposite the site
TM 061669

Pond 4 At Long Meadow to the North East of the site
TM 061670

HSI DATA SHEET
HABITAT SUITABILITY INDEX TABLE

HSI Criteria	Pond 1	Pond 2	Pond 3	Pond 4
SI1 Location Field Score	1	1	1	1
SI 2 Pond area Field score	0.3	0.5	0.1	0.1
SI3 Pond Drying Field Score	0.5	1	0.1	0.1
SI4 Water Quality Field Score	0.01	0.01	0.01	0.01
SI5 Shade Field Score	1	0.8	0.2	0.2
SI6 Fowl Field Score	1	0.01	1	1
SI7 Fish Category	1	1	1	1
SI8 Ponds Field Score	0.9	0.9	0.9	0.9
SI9	0.67	0.33	0.67	1

Terrestrial habitat Field score				
SI10 Macrophytes Field score	0.3	0.3	0.3	0.3
TOTAL	10th route calculation 0.439	0.28	0.29	0.29

CONCLUSION OF HSI SURVEY RESULTS / CALCULATIONS

Categorisation would show all ponds are < 0.5 with regard to pond suitability for Great Crested newts - GCN.

Field observations and experience would concur with these results and there is no necessity to carry out further survey work.

Photographic detail of ponds / drains / mapping are held on file by Phil Cobbold planning for referral if required.

Preliminary Ecology report TCW/FE/ 9076020 Recommendations of 10.4 detail measures to be taken to safe guard any amphibians that may be present in the area.

T C Watts FMD Principal Ecologist Framlingham Environmental.