

APPLICATION FOR A LICENCE TO DELIBERATELY KILL, INJURE, CAPTURE (TAKE), DELIBERATELY DISTURB, DAMAGE/DESTROY A BREEDING SITE/RESTING PLACE OR TRANSPORT AN EUROPEAN PROTECTED SPECIES (EPS)

THE CONSERVATION OF HABITATS AND SPECIES REGULATIONS 2010 FOR THE PURPOSE OF :-

- **Preserving public health or public safety** or other **imperative reasons of overriding public interest** including those of a social or economic nature and beneficial consequences of primary importance for the environment;
- **Preventing the spread of disease;**
- **Preventing serious damage** to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other form of property or to fisheries; to allow people to carry out activities which would otherwise be illegal.

Information for completion of an application form:

1. Please complete in **BLOCK CAPITALS** (* delete as applicable)
2. **Please answer all questions in detail. All questions highlighted in red must be fully completed otherwise the application will be returned to the named Ecologist. Uncompleted questions will mean delays in your application being processed.**
3. Please be aware that if your activity has received planning permission (**please note that the Species Protection Team will not process applications where planning permission is still under consideration**), listed building consent and or a tree preservation order, you will need to include the following:
 - **Local Planning Authority Document** completed and signed prior to submitting your application
 - **Copy of the permissions associated with the application**
 - **Copy of the delegated decision report and / or planning committee minutes**
 - **Documentation from the Local Planning Authority confirming the discharge of any species related conditions which require discharge prior to the commencement of the development.**
4. Please ensure that Surveys submitted with your application are less than 2 years old.
5. Applications can be accepted **either** electronically or by post.

Electronic applications These can be e mailed to specieslicence@naturalresourceswales.gov.uk. Please **DO NOT** also send the application by post. We will not require wet signatures if the electronic signature box has been completed.

Postal Applications: Please provide two copies of every document, one copy of the application form must be originally signed by both the licensee and the Ecologist (wet signatures required). Please post to: **Species Protection Team, National Permitting Team, Natural Resources Wales, Maes y Ffynnon, Penrhosgarnedd, Bangor, LL57 2DW**

Please use the tick sheet provided at the end of this application form as a reminder to ensure that you have enclosed all the required documents to enable us to process your application.

6. An acknowledgment will be sent out on receipt of your application, please contact us if you have not received a response within 5 working days
7. NRW aims to process applications within **30 working days** of receipt of **all information required**, we cannot guarantee an earlier response.
8. All applicants should read the supporting notes at the end of this form.

1. Part A. The Applicant (the Developer or Landowner): Personal details

These questions relate to the person who will be the named licensee. This needs to be a named individual; company names and several individuals are not permitted. As the licensee, you will be responsible for ensuring compliance with the licence and its conditions.

1. (a) Name of applicant

Title (Mr/Mrs/Miss/Ms) Forename(s) Surname

Mr	Tim	Howard
----	-----	--------

Company Name

Welsh Government

Business Title (if appropriate)

(b) Address

Crown Building

Cathays Park

Town Cardiff

County

Postcode

CF10 3NQ

Tel number (incl. national dialling)

Mobile number

Email address (Please provide an email address if possible as it means we can email you a copy of your licence if approved. A postal copy will be sent regardless)

Clwyd.Roberts@Wales.GSI.Gov.UK (Accredited Licence Holder)
David.Hughes@Wales.GSI.Gov.UK (Accredited Licence Holder)

1. Part B. The Ecologist: Personal details and experience with the species concerned

These questions relate to the person acting on behalf of the developer/landowner and who will be responsible for delivering specific elements of any licence granted in respect of the disturbance of European Protected Species, including the overseeing of exclusion works and mitigation.

Title (Mr/Mrs/Miss/Ms) Forename(s) Surname

Ms	Samantha	Shove
----	----------	-------

Company Name

TACP (UK) Ltd

Business Title (if appropriate)

Ecologist

(b) Address

10 Park Grove

Town

Cardiff

County

Cardiff

Postcode

CF10 3BN

Tel number (incl. national dialling)

02920228966

Mobile number

Email address

sshove@tacr.co.uk

2. Previous applications:

Have you held a relevant EPS licence issued by any of the following? (please insert an **X** as appropriate)

The Welsh
Government

Natural
Resource Wales

Other (please specify)

If **YES**, please give your last licence reference number

and the year in which the licence was issued.

What species did the licence cover?

	If NO, you will need to enclose written reference (originals only, not photocopies) from two people who can vouch for your suitability and competence for this type of work and give details of appropriate experience. At least one referee should have held a relevant licence within the last three years. We may contact these referees to verify their statements. Please include their names, contact details and qualifications below.			
	Mr David Clements DCE Ltd Carlton House 5 Herbert Terrace Penarth Glamorgan, Wales CF64 2AH	Mr Craig Stenson Avalon Ecology Pendine House 6 Bridge Street Chepstow Monmouthshire NP16 5EY		
3.	Experience and qualifications			
a.	Please give brief details of your experience and qualifications relevant to the species listed at Part C (Question 5) below (continue on a separate sheet if necessary).			
	I have over eight years of specialist experience and knowledge relating to Great Crested Newts and related important/protected species. I have a sound knowledge and practical experience of survey and mitigation methodologies as well as legislation and guidelines and have completed a two day Great Crested Newt training course in conjunction with the MoD and the Herpetological Conservation Trust. I also hold GCN survey licences for both England and Wales. I have experience as a lead ecologist on works in Wrexham, namely on the Industrial Estate Access Roads, involving Great Crested Newt mitigation measures, comprising pond and terrestrial habitat creation and pond restoration. I have also had the responsibility of creating and overseeing the layout and management of GCN fencing incorporating ecological constraints, as well as ecological supervision during construction.			
b.	Please give brief details any experience and/or qualifications which you have gained with other species and you think is relevant to show your suitability and competence for the proposed works			
	I have been involved in a number of projects throughout England and Wales and I have completed surveys on over 40 sites across Wales, where I have had to manage a number of protected species, as well as participating in the creation of mitigation design and enhancement measures. I have led ecology teams in the implementation of mitigation for highway schemes. I have also prepared European Protected Species Licence applications through consultation with Natural Resources Wales, Wrexham County Borough Council and Welsh Government. I have carried out trapping, translocation and destructive searches for a number of protected species including Slow-worms and other reptiles and amphibians on both large and small scale developments.			
4.	Accredited Agents			
	An accredited agent is a suitably qualified experienced person who is able to carry out work under a licence without the personal supervision of the licensee. To carry out work they must be in possession of a letter signed by the licensee appointing him or her as an accredited agent of the licensee for the purpose of the licence. At all times the licensee is fully responsible for all the work carried out under licence. An assistant is employed by a licensee or his/her agent to work under their direct personal supervision at all times. A breach of the licence conditions by an accredited agent, assistant or helper may result in the revocation of your licence.			
	Do you propose to employ accredited agents?	Yes	x	No
	If YES, please state their name(s) and the work they will be undertaking.			

Accredited agents will be involved in the works to capture and remove Great Crested Newts and any other amphibians from the proposed development site, which will also involve finger-tip searches of suitable habitat / vegetation within the enclosed drift fencing areas and vegetation clearance where necessary. Further works will involve process of translocating any GCN found into an enhanced area to the north of the site. The accredited agents to be used cannot be named at present as this will be determined by their availability at the time of works. All agents will be GCN survey licence holders.				
Do you propose to employ assistants?		Yes	x	No
If YES , please state their name(s) and the work they will be undertaking.				
Assistants will be involved in the works under the supervision of a licensee. Assistants will undertake work on the site where applicable. They will work alongside the licensee, or undertake certain tasks (where constant supervision is not required) as deemed appropriate by the licensed ecologist. The assistants to be used cannot be named at present as this will be determined by their availability at the time of works. All assistants will have experience in GCN work and will be listed as either assistants or accredited agents on a GCN survey licence.				

Please answer questions 6-10 for the species specified in question 5. Please give as much detail and information as possible. Insufficient information may mean delays in processing your application as you will need to be contacted to give this. Make sure you answer all questions, in full. Please remember for question 10 to include the month and year to which you wish the licence to run until. Complete and attach an extra sheet if necessary.

Part C. The Application			
5.	Species (please insert a x as appropriate)		
	Otter		
	Dormouse		
	Great Crested Newt		x
	Bat		
Please indicate which species of bat is affected by the proposed works.			
	COMMON PIPISTRELLE (<i>Pipistrellus pipistrellus</i>)		BROWN LONG EARED (<i>Plecotus auritus</i>)
	SOPRANO PIPISTRELLE (<i>Pipistrellus pygmaeus</i>)		BARBASTELLE (<i>Barbastella barbastellus</i>)
	WHISKERED (<i>Myotis mystacinus</i>)		BRANDT'S (<i>Myotis brandtii</i>)
	DAUBENTON'S (<i>Myotis daubentonii</i>)		NATTERER'S (<i>Myotis nattereri</i>)
	LESSER HORSESHOE (<i>Rhinolophus hipposideros</i>)		NOCTULE (<i>Nyctalus noctula</i>)
	GREATER HORSESHOE (<i>Rhinolophus ferrumequinum</i>)		ALCATHOE (<i>Myotis alcathoe</i>)
Any other bat species (please specify)			
<u>Note:</u> Have you sent your records to the Local Records Centre? If not please contact Natural Resources Wales for advice at the contact provided at the end of this form or contact the LRC directly via the contacts on this link: www.lrcwales.org.uk			
		Yes	No

6.	Purpose of the licence application (please insert a x as appropriate)		
	Please indicate the primary purpose for undertaking the proposed works.		
	Preserving -	public health	
		public safety	
		¹ other imperative reasons of overriding public interest	x

Preventing -	the spread of disease	
	serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other form of property or to fisheries	
¹ including those of a social or economic nature and beneficial consequences of primary importance for the environment		
Please explain fully below your reasons for the purpose chosen above. (E.g. Why are the works necessary; how do they fit the selected purpose; What will be the result after the works?)		
The works (for which outline planning permission has been granted) are necessary in order to develop an industrial unit with associated parking and pedestrian access. This development is important as it will bring economic benefits to the area as well as providing valuable jobs to the local community. The creation of ponds in the mitigation area will also provide new potential links between Great Crested Newt populations in the surrounding area of the site.		
7. Summary of the Planning Position (please insert a x in one box only)		
No Planning Permission required		
Full Planning Permission granted		
Outline Planning Permission granted		x
Reserved Matters		
Other consents granted for the proposed activity E.g., Listed building consents, Tree preservation orders etc. Please list these below		
Consent/s granted: Name of Planning Authority- Wrexham County Borough Council Planning ref. No/s.- ABE P/2014/0195 Land at Abenbury Way, Wrexham Industrial Estate, LL13 9UZ Description: Outline Application for Industrial Unit and Associated Vehicular and Pedestrian Access In reaching this decision the Council has had regard to the relevant policies in the Wrexham Unitary Development Plan which are as follows: E1, EC6, GDP1,T8, Employment allocations, Biodiversity Conservation, Development objectives, parking - PLEASE MAKE SURE ALL REQUIRED PLANNING DOCUMENTATION IS SUBMITTED WITH YOUR APPLICATION <i>Please refer to note 3 on the 1st page for further details</i> - Please note that the Species Protection Team will not process applications where planning permission is still under consideration and where any species related conditions are yet to be discharged.		
8. Purpose of the proposed work		
(a)	Please explain why it is necessary to carry out the proposed work affecting the species.	
	This work is required to remove Great Crested Newts from the proposed development site, prior to construction of the industrial unit with associated parking and pedestrian access. This work will ensure that no GCN are injured or killed during the development works. Once GCN have been cleared from the site, this will then allow for the undertaking of mitigation measures (including creation of aquatic and terrestrial habitat) to the northern end of the site, in order to be able to translocate GCN away from development areas where construction of the industrial unit will cause permanent terrestrial habitat loss.	
(b)	Provide a description of the proposed activity (e.g. capture of otters followed by damage or destruction of breeding site or resting place)	
	Habitat enhancement works will be undertaken in September with the creation of aquatic habitat and refugia / hibernacula and species rich grassland within the mitigation site and surrounding the pond edges. Exclusion fencing will be installed around the development area, with drift fencing inside the exclusion area. Pitfall traps and artificial refugia will be installed on the inside of the exclusion and drift fencing, flush with the ground surface and will be inspected on a daily basis for a minimum of 30 days (during suitable weather conditions).	

	Any GCN that are captured will be relocated to the newly created mitigation site. Upon completion of the trapping, following 5 consecutive clear visits and destructive searches of the area, the drift fencing will be removed in order to allow construction to commence. One way fencing will be installed along the boundaries of the mitigation area, to allow GCN to leave the northern area of the site, prior to construction of aquatic habitats and refugia/hibernacula. Once works are complete, GCN will be translocated into the newly created habitat to ensure no presence within the proposed development site.	
9.	Satisfactory alternatives:	
	Please provide details of what other courses of action have you considered to avoid or minimise the effects on the protected species? E.g. doing nothing, alternative designs, or sites. Why are the alternatives not suitable? Why have they been discounted? Please attach further information if necessary.	
	All available sites within the Wrexham Industrial Estate were considered for siting the proposed development, in order to minimise impacts upon protected species within the area. Other sites were ruled out as they were not considered suitable in terms of plot size and position. Alternative options for the development were also limited as there is a finite number of vacant sites within the Wrexham Industrial Estate and therefore the Land at Abenbury Way (as shown in Annex 4 of the Method Statement: Site Location Plan) was chosen.	

10.	Activities to be Licensed							
	(a) Proposed Methods							
	Please complete all relevant columns in the table below to indicate the methods you propose to use, the activity involved, and the time period for each method. This information will be used when drawing up the licence and failure to give full details may result in an inappropriate licence being issued.							
Activity to be licensed (please insert a x as appropriate)						Method to be used e.g. hand, net, exclusion etc.	Time period (month and year)	
Capture (including temporary possession)	Transport	Disturb	Damage a breeding site or resting place	Destroy a breeding site or resting place	Kill (only in exceptional circumstances – see		From	To
		X				Exclusion/drift fencing	Sept 2014	March 2016
X	X	X				Pitfall traps/artificial refugia	Sept 2014	October 2014
X	X	X	X	X		The resting place will be dismantled by hand before fencing/traps are put in.	Sept 2014	October 2014

**please include biosecurity measures within the provisions of the method statement

	(b) Location of proposed licensed action
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¹ Killing will only be licenced in exceptional circumstances, you should discuss the particular situation with the Regional Senior Species Officer in NRW for your area.

	Site name and address	Plot C4			
		Abenbury Way			
		Wrexham Industrial Estate			
	Town	Wrexham			
	County	Wrexham County Borough	Postcode	LL13 NUD	
O.S. Ref. (e.g. ST 123 123)		SJ 373 505			
	(c)	Does your Method Statement include a location map of relevant scale? Normally 1:25,000	Yes	X	No
	(d)	Please provide an estimate of the number of animals that will be affected by the licensed work?	7		
	(e)	Please state why the proposed actions will not be detrimental to the population of the species concerned at a favourable conservation status.			
The proposed exclusion and translocation of GCN from the proposed development site will ensure that no GCN are killed or injured during the construction works. The translocation of GCN into the identified receptor site and the maintenance of habitat corridors around the site will ensure that no animals are left isolated as part of either the exclusion exercise or the construction works. The creation of aquatic and terrestrial habitats within the receptor area to the northern end of the site will replace the habitat lost due to the development works as well as providing more suitable habitats for GCN in the area. This mitigation will also provide links to other suitable habitat areas further to the north and east of the proposed development where GCN populations are already present ensuring that this population does not become isolated and that any meta-population in the wider area is maintained.					
11. Consideration of Designated Sites					
Designated Areas: Local Nature Reserves (LNR), National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI), Special Protection Area (SPA), Special Areas of Conservation (SAC), Ramsar sites, and certain other river/lake systems.					
	(a)	Will any part of the proposed activity fall within an area covered by a designated site. E.g. LNR, NNR, SSSI, SAC, SPA, Ramsar?	Yes		No X
	(b)	Will any part of the proposed activity fall within or adjacent to a designated site?	Yes		No X
	(c)	If YES to either of the above, have you consulted with Natural Resource Wales for advice on the implications of your application on the protected site?	Yes		No X
	(d)	Please give either the outcome of your consultations or the reason why you have not consulted. Please enclose any relevant correspondence.			
Natural Resources Wales have been consulted as part of the planning process for the site. The nearest designated sites for Great Crested Newts are 7km from the site boundary and therefore will not be affected due to the low impact nature of the works. Natural Resources Wales have been consulted on the method statement for advice regarding long term management and monitoring and the number of years that this should be undertaken and by which organisation once land transfer has been agreed. Advice was also taken regarding inclusion of ecological audit performance indicators.					

Part D. Declarations

12	Have you or your accredited agents or assistants ever been convicted of a wildlife offence?	Yes		No	X
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	If YES , please give details, including dates			
13.	I have read and understand the guidance provided in this application form. I declare that the particulars given are correct to the best of my knowledge and belief, and I apply for a licence in accordance with these particulars. Applicants should note that it is an offence regulation 57 of the Conservation of Habitats and Species Regulations 2010 to knowingly or recklessly provide false information in order to obtain a licence. If a licence is granted I agree to send to NRW a written report of the licensed activities within four weeks of the expiry of the licence.			
I authorise employees or representatives of Natural Resource Wales to enter the site which subject to this application for the purpose of monitoring and inspecting the permitted works (please place an x in the box opposite).				☒
Signature of the Applicant		Date	16.07.14	
		<i>For electronic applications please insert an electronic signature above or place an x in the box opposite to confirm agreement with the declarations above.</i>		☒
Name in BLOCK LETTERS		TIM HOWARD		
Signature of the Ecologist		Date	16.07.14	
		<i>For electronic applications please insert an electronic signature above or place an x in the box opposite to confirm agreement with the declarations above.</i>		☒
Name in BLOCK LETTERS		SAM SHOVE		

Please complete this CHECKLIST fully

Please return your full completed application to the following Natural Resource Wales address:		
Species Protection Team, Natural Resources Wales, Maes y Ffynnon, Penrhosgarnedd, Bangor, LL57 2DW or e-mail your completed form to specieslicence@naturalresourceswales.gov.uk Tel. 03000653000	Checklist before submitting your application:	
	Completed Application Form (original plus one copy)	X
	Method Statement (original plus one copy)	X
	Protected Species Survey/s(original plus one copy)	
	Completed original Local Planning Authority Consultation Document (if Planning Permission or other consents are required/have been granted)	
	Copy of any other granted consents (Listed building/ Tree preservation orders/ etc)	
	Copy of the permissions associated with the application and copies of the delegated decision report and / or planning committee minutes	X
	Documentation from the Local Planning Authority confirming the discharge of any species related conditions which require discharge prior to the commencement of the development.	

NOTES FOR GUIDANCE (Please read the following notes carefully).

- i. This is an application form for a licence to deliberately kill, injure, capture (take), deliberately disturb, damage/destroy a breeding site/resting place or transport an european protected species (EPS) under the Conservation of Habitats and Species Regulations 2010 for the purpose of :-
- Preserving public health or public safety** or other **imperative reasons of overriding public interest** including those of a social or economic nature and beneficial consequences of primary importance for the environment;

- **Preventing the spread of disease;**
- **Preventing serious damage** to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other form of property or to fisheries; to allow people to carry out activities which would otherwise be illegal.

Natural Resources Wales, in exercise of the powers conferred under regulation 53(1) and 56(3) (a) of the Conservation of Habitats and Species, Regulations 2010 may issue licences for the following purposes:

Provided that:

- that there is **no satisfactory alternative**; and
 - that the action authorised **will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status** in their natural range.
- All questions in this application form must be completed in full unless otherwise stated: failure to provide adequate information will delay the processing of your application. Any further information you wish to provide should be appended on additional sheets. We aim to process applications within 30 working days of receipt of all the information requested. We cannot guarantee an earlier response.
 - It is a condition of any licence issued that a full report of the work carried out under licence is submitted within four weeks of the expiry of the licence. You will be supplied with a licence report form on which to do this. Failure to do so may result in future applications being refused. Information from these reports is required to provide summary information to NRW and others on the number of licences issued, the purpose of the licence and which species are covered. None of these summary statistics includes personal information about licensees. The information may also be used for conservation purposes and shared with other organisations.
 - Please be aware that if your activity requires or has received planning permission, listed building consent and or a tree preservation order, you will need to include the following:
 - Local Planning Authority Document completed and signed prior to submitting your application
 - Copy of the permissions associated with the application
 - Copy of the delegated decision report and / or planning committee minutes
 - Documentation from the Local Planning Authority confirming the discharge of any species related conditions which require discharge prior to the commencement of the development.
 - If you are submitting your application by post please make sure that we are given 2 paper copies of all the required documentation including any plans of the buildings and that the print on these can clearly be read. All copies must be identical to the original document, and in colour as appropriate.
 - Please note that we will not process your application until we have received all the relevant documentation. Please be aware that if we do not receive the correct amount of copies of the information asked for it will delay your application until we have received them.**
 - Please answer all questions fully and in detail. The more information you give us regarding your proposed activity, the less likely it is that we will need to contact you and cause delays in the progress of your application.
 - Please ensure that the information you send us, is properly separated and titled and if posted to us that each part is bound together; failure to do so will delay the processing of your application.
 - Applications are dealt with chronologically. This means they are processed according to when they were submitted, not according to the timing of the works. Please submit your application in good time before the proposed works. If you think your application needs to be dealt with urgently, please ring us to discuss and agree this before its submission.
 - When answering questions, particularly 6-10, it may help with your answers if you consider the why, what, how, where and when, approach. For example: Why are you doing it? What are you going to be doing? How will it affect the species in question? Etc.
 - Natural Resource Wales can modify or revoke any licence that may be issued but this will not be done unless there are good reasons for doing so. Any licence that is issued is likely to be revoked immediately if it is discovered that false information had been provided which resulted in the issue of a licence.
 - All of the information held by NRW, relating to your application for a licence will be processed and managed by us in accordance with our obligations and duties under the:
 - Data Protection Act 1998;

- Freedom of Information Act 2000;
- The Environmental Information Regulations 2004; and
- All other laws relating to access to information.

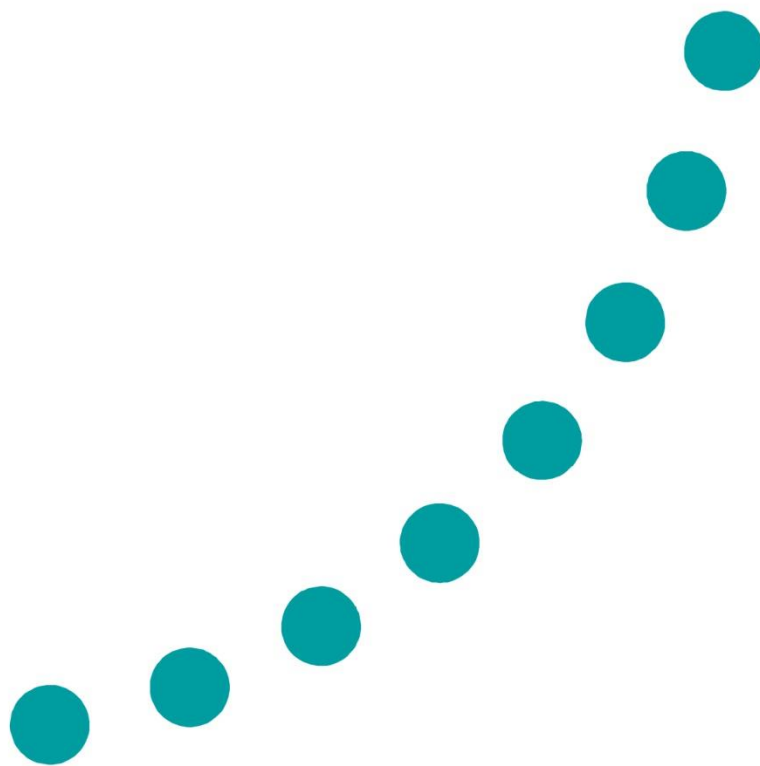
With this in mind, your information, including your personal information, may be the subject of a request by another member of the public. When responding to such requests we may be required to release information, including your personal information. Our response to such requests will be in accordance with the guidelines provided by the Welsh Government Code of Practice on Access to Information which can be found at www.information.wales.gov.uk

For further information about the personal data collected and its use, if you have any concerns about the accuracy of personal data, or wish to exercise any of your rights under the above legislation you should contact:

- Access to Information Officers, Natural Resources Wales, Ty Cambria, 29 Newport Road Cardiff CF24 0TP, or email atiteam@naturalresourceswales.gov.uk or telephone 0300 065 3000
- The Information Commissioners Office help line can be contacted on 029 2067 8400 or at www.ico.gov.uk

- xiii Applicants should note that a licence from NRW does not grant access or power of entry onto any land.**
- xiv. Any information included in this application which the applicant considers to be in confidence for commercial or industrial reasons or to be the applicant's intellectual property must be clearly marked as such.**

In this document "Natural Resources Wales" means the Natural Resources Body for Wales established by article 3 of the Natural Resources Body for Wales (Establishment) Order 2012. The Natural Resources Body for Wales (Functions) Order 2013 transferred the relevant functions of the Countryside Council for Wales, and functions of the Environment Agency and the Forestry Commission in Wales to the Natural Resources Body for Wales.



The Development of Plot C4, Wrexham Industrial Estate, Wrexham
Application for a European Protected Species Licence
Licence Method Statement

Welsh Government

THE DEVELOPMENT OF PLOT C4, WREXHAM INDUSTRIAL ESTATE, WREXHAM

APPLICATION FOR A GREAT CRESTED NEWT EUROPEAN PROTECTED SPECIES LICENCE

LICENCE METHOD STATEMENT

TACP
10 PARK GROVE
CARDIFF
CF10 3BN

Project Number: **2134**
Revision: **Rev 3**

Revision No.	Date of Revision	Checked by	Date	Approved by	Date
0	03.07.14	SS	03.07.14	PMcC	03.07.14
1	14.07.14	SS	14.07.14	PMcC	14.07.14
2	29.08.14	SS	29.08.14	PMcC	29.08.14
3	01.09.14	SS	01.09.14	PMcC	01.09.14

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Great Crested Newt - Licence Method Statement Wrexham Industrial Estate Plot C4

A Executive Summary

Summary of site location and context.

This Licence Application Method Statement details the proposed works to be undertaken at an area of land (Plot C4) within the Wrexham Industrial Estate. These works will enable the construction of the proposed new industrial unit and implementation of habitat mitigation and enhancement works to create suitable Great Crested Newt (GCN) habitat to maintain existing GCN populations in the area. This work will involve the creation of a new industrial unit and associated parking, pedestrian access on land at Abenbury Way, as part of the development. The mitigation works will also involve pond creation, hibernacula/refugia pile creation, erection of amphibian fencing, scrub planting and the creation of a Great Crested Newt underpass.

This Licence Application Method Statement is for the works which include site preparation, trapping, translocation, construction, mitigation, management and monitoring. Works are scheduled to be undertaken between July 2014 and March 2016.

The potential impacts of the works/proposed development upon GCN are predicted to be:

These impacts have been separated into effects on the development area and effects on the mitigation area.

Development area impacts:

- Loss of suitable GCN terrestrial habitat
- Disturbance of GCN within the terrestrial habitat throughout the site
- Severance/fragmentation of links to existing GCN habitat/ponds
- Injury/mortality of GCN within development area

Mitigation area impacts:

- Damage/disturbance to remaining GCN habitats
- Disturbance of GCN within the terrestrial habitat throughout the site
- Disturbance of GCN in adjacent habitats
- Injury/mortality of GCN within mitigation area

The potential for the development to cause severance of a low importance weak link to a cluster of ponds to the east has been confirmed. This impact has been addressed within the GCN Modelling undertaken by the Amphibian and Reptile Conservation Trust. The loss of this link only reduces the overall landscape value by 0.01%. (Amphibian and Reptile Conservation Trust, Site C4 Abenbury Way, February 2014).

The mitigation which will be undertaken in order to minimise these impacts include:

- Creation of ponds to provide suitable aquatic habitat for GCN
- Creation of terrestrial habitat (native species scrub vegetation, brash, log piles, hibernacula) to increase opportunities for foraging, refuge and hibernation.
- Exclusion and translocation of development area

- Exclusion and RAMs of mitigation area
- Supervision of works by a licensed ecologist

B Introduction

TACP have been commissioned to prepare an application for a licence to disturb GCN as part of the Great Crested Newt translocation works for the proposed new industrial unit identified as Plot C4 within the Wrexham Industrial Estate (as detailed below).

This document provides information on potential impacts that may occur on the GCN population within the proposed development site and the surrounding area. Within this method statement, the potential impacts will be assessed and mitigation measures provided to ensure there is no adverse impact upon the species/population and to minimise the risk to Great Crested Newts.

The majority of the Great Crested Newt (GCN) mitigation work will be undertaken prior to the construction phase of the scheme, which will include vegetation clearance and translocation using exclusion fencing, pitfall traps and artificial refugia as shown on the GCN Exclusion Fencing Layout and Access Plan -2134/002. The mitigation and enhancement works will involve pond creation to the north of the construction site as well as hibernacula and refugia creation utilising material from the site vegetation clearance.

The Phase 1 habitat survey carried out by J W Ecological Ltd in 2013, identified a number of habitats within the site that have the potential to support protected species including Great Crested Newts. These suitable habitats include semi-improved grassland, scrub and woodland. One pond is located approx. twenty metres from the north-western boundary of the site with foraging and refuge areas adjacent to the pond and the site boundary. (JW Ecological, 2013)

Survey work including GCN population modelling undertaken by the Amphibian and Reptile Conservation Trust, identified an area of densely clustered ponds to the east of the proposed development site. No ponds will be lost as part of the proposed development of the C4 plot, and therefore no major impacts are expected.

The mitigation and enhancement works specified within this document will be undertaken prior to the trapping and translocation of GCN, and prior to the construction works.

B1 Background

The site is located on the north-western side of Abenbury Way, to the north-west of the existing Wrexham Industrial Estate area, in between Abenbury Way and Erilas Lane, as shown in the Ecological Mitigation Plan – 2134/001 Rev E.

The development plot comprises of a variety of habitats including semi-improved grassland, broad-leaved semi-natural woodland along the northern and southern site boundaries, dense/continuous scrub extending across the southern area of the site, and a watercourse located within the woodland to the south of the site.

Previous ground investigation works have been carried out in 2014 in order to identify the location of services along the eastern edge of the development plot. This work was carried out under Reasonable Avoidance Measures (RAMs) following hand searches of the site, and under the supervision of a suitably licenced and experienced ecologist as agreed with Matthew Ellis of Natural Resources Wales (NRW). No amphibians or GCN were found during the hand search of the site.

B2 Proposed Works on site to be covered by the Licence

Planning :

The proposed works are in reference to Planning Reference: ABE P/2014/0195 – Land at Abenbury Way, Wrexham Industrial Estate, Wrexham, LL13 9UZ. Outline Application for Industrial Unit and associated vehicular and pedestrian access

This GCN licence application relates to site preparation, trapping, translocation, construction and mitigation work, in relation to the development of Plot C4. Details are also given relating to the future management and monitoring requirements however these will not be covered by this licence. The proposed works to be included within this licence are as follows:

- Installation of amphibian exclusion fencing around the development area/one-way fencing surrounding the mitigation area
- Creation of four new ponds as suitable aquatic habitat
- Creation of suitable terrestrial habitat features including hibernacula and refugia (see Section E2.1 for further detail and Ecological Mitigation Plan 2134/001 Rev E)
- Trapping and translocation of GCN
- Vegetation clearance
- Earthworks
- Installation of a GCN underpass
- Maintenance of amphibian exclusion fencing around the development area/one-way fencing surrounding the mitigation area

The licence would cover all site works and areas including the mitigation areas to the northern end of the plot. A full trapping exercise will be undertaken within the exclusion area shown in Annex 1: GCN Exclusion Fencing Layout and Access Plan -2134/002 with alternating pitfall traps and artificial refugia (carpet tiles) located at 5m intervals along the boundary fence and drift fencing compartments over a minimum of 30 trapping visits during suitable weather conditions. Trapping will be completed by 10am each day or earlier depending on weather conditions. Any GCN or other amphibians caught during this exercise will be translocated to similar habitat within the mitigation area as shown on Annex 2: Ecological Mitigation Plan, 2134/001 Rev E. Trapping will continue until 5 consecutive clear visits have been achieved and agreement obtained from NRW that the trapping effort is sufficient. Following this, destructive searches will be undertaken by hand within the exclusion area before construction begins. Exclusion fencing will remain in place to prevent amphibians returning to the area prior to and during construction.

Once all of the separate compartment areas within the exclusion fencing are cleared, this will enable works, including vegetation clearance, to proceed within a newt-free area, and to progress under the supervision of a suitably qualified licenced ecologist.

The area proposed for creation of new aquatic habitat will require one-way fencing to be installed for a minimum period of two weeks prior to the start of habitat creation works to allow amphibians to leave the area before excavation works begin. The area will be hand searched prior to works, which will be carried out under the supervision of a suitable licenced and experienced ecologist.

C Site Assessment Information

C1 Existing information on GCN at the Site

GCN surveys have been undertaken previously in 2009, in relation to a separate scheme in the vicinity of the Wrexham Industrial Estate, located to the north east and east of the proposed site. These surveys identified the presence of a small population of GCN, with several ponds showing presence of GCN, with a peak count of 7, occurring over a period of six survey visits.

Surveys have identified Great Crested Newt presence within a pond 20m north-west of the site boundary.

These surveys provide information on the local GCN population and therefore that related to the site as a similar population number may be expected on the site, due to the similarity in terrestrial habitat and the small distance between the site boundary and an identified GCN pond.

C2 Statutory sites notified for the species within 10km

GCN are widespread throughout the local area, due to the availability of suitable terrestrial habitat.

Within 10km of the site boundary, there are ten sites identified as Sites of Special Scientific Interest (SSSI) and two sites as Special Areas of Conservation (SAC). Two sites (1 SAC and 1 SSSI) are designated for GCN.

The SAC sites are:

- Johnstown Newt Sites
- River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid

The SSSI sites are listed below:

- Stryt Las and Hafod
- Marford Quarry
- Vicarage Moss
- Sontley Marsh
- Gatewen Marsh
- Llay Bog
- Chwarel Singret
- Old Pulford brook meadows
- Cloy Brook pastures
- Afon Dyfrdwy (River Dee)

The designated sites for GCN and distance from the proposed works are detailed below:

- Johnstown Newt Sites SAC – 7km
- Stryt Las and Hafod SSSI- 7km

C2.1 LEGISLATION AND ECOLOGY

Legislation

The Great Crested Newt is protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of The Conservation of Habitats and Species Regulations 2010 (as amended). Therefore the GCN is considered as a European Protected species and subject to high level protection.

The legislation makes it an offence to:

- Intentionally kill, injure, take or sell GCN
- Damage, destroy, obstruct access to any structure or place used for shelter or protection
- Intentionally disturb them while occupying a structure or place of shelter

GCN are also subject to Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). Schedule 9 makes it an offence to:

- Intentionally kill, injure or take a GCN
- Possess or control any live or dead specimen or anything derived for a GCN
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a GCN
- Intentionally or recklessly disturb a GCN while it is occupying a structure or place

GCN are also a UK Biodiversity Action Plan (BAP) Priority Species and are listed as a Species of Principal Importance for Conservation of Biological Diversity in Wales under Section 42 of Natural Environment and Rural Communities (NERC) Act 2006.

This legislation has great importance upon construction and mitigation work to ensure that there are no adverse impacts towards GCN that could result in a breach of the legislation.

D Impact Assessment in Absence of Mitigation

The proposed development works could result in a number of potential impacts on Great Crested newts in the absence of mitigation. These impacts have been separated into short term and long term effects.

D1 Short-term Impacts

Potential short term pre-development impacts include:

- Injury/mortality of individual animals due to construction works
- disturbance to individuals and populations within the construction area
- disturbance to individuals and populations adjacent to the construction area
- temporary loss of terrestrial habitats due to construction works
- temporary isolation of terrestrial habitats due to construction works

As part of the development (construction phase), there may also be an increase in activity/noise levels and artificial light levels.

D2 Disturbance

Short Term Impacts:

Breeding Habitat

No ponds will be directly disturbed during the proposed works. The closest confirmed GCN pond is approximately 20m from the north western boundary, on the opposite side of Erlass Lane from the development. This pond is in poor condition with high turbidity levels and a lack of aquatic vegetation. The works will not impede into this area and best practice during the works will ensure minimal indirect effects, therefore this is considered to have no impact.

Due to the implementation of one way fencing around the mitigation area, links between this pond and possible breeding areas to the south of the development may be temporarily affected by these works. As such this is considered to be a minor impact.

Foraging/Hibernation Habitat:

Core habitats within 50m and intermediate habitats within 50-250m of a confirmed GCN breeding pond may be affected on a short term basis through barrier creation and disturbance associated with pond and refugia/hibernacula creation within the mitigation area. This is considered to be a minor impact.

Vegetation clearance of both the construction and mitigation areas have the potential to directly and indirectly impact GCN within terrestrial habitats including potential injury and mortality of GCN and is therefore considered to be a major impact.

Long Term Impacts:

Breeding Habitat

No ponds will be lost as part of the proposed works. As stated above the closest confirmed GCN pond is c20m from the north western boundary and is in poor condition. Although the proposed development will not result in the severance of a population, it could create a barrier to dispersal to existing populations to the west and suitable habitat features to the south resulting in a minor impact on GCN populations.

Foraging/Hibernation Habitat

The proposed site contains core and intermediate terrestrial habitat associated with a confirmed GCN breeding pond, which will be lost as part of the development resulting in a minor to moderate impact.

D3 Long term Impacts – Site modification

In the absence of mitigation it is considered that the proposed development could have a minor to medium level impact due to habitat modification within and adjacent to the proposed development plot. These impacts would result from the increased level of human activity and management and the associated increases in noise and light spill reducing the extent to which GCN would utilise remaining habitats on site and in the immediate area.

D4 Long term Impacts – Site Loss

No aquatic habitats are to be lost as a result of the proposed works however due to the loss of terrestrial habitat, it is considered that a low level of impact would be anticipated on GCN

populations within 50m of the proposed site. There would be a minor level of impact upon populations within 50-250m from the site, with no impacts predicted beyond this distance.

The Great Crested Newt Mitigation Guidelines (English Nature, 2001) state that 'Pond loss is often seen as the most damaging impact on great crested newt populations, but the loss of terrestrial habitat can also have serious consequences'. The majority of the suitable foraging and hibernation terrestrial habitat on site will be replaced by built land resulting in the loss of approximately 8820m² of habitat including semi-improved grassland, woodland and scrub. It is assessed that there would be a medium level of impact on terrestrial habitat within the immediate range and a minor impact upon the intermediate and distant terrestrial GCN habitat and dispersal corridors/links to other ponds/GCN populations.

D5 Long term Impacts – Fragmentation and Isolation

In the absence of mitigation measures, it is considered that the loss of suitable terrestrial habitat and the severance of dispersal corridors will have a minor level impact upon GCN populations within the wider area. Fragmentation effects will include the loss/severance of a low importance weak link to a cluster of ponds to the east, which crosses through the middle of the C4 plot as identified by the Amphibian and Reptile Conservation Trust (Amphibian and Reptile Conservation Trust, Site C4 Abenbury Way, February 2014).

The confirmed GCN pond located 20m north-west of the site may be impacted by fragmentation due to the new development. This is assessed as a medium level impact.

D6 Post development interference impacts

There is potential for GCN to attempt to re-inhabit the development area and features such as drainage, car parks/vehicular access areas, resulting in trapping of GCN and possible injury and mortality increase. With the absence of mitigation, it is considered there would be a medium impact level of post development interference.

There will also be on-going disturbance effects on the remaining terrestrial habitat areas through increased human activity, lighting and noise resulting from the operation of the development. This will be a particular issue as the development is to be in operation 24 hours increasing the potential for such disturbance to occur.

D7 Predicted Scale of Impact

In the absence of mitigation measures, it is considered that there will be a medium level of impact on the GCN population at site level and a low level of impact to the local population within 50-250 m of the proposed works. It is also considered that due to the isolated nature of the site, there will only be a minor impact within 2km, with no significant impacts identified on a wider county, regional and country level.

E Works to be undertaken or supervised by a licensed ecologist

E1 Great Crested Newt capture and exclusion

GCN exclusion fencing will be erected around the area proposed for development works, to the north of Abenbury Way. The fencing layout plan is shown in Annex 1: GCN Exclusion Fencing Layout and Access Plan -2134/002. Fencing will be erected around the perimeter of the site, with drift fencing erected within this area in order to split the proposed development site in to compartments, therefore improving the capture rates and ensuring

GCN removal from the site. A minimum of 30 trapping visits using pitfall traps and artificial refugia situated every 5m, under suitable weather conditions will then be undertaken. Capture will be continue following completion of these 30 trapping visits until 5 consecutive clear trapping visits have been reached with no GCN found. Following this and with agreement from NRW destructive searches will be undertaken prior to the start of construction.

Upon completion of the capture period, the inner drift fencing will be removed, in order to allow access for works. However the perimeter exclusion fencing will be retained throughout the pre and during construction periods to prevent GCN from returning to the cleared site area and will only be removed with agreement from NRW.

Capture Methods

Pitfall traps and artificial refugia will be installed along the inside of the exclusion and compartment drift fencing. The pitfall traps will be installed at 5m intervals, with artificial refugia placed between these, in order that there is a trap/refugia present every 2.5m. The density of pitfalls traps and artificial refugia will maximise the capture of GCN. The pitfall traps will be installed at ground level with a mammal ladder present within each trap and a flotation device in order to protect newts and any other amphibians/species that may become trapped, should the pitfall trap be flooded due to high rainfall levels.

The exclusion fencing will be inspected on a daily basis and any repairs will be made within 24 hours. A record of the fence inspection and the repair work to fix the damage will be kept by the licence holder or their appointed representative in order to ensure that the newt fencing is being properly maintained.

Pitfall traps will be left open overnight and checked, along with the artificial refugia, the following morning by no later than 10am. Captures during trapping will be recorded, with notes made regarding location (compartment and trap/refugia number) and species, sex and size.

After the traps have been checked during the morning, the lids will be closed during the day and the traps will be re-opened in the afternoon ready for the night time capture.

Any GCN or other animals that may be captured will be moved to the mitigation site, outside of the bounds of the exclusion fencing as shown on Annexes 1 and 2. These will be translocated using suitable containers (with lids and air-holes).

Pitfall traps will be open every night unless there is an indication of poor weather conditions or the overnight temperatures fall below zero degrees. Checks will be completed earlier during period of hot, dry weather.

Once capture of GCN has been completed, daily inspections of the perimeter exclusion fencing will continue and again repairs made within 24 hours, with full records and logs kept.

E2 Great Crested Newt Habitat

E2.1 Receptor site modification, enhancement or creation

The mitigation and enhancement proposals for the development involve the creation of terrestrial and aquatic habitats suitable for GCN including the creation of the following approximate areas:

- 3125m² of species rich grassland
- 1618m² of scrub planting belts
- 370m² of pond area across 4 ponds
- 196m² of hibernacula/refugia (soil/clean rubble)

All these features will provide suitable foraging and hibernation habitat within the mitigation area, and in close proximity to potential terrestrial and aquatic habitats to the north of the site boundary.

Aquatic Habitats

Within the proposed mitigation area to the north of the site, four new ponds will be created at an approximate surface area of 100m² each. Ponds will have a depth of approximately 1m and have sloping/stepped sides with shallow margins. The sloping sides will provide suitable access/egress for amphibians including GCN.

The creation of the four ponds introduces a new link and opportunity to the existing population within the Wrexham Industrial Estate area, as well as strengthening the link to the ponds to the east of the proposed development (shown in Appendix 3 of the ARC Modelling Report, Feb 2014).

Terrestrial Habitats

The scrub planting will be located along the boundaries of the proposed area of hard standing to allow connectivity and provide wildlife corridors around the site.

Species rich grassland will be created within the mitigation area in order to increase floral diversity, as well as between the two areas of car parking to allow for retention of trees and allow for wildlife areas within the completed site.

Soil mixed with clean rubble will be used to create refugia and hibernacula within the mitigation area to the northern end of the site particularly around the edges of the newly created ponds.

E2.2 Temporary loss of breeding sites, resting places

There will be no temporary losses associated with the construction works either directly or indirectly.

It is considered that due to the nature of the mitigation works, a precautionary approach using one way fencing and destructive searches will be adopted with working procedures which minimise the risk of causing an offence to GCN while negating the need for a full exclusion and translocation exercise to be undertaken. Mitigation and enhancement works would be carried out under Reasonable Avoidance Measures as detailed below. This will

constitute a temporary loss of habitat, but only for the duration of the mitigation works plus the two weeks prior once the fencing has been installed.

One way fencing will be installed for a minimum period of two weeks to allow GCN to leave the area while preventing their return. Prior to commencement of mitigation works, hand searches will be undertaken by licensed ecologists to further ensure that no GCN are present. A licensed ecologist will provide advice to works staff throughout the works, including supervising the creation of the ponds, earth banks (using arisings from the pond excavations) and hibernacula and refugia. Any arisings from these excavations that are not used to create hibernacula and refugia, will be situated in a suitable identified location within the development area (as shown in Annex 1: GCN Exclusion Fencing Layout and Access Plan, 2134/002.) providing these are compacted to ensure they are unsuitable habitat for amphibians and reptiles, and therefore compliant with the legislation. The area proposed for storage of excess soil within the development plot will be searched by licensed ecologists prior to movement of soil to further ensure that no GCN are present and works will be undertaken under relative avoidance measures (RAMS), including licensed ecologists providing sign off for the compaction of stored arisings. This has been agreed with NRW and a licensed ecologist will provide advice to works staff on this issue when necessary.

Vehicular access will be restricted within the mitigation area, in order to reduce the potential impacts on and disturbance to the retained habitats.

E2.3 Destruction of existing breeding, resting places

There will be no destruction of existing breeding habitat, as there is no aquatic habitat present within the development site or mitigation area, although the proposed works are being undertaken within approximately 20m of an identified GCN pond.

The proposed development may impact upon potential resting places, as removal of grassland, woodland and scrub will occur as part of the vegetation clearance works.

There will be no permanent loss of habitats within the mitigation area.

E2.4 Scaled Maps/Plans

The exclusion and one way fencing plans are detailed within Annex 1: GCN Exclusion Fencing Layout and Access Plan, 2134/002.

The proposed development and mitigation measures are shown in Annex 2: Ecological Mitigation Plan, 2134/001 Rev E.

The pond arrangement plan detailing the contours and layout of the ponds and earth mounds are shown in Annex 3: Pond General Arrangement, 2134/ SK003.

The site location plan showing the location of the Abenbury Way site in relation to the wider area is shown in Annex 4: Site Location Plan, 2134/004.

E3 Measures for ensuring delivery of mitigation and compensation areas

E3.1 Measures to ensure compliance with this method statement

All of the mitigation and enhancement works and the construction works will be completed in agreement with and under supervision of suitable qualified and licenced ecologists. A

daily log will be maintained and records kept of the works undertaken, searches made and animals captured and translocated. Photo logs will also be kept where appropriate.

All fencing checks throughout the capture exercise and mitigation works and the construction works will also be recorded within a fencing log. Daily checks will also continue while no works are being undertaken on site between the capture exercise and construction works and recorded within a fencing log. This will include an audit trail for daily checks and a record of all repairs made. These checks will be undertaken by the licensee or their appointed representative.

The exclusion and translocation exercise to be undertaken across the development area will be undertaken by suitable qualified and licenced ecologists and full records kept of all animals captured and translocated.

E3.2 Ensure that sufficient land has been acquired for compensation purposes

An area at the northern end of the site has been set aside for the purpose of mitigation, alongside the area of grassland and retained trees to the southern end of the site, between the car park and the building. In total approximately 1716m² of land will be provided for terrestrial and aquatic habitat mitigation.

E3.3 Ensure that designs of development/subsequent development are newt friendly

The following design features have been proposed to ensure that the development will be newt friendly and to ensure protection measures have been considered for amphibians post development:

- Installation of a Great Crested Newt underpass (shown in Annex 2: Ecological Mitigation Plan) allowing newts/amphibians to disperse safely from the western boundary to the grassland on the eastern side, therefore reducing the fragmentation and isolation impacts
- Suitable features surrounding drainage areas to ensure no newts are accidentally captured and to allow safe passage for newts within the development site.
- Use of amphibian friendly drainage design
- Careful design of lighting to minimise light spill into adjacent areas where newts may be present.
- Use of suitable landscape planting to further minimise light and noise disturbance and provide additional cover for GCN

E3.4 Provision of sufficient resources for effective site management

The Welsh Government (WG), the landowner, will be responsible for ensuring that management of the mitigation area is undertaken until such time as the site is sold to the prospective developer. The WG management regime will be delivered through the Welsh Government Contractor Framework, such as that provided at St. Asaph Business Park, which meets the requirements and approval of Natural Resources Wales (NRW).

Prior to the sale of the plot for development, and in agreement with the purchaser, the arrangements for the ongoing delivery of a long-term management regime will be submitted to the LPA and NRW for agreement and approval.

E4 Mitigation Contingencies

In the event that GCN are disturbed outside of the works area, works will stop and a licenced ecologist and NRW will be consulted on further measures to be undertaken.

E5 Biosecurity Risk Assessment

Information regarding biosecurity has been included within the Risk Assessment Table provided within Annex 7.

All required biosecurity measures will be undertaken in order to ensure that the risk of spreading Invasive Non-native Species (INNS) is minimised and that all staff working on site are aware for the potential for spreading disease which may affect terrestrial and aquatic habitats.

E6 Ecological compliance audit performance indicators

A number of performance indicators are required as part of an assessment of ecological compliance. These are listed below:

- A copy of the GCN licence documents available on site
- A licenced ecologist overseeing site works at the required level
- Site works supervised by ecologists (those listed as accredited agents or assistants only)
- Necessary site management and/or monitoring plans have been produced and implemented correctly
- All avoidance measures are being applied as required
- All necessary licence permits are completed as necessary
- Any changes required to the licence methodology are addressed appropriately including stopping of works and consultation with NRW/WG
- Confirmation that all site staff have been inducted
- Confirmation that all site staff have received the necessary tool box talks
- All exclusion and one way fencing checks and repairs undertaken and recorded within the fencing log
- Habitat creation works implemented correctly

These performance indicators will be used to assess the overall performance of the project while the audit will ensure that the mitigation meets the minimum required standards and legal requirements. Regular checks of the works areas, as part of the ecological audit, will be undertaken as per the agreed frequency (dependent on site activities).

An ecological compliance audit has been drafted included in Annex 8.

F Post Development site safeguard

F1 Habitat/Site management and maintenance

The Welsh Government/respective future owners of the site will be responsible for the ongoing land management, maintenance and wardening including running costs and monitoring. Suitably qualified personnel (facilitated by organisations experienced within this field), will ensure the maintenance of the existing mitigation area over a long term period. If this changes then NRW will be notified as soon as possible.

F2 Population Monitoring

Post development monitoring of the terrestrial and aquatic habitat will be undertaken by suitably qualified and experienced ecologists for a minimum of 21 years post construction. This monitoring will provide important data of local GCN population size.

The following monitoring is proposed, in accordance with the Great Crested Newt Mitigation Guidelines.

- Annual condition assessment of new aquatic and terrestrial habitats to be undertaken in May/June each year with the results used to inform the need for management actions such as pond clearance, mowing regimes and replacement planting
- Population class assessments requiring six survey visits between mid-March and mid-June with at least three between mid-April to mid-May) using a minimum of three different survey techniques. This would be conducted in Years 1, 3, 5, 8, 11, 14, 17 and 21 post construction (unless otherwise agreed with NRW) at which point the management plans should be reviewed.

F3 Post-development mitigation contingencies

Where the monitoring detailed above identifies that any measure is not successful, only partially successful or where impacts are greater than predicted, additional measures will be put in place in consultation with NRW and other relevant bodies and specialists. These measures will also be subject to ecological monitoring and the results used to determine and ensure success (or detail further measures required if necessary).

F4 Mechanism for ensuring delivery of post-development works

Post development management of the mitigation area and habitats surrounding the development site will be undertaken over a long term period of a minimum of 21 years. It is currently anticipated that the management of the mitigation area will be managed by suitably qualified personnel (facilitated by organisations experienced within this field). This will be undertaken in accordance with the management plans to be produced for the site.

G Timetable of works

Activity	Timing	Notes
Commencement of installation of exclusion/one-way fencing	September 2014	Following granting of GCN Licence
Commencement of mitigation works on site	September/October 2014	Following installation of one way fencing and 2 week period to allow amphibian and GCN dispersal. To be completed prior to the hibernation period

Commencement of Trapping/Translocation of GCN	September/October 2014	30 day period under suitable weather conditions
Vegetation clearance of development area	November 2014/2015	
Start of construction works on site	March 2015	
Completion of construction works	March 2016	Fencing to be removed following agreement from NRW

Construction works are programmed for completion in March 2016, which will be followed by a post development 21 year monitoring, management and maintenance period, undertaken by the relevant organisations as stated in Section F.

H Land Ownership – Mitigation Site

H1 Mitigation Site Ownership

The area of habitat for creation and modification are located on land owned by the Welsh Government. The Welsh Government/respective future owners of the site will be responsible for funding all work described in Section F. Mechanisms that will ensure delivery of post-development works and monitoring to ensure maintenance of the GCN population in the long-term have been described in Section F. Within 12 months of issue of the licence, the Welsh Government will identify the long term ownership of the site, and NRW will be notified.

H2 Mitigation Site Ownership post construction

The area of habitat for creation and modification are located on land owned by the Welsh Government. The Welsh Government/respective future owners of the site will be responsible for funding work described in Section F. Mechanisms that will ensure delivery of post-development works and monitoring to ensure maintenance of the GCN population in the long-term have been described in Section F.

H3 Project Liaison post development

Within 12 months of the issue of the licence, the Welsh Government will identify the long term ownership of the site, as well as including the identity of the personnel undertaking the management, maintenance and wardening of the site on a long term basis. The Welsh Government will inform NRW regarding the change of ownership.

Post development monitoring and management of the mitigation area and surrounding habitats will be undertaken on a long term basis. Suitably qualified personnel (facilitated by organisations experienced within this field), will undertake management of the mitigation area once development has been completed for a minimum of 21 years.

Suitably qualified and licenced ecologists will undertake monitoring of the mitigation area in accordance with the Great Crested Newt Mitigation Guidelines. The proposed monitoring measures are detailed in section F.2.

Following the completion of the mitigation site and post development monitoring visits, an annual report will be produced and provided to Natural Resources Wales (NRW) and Wrexham County Borough Council (WCBC). These reports will ensure ongoing communication and ensure that the proposed monitoring was undertaken in accordance with this method statement (See Section F2) and the Great Crested Newt Mitigation Guidelines.

It is proposed that annual reports will be provided to Natural Resources Wales and Wrexham County Borough Council, and quarterly liaison meetings would be conducted in order to ensure ongoing communication. Ecological Compliance Audit information will be provided to Natural Resources Wales and Welsh Government as a component of the reporting. A GIS layer identifying the location of the compensation/mitigation site will be sent to Wrexham County Borough Council, North Wales Environmental Information Service (Cofnod), and the Amphibian and Reptile Conservation Trust (ARC).

I References

Amec Earth and Environmental UK Ltd (2011) *Wrexham Industrial Estate Access Road, Southern Route Road Scheme, Method Statement for mitigation of impacts on Great Crested newts during main works contract*

English Nature (2001) *Great Crested newt mitigation guidelines*

Fletcher D.H., French G.C.A & Wilkinson J.W. (Amphibian and Reptile Conservation Trust) (2014) *Site C4 Abenbury Way, Wrexham – Comparative modelling of impacts on great crested newts to inform planning*

JW Ecological Ltd (2013) *Ecological Assessment – Plot C4 Abenbury Way, Wrexham Industrial Estate*

TACP Ltd (2014) *Wrexham Industrial Estate – Reasonable Avoidance Measures for Great Crested Newt Mitigation Work*

J Annexes

Annex 1: GCN Exclusion Fencing Layout and Access Plan -2134/002

Annex 2: Ecological Mitigation Plan, 2134/001 Rev E.

Annex 3: Pond General Arrangement, 2134/ SK003.

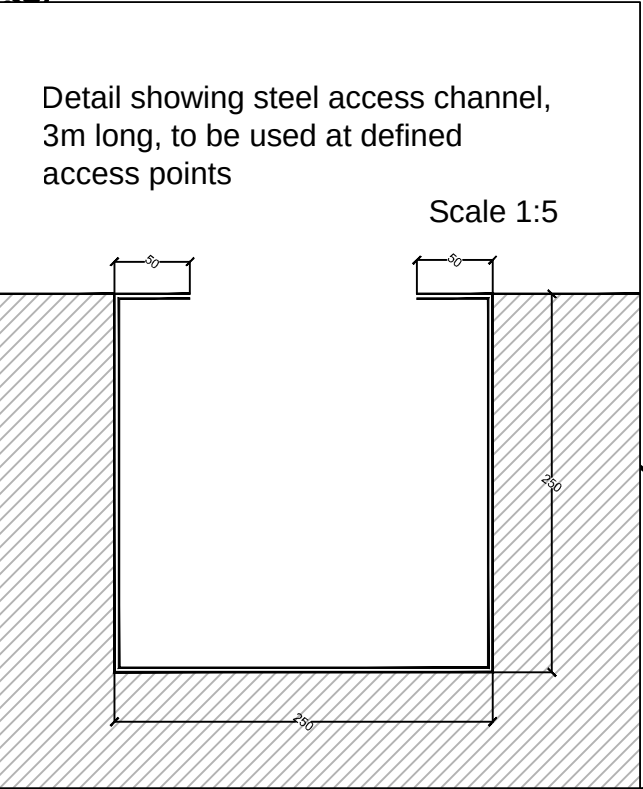
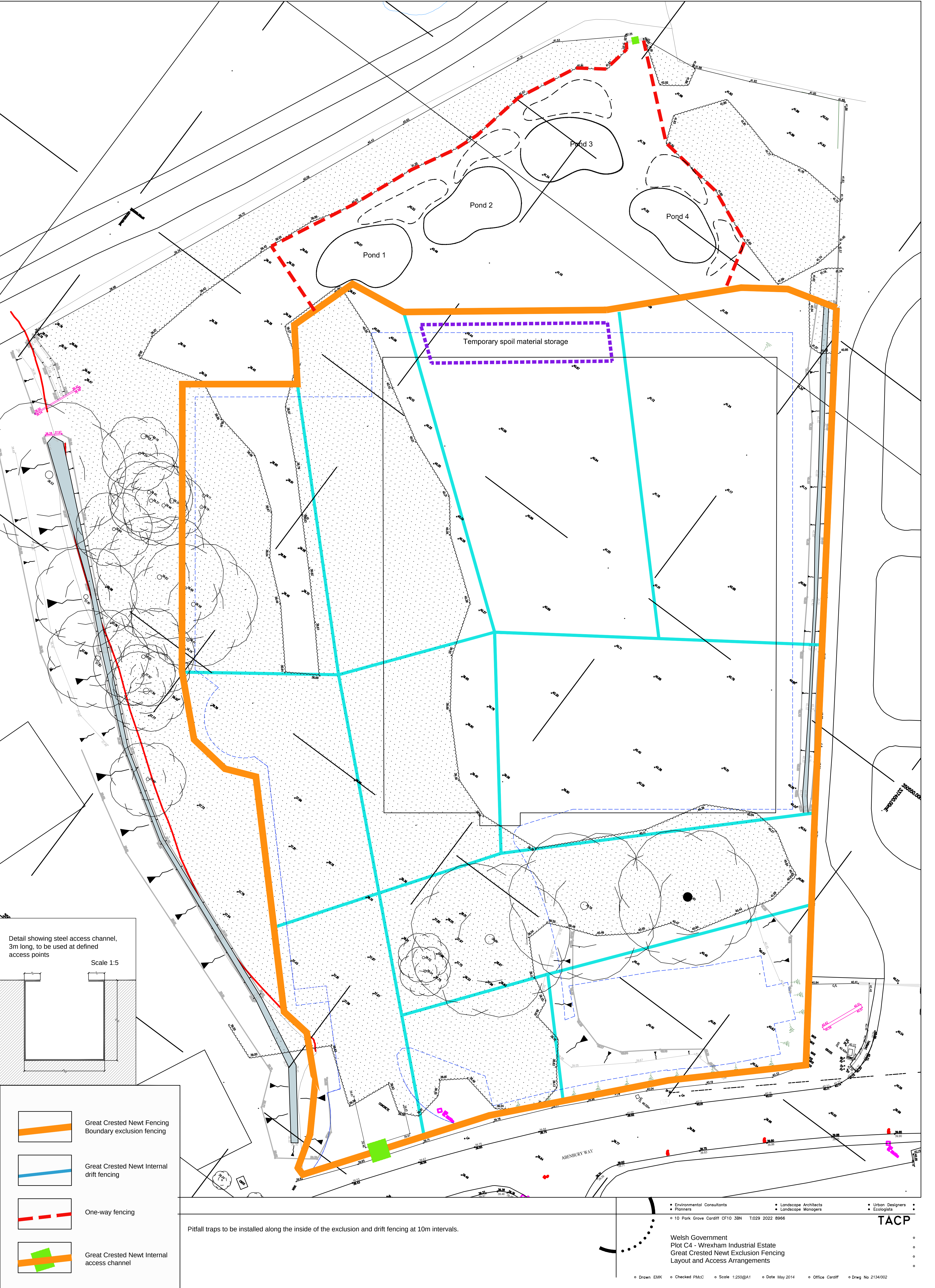
Annex 4: Site Location Plan, 2134/004

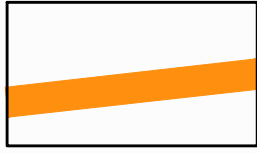
Annex 5: JW Ecological Ltd (2013) *Ecological Assessment – Plot C4 Abenbury Way, Wrexham Industrial Estate*

Annex 6: Fletcher D.H., French G.C.A & Wilkinson J.W. (Amphibian and Reptile Conservation Trust) (2014) *Site C4 Abenbury Way, Wrexham – Comparative modelling of impacts on great crested newts to inform planning*

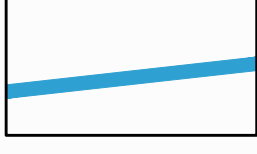
Annex 7: Biosecurity Risk Assessment

Annex 8: Ecological Compliance Audit Form

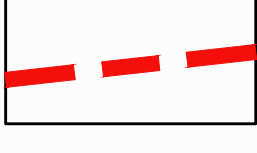




Great Crested Newt Fencing Boundary exclusion fencing



Great Crested Newt Internal drift fencing



One-way fencing



Great Crested Newt Internal access channel

Pitfall traps to be installed along the inside of the exclusion and drift fencing at 10m intervals.



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Landscape Architects
Landscape Managers

Urban Designers
Ecologists

Welsh Government
Plot C4 - Wrexham Industrial Estate
Ecological Mitigation

Drawn EMK
Checked PMcC
Scale 1:250@A1
Date Jan 2014
Office Cardiff
Drwg No 2134/001 rev E



Legend

Site Location

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NOTES

TACP
10 Park Grove, Cardiff CF10 3BN
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admin@tacp.co.uk

**Wrexham Industrial Estate
Land at Abenbury Way
Site location plan**

◦DRAWN JB ◦CHECKED PMCC ◦OFFICE : CARDIFF
◦NOT TO SCALE ◦DATE JUNE 2014

FIGURE / DRAWING NO. 2134/004	REV --
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Ecological Assessment

**Plot C4, Abenbury Way,
Wrexham Industrial Estate**

Ref: JWE/1368

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Date: 12/06/13	Date: 12/06/13

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THIS REPORT REPRESENTS AN INITIAL ECOLOGICAL ASSESSMENT OF THE SITE. FURTHER SURVEYS, AS DESCRIBED IN THE CONCLUSIONS SECTION, MAY NEED TO BE IMPLEMENTED PRIOR TO THE SUBMISSION OF A PLANNING APPLICATION. ECOLOGICAL ISSUES ARE A MATERIAL CONSIDERATION IN DETERMINING PLANNING APPLICATIONS AND ALL RELEVANT SURVEYS MUST BE COMPLETED PRIOR TO APPLYING FOR PLANNING PERMISSION.

PLEASE NOTE THAT WHILST EVERY EFFORT HAS BEEN MADE TO ENSURE THAT THE CONTENT OF THIS REPORT IS ACCURATE THE SURVEY REPRESENTS ONLY A SNAPSHOT IN TIME AND THE ECOLOGICAL ISSUES ON SITE MAY CHANGE. THE ADDITIONAL SURVEY WORKS RECOMMENDED IN THIS REPORT ARE WHAT IS THOUGHT TO BE REQUIRED IN THE OPINION OF THE SURVEYOR, THE LOCAL PLANNING AUTHORITY OR NATURAL RESOURCES WALES MAY IN SOME CASES REQUEST ADDITIONAL INFORMATION NOT OUTLINED IN THIS REPORT.



1.0 INTRODUCTION

- 1.1 J W Ecological Limited were commissioned in May 2013 to undertake a baseline ecological assessment of an area of land on the north-western side of Abenbury Way, Wrexham Industrial Estate, Wrexham (SJ 37374 50548). The survey area is shown on drawing D/JWE/1368/001 (Appendix 1).
- 1.2 The aims of this ecological assessment were to:
- Assess and describe the Valuable Ecological Components (VECs) of the proposed development site and all land within 250 metres (referred to as “the wider survey area”).
 - Assess the likely ecological impacts of the development.
 - Identify further survey and mitigation requirements
 - Identify ecological features of the site that should be protected
 - Provide guidance as to ecological enhancement of the site
- 1.3 To meet the aims of the ecological assessment the following actions were undertaken:
- Desktop study of all land within 500 metres of the development site
 - Extended phase one habitat survey of the development site and adjacent land
- 1.4 The sites ecological value was assessed in context with current UK planning and legislative policy, including:
- Protected sites (statutory and non-statutory)
 - Statutorily protected species
 - UK and local Biodiversity Action Plan (BAP) species
 - Species and habitats of local concern
 - Local wildlife strategies
- 1.5 Prior to any survey work a health and safety risk assessment of the site was undertaken. Risk assessments are undertaken on a site by site basis in order to identify potential risks with the aim to reduce these as far as is practicable.

2.0 SITE LOCATION AND DESCRIPTION

- 2.1 The site is located on the north-western side of Abenbury Way, to the north-west of the Wrexham Industrial Estate.
- 2.2 The survey area comprises a semi-improved grassland meadow with a band of mature woodland extending along the western and southern site boundaries. A small watercourse extends along the southern boundary of the site within the woodland area. A band of dense scrub extends across the survey part of the site.
- 2.3 The site is bordered by industrial buildings and associated access roads and hard-standing areas to the north, east and south. Erilas Lane is located outside of the western site boundary with improved grassland fields beyond.
- 2.4 The proposals for the site will involve a new industrial building and associated areas of hard standing.



3.0 DESKTOP STUDY

- 3.1 Ecological data and records of protected species were requested/gathered from the following sources (Table 1):

Table 1: Desktop Study Sources

Consultee/Source of Information	Information Supplied
NBN Gateway	Protected species records within 1 kilometre of the proposed development site.
Natural Resources Wales	Online protected sites register.
Cofnod	Protected species and protected sites within 1 kilometre of the survey area.
UK Biodiversity Action Plan	Identification of national priority species and habitats known to occur in the region.
Local Biodiversity Action Plan	Identification of local priority species and habitats known to occur in the area.

Protected Sites

- 3.2 No statutorily designated nature conservation sites are located within 1 kilometre of the survey area.
- 3.3 The Erlas Wood (Wrexham Industrial Estate) Wildlife Site is located approximately 370 metres south-east of the survey area and the Big Wood Wildlife Site is located approximately 530 metres south-west of the site.

Protected Species

- 3.4 Cofnod hold numerous records of Great Crested Newts in the ponds within and around the Wrexham Industrial Estate. The closest of these records is for a pond located on the western side of Erlas Lane, 20 metres west of the survey site.

Bat species including Whiskered bat and Pipistrelle have been recorded within 1 kilometre of the survey area.

Slow Worm and Adder have been recorded associated with the Redwither Brook corridor.

Badgers are known to be present in the area.

The UK and Local Biodiversity Action Plan (BAP) species Grizzled Skipper and Dingy Skipper have both been recorded at a number of locations within the Wrexham Industrial Estate.

- 3.5 Full details of the Cofnod search are provided in Appendix 4.



3.6 Based on information gathered from the sources listed above and desk based assessment of the site from OS maps and aerial photographs the following protected species were taken into account during the site assessment:

- Bats (all species)
- Great crested newt (*Triturus cristatus*)
- Badger (*Meles meles*)
- Water Vole (*Arvicola terrestris*)
- Otter (*Lutra lutra*)
- Reptiles (all species)

UK Biodiversity Action Plan (UKBAP) Priority Species

3.7 The UKBAP priority species which may potentially use the survey area, based on the results of the desktop study are:

- Mammals – Bats*, Badgers*, Hedgehog;
- Birds – Song Thrush, Sky Lark etc.
- Amphibians – Great Crested Newts*, Common Toad.
- Invertebrates – Dingy Skipper, Grizzled Skipper.

** These species and/or their habitats are also statutorily protected*

Local Biodiversity Action Plan (LBAP)

3.8 The Wrexham Biodiversity Action Plan (BAP) lists key local species and habitats considered to be rare or declining in the area. Some of these species and habitats may also be of national concern.

3.9 Although local BAP documents have no legal status the Local Planning Authority (LPA) and Natural Resources Wales will expect the listed species and habitats to be taken into account in the overall layout and landscape strategy for the development.

3.10 The species of local concern which may potentially utilise the survey area based on the results of the desktop study are:

- Mammals – Badger*, Otter*, Lesser Horseshoe bat*, Hedgehog;
- Amphibians – Great Crested Newts*;
- Birds – Barn Owl*;
- Reptiles – All species*;
- Invertebrates – Dingy Skipper, Grizzled Skipper.

** These species and/or their habitats are also statutorily protected*

3.11 Derelict and industrial land is listed as a habitat in the Wrexham Biodiversity Action Plan.



4.0 PLANNING CONTEXT

Planning Policy Wales (Edition 3, July 2010)

- 4.1 This document contains current land use planning policy for Wales. It provides the policy framework for the effective preparation of local planning authorities' development plans. This is supplemented by 21 topic based Technical Advice Notes (TANs). Procedural guidance is given in Welsh Office / National Assembly for Wales / Welsh Assembly Government circulars
- 4.2 Technical Advice Note 5 provides advice about how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation. This guidance note should be read in conjunction with *Planning Policy Wales (2002)*, in particular with Chapter 5 *Conserving and Improving the Natural Heritage and Coast* which sets out the Assembly Government's objectives for the natural heritage and the land use planning policies which support these.
- 4.3 This TAN brings together advice on sources of legislation relevant to various nature conservation topics which may be encountered by local planning authorities. Chapter 2 sets out the key principles of planning for nature conservation. Chapter 3 provides advice about the preparation and review of development plans, including the relevant statutory requirements. Chapter 4 addresses nature conservation in development control procedures. Chapter 5 deals with the conservation of internationally and nationally designated sites and habitats and also covers local sites. Chapter 6 deals with the conservation of protected and priority species.

5.0 LEGISLATIVE CONTEXT

- 5.1 This is a brief summary of the ecological legislative context in Wales. This is general advice only and does not relate specifically to the site being assessed.

Ecological Assessments

- 5.2 Ecological assessments have now become an important part of the planning process. This initial assessment is used as a means of identifying any specific interests of the site in question which are in turn used to assess suitability for protected species and to make recommendations for further survey work and mitigation.

Statutory Designated Sites

- 5.3 Sites with Statutory designations receive varying degrees of legal protection under UK law and European Directives. A number of statutory designations are used for sites of high conservation value in the UK dependent on the importance of the site at a local, regional, national and international level. These designations are:
 - Special Area of Conservation (SACs)
SACs are sites of European importance for nature conservation. These receive legal protection under the EC Habitats Directive (1992) which was incorporated into UK legislation through the Conservation (Natural Habitats, &c) Regulations 1994. In the UK all SACs are also designated as SSSIs.



- Special Protection Areas (SPAs)
SPAs are sites of European importance for birdlife as designated under the Birds Directive. As with SACs all SPAs in the UK will also be designated as SSSIs.
- Ramsar Sites
These sites are wetlands of international importance designated under the Ramsar Convention 1971. In most cases these sites are also designated as SPAs or Sites of Special Scientific Interest (SSSI) and receive legal protection in the UK through these designations.
- Sites of Special Scientific Interest (SSSI)
SSSIs are UK sites of national importance for nature conservation. These sites may be designated as a result of the habitats present or for the presence of rare species or species assemblages. SSSIs receive some legal protection through the Wildlife and Countryside Act 1981. This protection was recently extended through the Countryside and Rights of Way (CROW) Act 2000.
- National Nature Reserves (NNR)
NNRs are nationally important nature reserves designated by CCW under the Wildlife and Countryside Act 1981. These sites will either be managed by CCW or an approved body and are often designated as SSSIs.
- Local Nature Reserves (LNR)
Local Nature Reserve is a statutory designation made by local authorities under the Section 21 of the National Parks and Access to Countryside Act 1949. These sites may or may not be SSSIs.

Non-Statutory Designated Sites

- 5.4 Non-statutory sites are afforded no statutory legal protection but are in most cases recognised by local planning authorities and statutory agencies as being of local conservation value. The protection of these sites is usually afforded through Local Plan Policies (county, district and Unitary Development Plans) and these sites will in most cases be taken into account as a material consideration by the local authority when deciding planning applications. These sites are designated by the local authority (usually in consultation with the local Wildlife Trust and other agencies).

Protected Species and their Habitats

- 5.5 In the majority of cases relevant to planning applications protected species are those listed in Schedules 1, 5 and 8 of the Wildlife and Countryside Act (as amended), the Protection of Badgers Act 1992 and the Habitats & Species Regulations 2010. The extent of legal protection varies between species, as do the implications for developments where these species are to be affected.



5.6 Great Crested Newts

Great Crested Newts (*Triturus cristatus*) are protected under Regulation 41 of The Conservation of Habitats and Species Regulations 2010 and Section 9 of the Wildlife and Countryside Act 1981 (as amended), being listed in Schedule 5 of the act. Under the legislation it is an offence to:

- Intentionally kill, take or injure a great crested newt;
- Damage, destroy or obstruct a place a great crested newt uses for breeding, resting, shelter or protection or to disturb a great crested newt in such a place.
- Possess or control a great crested newt alive or dead, or any part of them, or anything derived from them.
- Sell, offer for sale, advertise for sale or offer to buy a great crested newt, or a part of them or anything derived from them.
- Deliberately disturb or deliberately take or destroy the eggs of a great crested newt.

Offences under Section 9 carry a maximum penalty of a fine up to £5000, imprisonment for up to six months, or both, for each animal in respect of which an offence is committed.

Licenses can be issued in order to allow activities that would constitute an offence under the legislation. Licenses can be issued for specific purposes including scientific study, photography, conservation management and development.

It is important to identify the presence of great crested newts as early as possible in a development so that the legal obligations regarding this species can be observed. If surveys identify the presence of great crested newts on site a mitigation scheme must be developed in consultation with the local CCW team. This mitigation scheme must minimise direct threats to newts and compensate for any habitat loss. A licence issued by the Welsh Assembly is required before the mitigation scheme can be legally implemented. Mitigation licence applications require full Method Statements and a Reasoned Statement of Application. The method statement contains details of the proposed mitigation works whilst the Reasoned Statement must provide justification as to how the proposed development meets the requirements of the legislation.

5.7 Bats

All species of bat and their breeding sites or resting places (roosts) are protected under Regulation 41 of The Conservation of Habitats and Species Regulations 2010 and Section 9 of the Wildlife and Countryside Act 1981 (as amended). Under the legislation it is an offence to:

- intentionally kill, injure or handle a bat;
- to possess a bat (whether live or dead)
- disturb a roosting bat;
- sell or offer a bat for sale without a licence;
- damage, destroy or obstruct access to any place used by bats for shelter, whether they are present or not.

The potential fine for each offence is £5,000. If more than one bat is involved, the fine is £5,000 per bat. An offender can also be imprisoned for up to six months.

Where bats are found to occur on a development site, and there is considered to be a reasonable possibility that a roost may be damaged or destroyed or that bats using a roost will be disturbed, a licence must be obtained from Welsh Assembly.



5.8 Badgers

Badgers (*Meles meles*) and their habitat are protected under The Protection of Badgers Act 1992 and are also included on Schedule 6 of the Wildlife and Countryside Act 1981, and Appendix III of the Bern Convention. The legislation affords badgers protection against deliberate harm or injury making it an offence to:

- wilfully kill, injure, take, possess or cruelly ill-treat a badger (or attempt to do so)
- to interfere with a sett by damaging or destroying it
- to obstruct access to, or entrance of, a badger sett
- to disturb a badger whilst it is occupying a sett

Penalties for offences include fines of up to £5000, plus up to six months imprisonment, for each illegal sett interference, badger injury or death.

Works that disturb badgers whilst they are occupying a sett are illegal without a licence. Disturbance can occur even without direct interference or damage to the sett in question. In general, the following activities are likely to require a licence:

- Use of heavy machinery or significant earth moving within 30m of a sett
- Use of lighter machinery (usually any wheeled vehicles) within 20m of a sett
- Any digging, chain saw use or scrub clearance within 10m of a sett

5.9 Reptiles

All species of British reptile are protected against intentional killing, injury or sale under the Wildlife and Countryside Act 1981 (as amended). The Sand Lizard and the Smooth Snake are afforded a higher degree of protection under Regulation 41 of The Conservation of Habitats and Species Regulations 2010 making it an offence to:

- Intentionally kill, take or injure these species of reptile;
- Damage, destroy or obstruct a place a these species use for breeding, resting, shelter or protection or to disturb these species in such a place;
- Possess or control these species alive or dead, or any part of them, or anything derived from them;
- Sell, offer for sale, advertise for sale or offer to these species, or a part of them or anything derived from them;
- Deliberately disturb or deliberately take or destroy the eggs of these species.

The distribution of Smooth Snakes and Sand Lizards is limited to heathland habitats in Surrey, Dorset, Hampshire and Sussex. The Sand Lizard is also known to occur on sand dune habitats in Merseyside and has recently been introduced to some areas of North Wales.

Licenses can be issued in order to allow activities that would constitute an offence under the legislation. Licenses can be issued for specific purposes including scientific study, photography, conservation management and development.

In England and Wales a development license must be obtained from Natural England or the Welsh Assembly before undertaking any works that will affect Sand Lizards or Smooth Snakes or their habitat. A license is not required to carry out surveys or mitigation for other reptile species.



5.10 Otters

The Eurasian Otter is protected under Regulation 41 of The Conservation of Habitats and Species Regulations 2010 and Section 9 of the Wildlife and Countryside Act 1981 (as amended), being listed in Schedule 5 of the act. Under the legislation it is an offence to:

- Deliberately, capture, injure or kill an Otter;
- Damage, destroy or obstruct their breeding or resting places;
- Disturb otters in their breeding or resting places.

Offences under Section 9 carry a maximum penalty of a fine up to £5000, imprisonment for up to six months, or both, for each animal in respect of which an offence is committed.

There is, however, provision within the legislation to kill, take, disturb or possess otters or to use prohibited methods to kill or take under a licence in certain defined circumstances, if the issue cannot be resolved by any alternative means. Licenses can be granted for a variety of purposes, including development.

5.11 Water Vole

Water Voles and their habitats are afforded protection under Section 9 of the Wildlife & Countryside Act 1981 (as amended). Under the legislation it is an offence to:

- Intentionally kill, injure or take (capture) a water vole;
- Possess or control a live or dead water vole, or any part of a water vole or anything derived from a water vole;
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place which a water vole uses for shelter or protection
- Intentionally or recklessly disturb a water vole while it is occupying a structure or place which it uses for shelter or protection;
- Sell, offer or expose for sale, or have in one's possession or transport for the purpose of sale, any live or dead water voles, or any part of a water vole or anything derived from a water vole;
- Publish any advertisement, or cause any advertisement to be published, which is likely to be understood as conveying that a person buys or sells, or intends to buy or sell, any of the above things.

Offences under Section 9 carry a maximum penalty of a fine up to £5000, imprisonment for up to six months, or both, for each animal in respect of which an offence is committed.

There is no provision under the Wildlife and Countryside Act 1981 for licences to be issued for the purpose of development



5.12 Birds

Section 1 of the Wildlife and Countryside act 1981 makes it an offence to intentionally kill, injure, handle or remove any wild bird (with the exception of some pest species), to take or damage a nest whilst it is in use or being built and to take or destroy eggs.

Species listed in Schedule 1 of the Act (see Table 1), including the Little Ringed Plover, Barn Owl and Kingfisher, are afforded an even higher level of protection. In addition to the offence of taking, damaging or destroying nests or eggs it is also an offence to disturb Schedule 1 species whilst they are building or sitting on nests.

Whilst it is not an offence to disturb non-Schedule 1 species whilst they are building or sitting on a nest an offence may occur if the bird is permanently driven away from its nesting site by prolonged disturbance which leads to the failure of eggs or the death of young.

Surveys for the presence of breeding birds are required if any nesting habitat is to be removed during the breeding season (March to August inclusive).

Invasive Plant Species

- 5.13 Under Section 14 (2) of the Wildlife and Countryside Act (1981) it is illegal to spread the invasive non-native plants Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heracleum mantegazzianum*). At present no requirement exists to eradicate these plants from sites where they are already established
- 5.14 Environment Agency guidance also exists for the aquatic weeds Australian swap stonecrop (*Crassula helmsii*), Floating pennywort (*Hydrocotyle ranunculoides*) and Parrot's feather (*Myriophyllum aquaticum*). Although no legal obligation exists it is considered good practice to avoid spreading these invasive plants when working in infested areas.



6.0 HABITAT SURVEY

Extended Phase One Methods

- 6.1 An extended phase one habitat survey of the site was undertaken by Joe Whittick BSc (Hons.) on the 6th June 2013. Joe Whittick has over nine years experience as an ecological consultant and is a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM).
- 6.2 The survey was undertaken prior to the start of any construction or site preparation works.
- 6.3 The extended phase one habitat survey is a standard method of survey widely used as the basis of ecological assessments (JNCC, 1993). The phase one survey covers the footprint of the proposed development and descriptions of the immediate surrounding area (up to 100 metres). A habitat map is prepared to show the locations and extent of habitats. Detailed descriptions of important plant communities, other valuable ecological components (e.g. protected species potential) and invasive plant species are provided as target notes.
- 6.4 The phase one habitat survey is not intended to provide a comprehensive list of species. Plant species lists have been compiled with the aim of characterising habitats in order to assess their importance for nature conservation.
- 6.5 Incidental observations of birds and mammals were also made during the phase one habitat survey.

Results

- 6.6 The habitat survey is illustrated on Drawing D/JWE/1368/002 (Appendix 1). Target Notes are presented in Appendix 2.
- 6.7 The following habitats were recorded within the survey area and adjacent land:
 - Semi-improved grassland
 - Improved grassland
 - Amenity grassland
 - Broad-leaved semi-natural woodland
 - Scattered broad-leaved trees
 - Dense/continuous scrub
 - Scattered scrub
 - Hedgerows
 - Running water
 - Standing water



6.8 Habitats within the proposed development site and wider survey area:

- Semi-improved grassland

The majority of the survey area comprises areas of semi-improved neutral grassland meadow (see photographs 1 and 2, Appendix 3). Species in these areas include Timothy (*Phleum pratense*), meadow foxtail (*Alopecurus pratensis*), cock's-foot (*Dactylis glomerata*), perennial rye-grass (*Lolium perenne*), ribwort plantain (*Plantago lanceolata*), daisy (*Bellis perennis*), self-heal (*Prunella vulgaris*), creeping buttercup (*Ranunculus repens*) and cuckoo flower (*Cardamine pratensis*).

- Improved grassland

An improved grassland sheep grazed field is located outside of the northern corner of the site. Further improved grassland fields are located outside of the western site boundary on the opposite side of Erlas Lane.

- Amenity grassland

Mown amenity grassland verges are located outside of the south-eastern site boundary adjacent to Abenbury Way and outside of the north-eastern site boundary (see photograph 3, Appendix 3).

- Broad-leaved semi-natural woodland

A band of broad-leaved woodland extends along the north-western site boundary adjacent to Erlas Road and along the southern site boundary (see photographs 4, and 5, Appendix 3). A small area of woodland also extends from the eastern end of the woodland on the southern site boundary out across the eastern side of the site (see photograph 6, Appendix 3). Species in the woodland include ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*), lime (*Tilia spp.*), copper beech (*Fagus sylvatica*), and willow (*Salix spp.*). A mature oak (*Quercus spp.*) tree is located in the woodland area on the north-western site boundary (see photograph 7, Appendix 3) and three mature oaks are located in the area of woodland which extends out across the eastern side of the site.

The woodland area on the southern site boundary is quite boggy in places, particularly to the west.

- Scattered broad-leaved trees

A mature oak tree is located in an area of scrub towards the northern corner of the site (see photograph 8, Appendix 3).

- Dense/continuous scrub

A band of dense blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*), willow (*Salix spp.*) and hawthorn (*Crataegus monogyna*) scrub extends from the southern corner of the survey area north-west across the southern part of the site (see photograph 9, Appendix 3).

A small area of scrub comprising hawthorn (*Crataegus monogyna*) and elder (*Sambucus nigra*) is located in the northern corner of the site (see photograph 10, Appendix 3).

An area of scrub with elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*) and bramble (*Rubus fruticosus agg.*) is located in the southern corner of the survey area.



- Hedgerows
A mature hedgerow connects into the northern site boundary. A further mature hedgerow containing mature oak trees is located outside of the western site boundary on the opposite side of Erilas Lane.
- Running water
A small watercourse runs through the woodland area on the southern site boundary (see photograph 11, Appendix 3). The watercourse is relatively shallow and has poorly vegetated earth banks.
- Standing water
A pond is located outside of the north-western boundary of the site on the opposite side of Erilas Lane. The pond has a number of duck houses and is in relatively poor condition with very turbid water (see photograph 12, Appendix 3) No aquatic plants could be seen.



6.9 Extended Phase One Habitat Survey Overview

- Great crested newts – No ponds are located within the site under survey. Three ponds are shown on OS maps within 250 metres of the site with the closest being located approximately 20 metres outside of the north-western site boundary. Great crested newt records exist for this pond and for another group of ponds located approximately 300 metres west of the survey area.

The semi-improved grassland, scrub and woodland habitats on site have high potential value as foraging and refuge habitat for amphibian species, including great crested newts.

- Bats – No buildings are located within the survey area. All trees on site were assessed for their potential to support roosting bats including:
 - Features suitable as roosting sites (natural holes, woodpecker holes, cracks/splits in major limbs, loose bark, dense ivy, hollows, bird and bat boxes);
 - Signs indicating possible use by bats (scratches around entry points, staining around entry points, bat droppings, smell of bats, smoothing of surfaces around cavity).

Trees were categorised for their potential to support roosting bats using the Bat Conservation Trust (BCT, 2012) survey guidelines (see Appendix 5 for the definition of the categories used).

The majority of the trees on site, including trees within the woodland areas, were classed as Category 3 in terms of their roosting potential. A number of small diameter ivy clad trees are present in the woodland area on the southern site boundary and these trees were classed as Category 2 in terms of their roosting potential.

The mature oak tree in the band of woodland on the north-western site boundary was classed as Category 1 in terms of its roosting potential due to the presence of splits and cavities in the trunk and main limbs. Two mature ash trees in this band of woodland were also classed as Category 2. Three mature oak trees are present in the band of woodland which extends along the eastern side of the site. Of these one was classed as Category 1 and two as Category 2. The mature oak tree in the scrub area to the north of the site was also classed as Category 1 in terms of its roosting potential.

Category 1 and Category 2 trees are marked as C1 and C2 respectively on drawing D/JWE/1368/002 (Appendix 1).

Bats may forage over the site and are likely to commute and forage along the woodland edges to the south and west of the survey area.

- Badgers – No badger setts were identified within the site boundary, however dense scrub and trees restricted the survey in some areas. A mammal path was identified entering the western site boundary in close proximity to the small watercourse. The path extends into the woodland area on the southern site boundary. The path originates from the improved grassland field on the opposite side of Erilas Road before passing under a fence and crossing Erilas Lane. A single badger guard hair was found attached the fence which the badger path passes beneath confirming that it is used by badgers. No other evidence of badger activity (latrines, scrapes etc.) was identified during the survey.



- Reptiles – The scrub and rough grassland habitats on site offer suitable refuge and foraging opportunities for common reptile species including slow worm and grass snake.
- Water Voles – The small watercourse in the woodland area on the southern site boundary has poorly vegetated earth banks and is relatively shallow making it sub-optimum as habitat for water voles. The length of the watercourse where it passes through the site was walked during the phase one survey and no evidence of water voles was identified.
- Otters – No potential otter habitat was identified in close proximity to the survey area.
- Birds – Birds are likely to nest in the trees and scrub on and adjacent to the site. Ground nesting birds could also potentially use the site.
- Invasive Species – No invasive plant species were identified on site during the phase one survey. Dense scrub and trees did however restrict the survey in some areas.
- Dingy and Grizzled Skipper – The land that will be impacted by the proposals is not thought to have high value for Dingy and Grizzled Skipper due to the lack of preferred food plants for these species, eg. birdsfoot trefoil.

6.10 Other Observations

Rabbits and foxes are active on site and a number of active burrows were noted at the time of survey.



7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Protected Sites

No statutorily designated nature conservation sites are located within 1 kilometre of the survey area.

Two locally designated Wildlife Sites are located within 1 kilometre of the survey area. Given their distance from the site, no direct impacts on these areas are predicted. The woodland and other semi-natural habitats on site, particularly along the southern site boundary, have a significant wildlife corridor function and there is a risk of indirect impacts on the Wildlife Sites due to fragmentation of habitats and a general loss of connectivity across the industrial estate. This is dealt with in more detail in section 7.2 below.

7.2 Habitats

No statutorily protected habitats are present on site and all plant species identified within the survey area are considered to be common at local and regional levels. Rivers and streams, such as that on the southern site boundary, and woodland are however both Wrexham Biodiversity Action Plan (BAP) habitats.

Any proposals for the site should aim to protect, and where possible enhance, existing biodiversity interest in line with *Wrexham Planning Guidance Note 29 – Employment Development and Nature Conservation*. This should be achieved primarily by retaining and protecting the higher quality areas of habitat on site and by enhancing other areas in order to compensate for the land lost to development. Off-site compensation may be considered but only as a last resort and where it can be shown that there would be significant benefits to this approach (measures would need to be agreed with WCBC and Natural Resources Wales).

The woodland areas on site, particularly the band of woodland and the associated watercourse on the southern site boundary, have significant ecological value as both habitats for wildlife and as wildlife corridors. The woodland on the southern boundary particularly acts as a link from the wider countryside to the west of the site through into the industrial estate and its importance has been specifically highlighted in Planning Guidance Note 29. The woodland has been confirmed as a corridor for badgers and will also be used by other species. The woodland and scrub areas on site, particularly those to the south, should wherever possible be retained as part of any proposals and should also be protected during any site works using temporary fencing. New native tree and shrub planting, particularly at the site boundaries and fronting roads, would also serve to improve the wildlife corridor function of the site.

The proposals for the site will ultimately lead to the loss of areas of semi-improved neutral grassland. The grassland habitats on site have value for invertebrates and also as terrestrial habitat for amphibians. Areas of this habitat should be retained with the most obvious area for retention being the grassland between the woodland area and band of scrub to the south of the site. This grassland area could be enhanced for amphibians through the addition of new refuge and hibernation mounds and for invertebrates through the addition of insect boxes. New landscaping as part of the proposals should also aim to avoid formal mown grassland areas and should instead try to create species rich seeded wild-flower verges or wildflower turf areas which will have significant value for invertebrate species.



The site could be further enhanced for wildlife, particularly amphibians through the creation of a new pond. The pond located outside of the north-western site boundary, where great crested newts have previously been recorded, was found to be in poor condition at the time of survey and the creation of a new pond within the site boundary would therefore have significant biodiversity benefits. The pond would ideally be located in areas of retained semi-improved grassland, potentially in the south-western corner of the site.

A management plan for the site will need to be produced detailing the management of all retained and enhanced habitats. Management works would include measures such as removing non-native species from woodland areas, retaining dead wood within woodlands and mowing grassland areas once a year in autumn after flowers have seeded in order to create and maintain a diverse grassland sward. In the majority of cases, long-term management of retained and enhanced habitats should be passed to an appropriate nature conservation organisation.

7.3 Great Crested Newts

A pond located 20 metres north-west of the site has records of great crested newts. The terrestrial habitats within the survey area also have suitability for great crested newts. Given the proximity of the known great crested newt pond, and the suitability of the terrestrial habitats within the site for this species, the presence of great crested newts should be assumed. There is considered to be a risk that great crested newts could be killed or injured as a result of the proposed construction works on site and areas of good quality terrestrial habitat for this species will be lost.

In order to mitigate for these potential impacts it is thought to be necessary to erect a temporary amphibian fence around the proposed construction area and to undertake a trapping scheme within the fenceline to ensure that no great crested newts are present when development works begin. Trapping works can only be undertaken between March and October when newts are active. These works would need to be undertaken under an appropriate Habitats Regulations license issued by the Welsh Assembly. Up to date amphibian survey information (less than 3 years old) for all ponds within a minimum of 250 metres of the site will be required in order to support a license application. Great crested newt surveys can only be undertaken between March and early June with at least three of the required six survey visits being undertaken between mid-April and mid-May.

There will be a loss of grassland habitat as a result of the proposals and this will reduce the available foraging area for great crested newts. This should be compensated for through the enhancement of retained areas of semi-improved grassland through the addition of hibernation/refuge sites and potentially the creation of a new pond (see section 7.2). The design of the site itself should also take into account the presence of great crested newts. Kerb stones and gully pots, which can trap amphibians, should be avoided where possible in favour of SuDS. If the use of SuDS is not possible then ACO kerb stones or similar should be used adjacent to gully pots in order to minimise the risk to amphibians.



7.4 Bats

A number of the mature trees on site and within the woodland areas were assessed as having potential to support roosting bats and were classed as Category 1 and Category 2 in terms of their roosting potential (BCT, 2012). These trees should wherever possible be retained. Where works to trees with bat roosting potential are unavoidable the following approach should be adopted:

- **Category 1 trees** – Further dusk/dawn bat activity surveys should be undertaken in order to confirm the presence/absence of bats (these surveys can be undertaken from May to early September only). If bats are found a license will be required for any works to the tree. If no bats are found roosting then the tree should be treated as Category 2.
- **Category 2 trees** – Works to these trees should be undertaken using Reasonable Avoidance Measures (RAMs) for bats. These measures should include raised inspections prior to the tree works and soft felling where necessary. All works should cease and appropriate advice should be sought if any bats are found.

The woodland and scrub areas on site have good potential value as foraging habitat and commuting routes for bat species and should be retained and protected as described in section 7.2. If significant tree or scrub removal is to take place then additional bat activity surveys of the site should be undertaken between May and August in order to identify any significant bat commuting routes and foraging areas and to ensure that these are adequately mitigated for.

New external lighting as part of the proposals has significant potential to disrupt bat commuting and foraging activity, particularly for *Myotis* species which are known to be present on the estate. Measures should be implemented on site to minimise the potential impacts of the development on foraging and commuting activity. Potential measures to reduce impacts on bats include:

- Do not "over" light. This is a major cause of obtrusive light and is a waste of energy. Use only the minimum amount of light needed for safety. There are published standards for most lighting tasks, adherence to which will help minimise upward reflected light.
- Eliminate any bare bulbs and any light pointing upwards. The spread of light should be kept near to or below the horizontal.
- Use narrow spectrum bulbs to lower the range of species affected by lighting.
- Use light sources that emit minimal ultra-violet light. Insects are attracted to light sources that emit ultra-violet radiation.
- Reduce light-spill so that light reaches only areas needing illumination. Shielding or cutting light can be achieved through the design of the luminaire or with accessories, such as hoods, cowls, louvers and shields to direct the light. Lighting should be directed towards the centre of the site and away from adjacent woodland edges where bats are likely to forage.
- Reduce the height of lighting columns. Light at a low level reduces ecological impact.
- For pedestrian lighting, use low level lighting that is directional as possible and below 3 lux at ground level.
- Use embedded road lights to illuminate the roadway and light only high-risk stretches of roads, such as crossings and merges, allowing headlights to take up the slack at other times.
- Limit the times that lights are on to provide some dark periods for wildlife.

(Bat Conservation Trust, 2011)



In order to enhance the site for bats it would be desirable to provide a number of new bat boxes on the retained trees within the woodland areas. Positioning of these boxes should be agreed with an appropriately experienced bat ecologist.

7.5 Badgers

No badger setts were identified on site however dense scrub and trees restricted the survey in some areas. Evidence of badger activity was identified in the form of a badger path entering the western side of the site and passing through the woodland area on the southern site boundary. The woodland area is acting as a corridor for badgers and this feature of the site should be retained and protected as described in section 7.2.

Badgers can form new setts at any time therefore a repeat survey of the site for active badger setts should be undertaken immediately prior to the proposed start on site. Any clearance of dense vegetation from the site should then be undertaken with care and where appropriate under the supervision of an experienced badger ecologist. If any large mammal holes are identified during clearance works then works should cease and specialist advice should be sought.

Badgers may cross the proposed working areas and may forage within the site boundary therefore general site precautions for this species should be implemented during any construction works. These precautions should include limiting the movement of machinery to daylight hours in order to avoid harming badgers and covering deep excavations at night and capping any exposing pipework in order to prevent badgers becoming traps. Alternatively, the full development area should be securely badger fenced in order to restrict access for badgers throughout the construction period.

7.6 Reptiles

The semi-improved grassland and scrub habitats on site have suitability as foraging and refuge sites for common reptile species. Slow Worm and grass snake have also been recorded within 1 kilometre of the survey area. Further reptile surveys of the site would be required in order to confirm the presence/absence of these species within the proposed development area. The optimum months for reptile surveys are April/May and September.

The measures employed in order to exclude amphibians from the site (see section 7.3) should also be sufficient to exclude reptiles during any development works. Artificial reptile refuges should be used in addition to pitfall traps during the trapping of the site. The habitat creation/enhancement proposed for great crested newts should also serve to provide new/enhanced habitat for common reptile species.

7.7 Water Voles

The watercourse which passes through the woodland on the southern site boundary was found to be sub-optimum as habitat for water voles and no evidence of this species was identified at the time of survey. However, as a precaution a detailed water vole survey of the watercourse should be undertaken if any works are to come within 8 metres of the top of the bank of the watercourse. Water vole surveys can only be undertaken between March and October.



7.8 Otters

No potential otter habitat was identified in close proximity to the survey area. No otter issues are thought to exist for the proposals.

7.9 Birds

Birds are likely to nest in the trees and scrub on and adjacent to the site. Ground nesting birds could also use the site. Existing areas of trees and scrub should wherever possible be retained as part of any proposals for the site. Where removals are unavoidable, where possible clearance of potential nesting habitat should be undertaken outside of the nesting season (the nesting season runs from March to August inclusive). If works are to take place during the nesting season the site should be checked for nesting birds by an experienced surveyor immediately prior to the start of works. If breeding birds are found during the survey the nest should not be disturbed and works in the area of the nest should be delayed until nesting is complete and young birds have fledged (as confirmed by a suitably qualified ecologist).

Any new planting schemes should include a variety of native tree and shrub species which will have value to bird species both as nesting sites and a food source. A number of new bird nesting boxes should also be provided on retained trees in order to compensate for the loss of nesting sites as a result of the proposals.

7.10 Invasive Species

No invasive plant species were identified on site during the phase one survey, however dense scrub and trees restricted the survey in some parts of the site. Any clearance of dense vegetation from the site should be undertaken with care and with invasive plant species in mind. If any invasive species are identified then works should cease and specialist advice should be sought.

7.11 Dingy and Grizzled Skipper

The land that will be impacted by the proposals is not thought to have high value for Dingy and Grizzled Skipper due to the lack of preferred food plants for these species, eg. birdsfoot trefoil. The semi-improved neutral grassland habitats on site will however have value to other invertebrate species and areas of this habitat should be retained and enhanced as described in section 7.2.

THESE SURVEY RESULTS ARE VALID FOR UP TO 1 YEAR AFTER WHICH RE-SURVEYS ARE RECOMMENDED



8.0 REFERENCES

Wrexham Biodiversity Action Plan (BAP)

WCBC Local Planning Guidance Note No. 29 – *Wrexham Industrial Estate – Employment, Development and Nature Conservation*

NATURE CONSERVANCY COUNCIL (1990) Handbook for Phase 1 habitat survey. NCC. Peterborough.

STACE, C. A. (1997) *Flora of the British Isles*, 2nd edition. Cambridge University Press

ENGLISH NATURE (2001) *Great crested newt mitigation guidelines*. English Nature, Peterborough.

Mitchell-Jones, A.J, & McLeish, A.P. Ed. 2004. *Bat Workers Manual*

ENGLISH NATURE 2004. *Bat Mitigation Guidelines*.

BAT CONSERVATION TRUST. 2007. *Bat Surveys – Good Practice Guidelines*



APPENDIX 1

Drawings:

Site Location Plan - D/JWE/1368/001

Extended Phase One Habitat Plan - D/JWE/1368/002





= Site Location



J W ECOLOGICAL LTD

TITLE: Site Location Plan

SITE: Plot C4, Abenbury Way

NGR: SH 37374 50548

DRAWING NUMBER: D/JWE/1368/001



Site: Plot C4, Abenbury Way

Title: Extended Phase One Habitat Plan

KEY:

SI	Semi-improved grassland
I	Improved grassland
A	Amenity grassland
	Broad-leaved semi-natural woodland
	Scattered broad-leaved tress
	Dense/continuous scrub
	Scattered scrub
	Standing water
	Buildings
	Bare ground

	Hedgerow		Fence
	Hedgerow with mature trees		Running water

Target Notes (See Appendix 2)

Bat Survey of Trees:

- C1** Tree classed as Category 1 in terms of its roosting potential
- C2** Tree classed as Category 2 in terms of its roosting potential

GRID REFERENCE:	SCALE:
SJ 37374 50548	1:1000

DRAWN BY:	CHECKED BY:	DATE:
JW	JM	08/06/13

DRAWING NUMBER:	ISSUE:
D/JWE/1368/002	A

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APPENDIX 2

Target Notes



The target notes listed below relate to drawing number D/JWE/1368/002 (Appendix 1):

Target Note 1 (T1)

Areas of semi-improved neutral grassland meadow. Species in these areas include Timothy (*Phleum pratense*), meadow foxtail (*Alopecurus pratensis*), cock's-foot (*Dactylis glomerata*), perennial rye-grass (*Lolium perenne*), ribwort plantain (*Plantago lanceolata*), daisy (*Bellis perennis*), self-heal (*Prunella vulgaris*), creeping buttercup (*Ranunculus repens*) and cuckoo flower (*Cardamine pratensis*).

Target Note 2 (T2)

Improved grassland sheep grazed field located outside of the northern corner of the site.

Target Note 3 (T3)

Mown amenity grassland verge located outside of the south-eastern site boundary adjacent to Abenbury Way.

Target Note 4 (T4)

Band of broad-leaved woodland extending along the north-western site boundary adjacent to Erlas Road and along the southern site boundary. Species in the woodland include ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*), lime (*Tilia spp.*), copper beech (*Fagus sylvatica*), and willow (*Salix spp.*). A mature oak (*Quercus spp.*) tree is located in the woodland area on the north-western site boundary.

Target Note 5 (T5)

Small area of woodland extending from the eastern end of the woodland on the southern site boundary out across the eastern side of the site. Three mature oak (*Quercus spp.*) trees are located in this area of woodland.

Target Note 6 (T6)

Mature oak (*Quercus spp.*) tree located in a small area of hawthorn (*Crataegus monogyna*) and elder (*Sambucus nigra*) scrub in the northern corner of the site.

Target Note 7 (T7)

Band of dense blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*), willow (*Salix spp.*) and hawthorn (*Crataegus monogyna*) scrub extending from the southern corner of the survey area north-west across the southern part of the site.

Target Note 8 (T8)

Area of scrub with elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*) and bramble (*Rubus fruticosus agg.*) located in the southern corner of the survey area.

Target Note 9 (T9)

Small watercourse running through the woodland area on the southern site boundary. The watercourse is relatively shallow and has poorly vegetated earth banks.

Target Note 10 (T10)

Pond located outside of the north-western boundary of the site on the opposite side of Erlas Lane. The pond has a number of duck houses and is in relatively poor condition with very turbid water. No aquatic plants could be seen in the pond.



Target Note 11 (T11)

Badger path entering the western side of the site.

Target Note 12 (T12)

Badger guard hair on fence.



APPENDIX 3

Photographs





Photograph 1 – Semi-improved grassland (view north)



Photograph 2 – Semi-improved grassland (view south)



Photograph 3 – Amenity grassland verge adjacent to Abenbury Way



Photograph 4 – Woodland on the southern site boundary

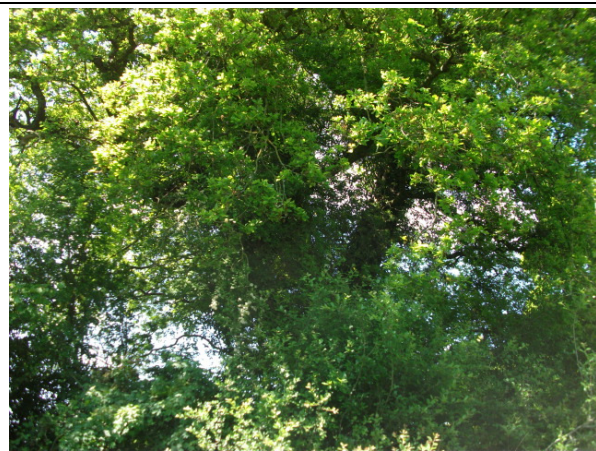




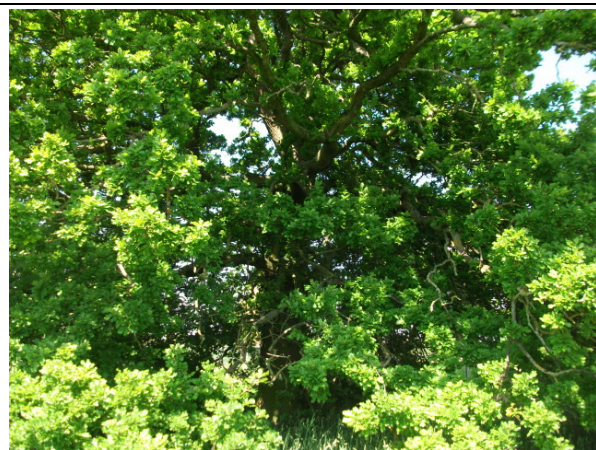
Photograph 5 – Woodland on the north-western site boundary adjacent to Erlas Lane



Photograph 6 – Band of woodland on the eastern side of the site



Photograph 7 – Mature Oak tree in the woodland area on the north-western site boundary



Photograph 8 – Mature Oak tree in the scrub area to the north of the site





Photograph 9 – Dense scrub area extending across the southern part of the site



Photograph 10 – Dense scrub area in the northern corner of the site



Photograph 11 – Small watercourse in the woodland area on the southern site boundary



Photograph 12 – Pond located outside of the north-western site boundary



APPENDIX 4

Desktop Study Response





Please read **Important Issues** and **Notes** before interpreting the following information.

Our Ref.	Client Name	Date Run	Your Ref.
E03359	J W Ecological Ltd	11/06/2013	1368

Site Name	Grid Reference
Abenbury Way	SJ3737450548

Category 1 Species (Species with European and/or UK Legal Protection, Section 42 [NERC] Species or UK BAP Priority Species) within 1000m - 174 records										
Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
Triturus cristatus (Great Crested Newt/Madfall Ddwr Gribog)	SJ373506 (Estimated from Map)	14/04/2000	Anon	2		near Erlas Hall		D1125/001/03 (1857546)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Myotis mystacinus (Whiskered Bat/Ystlum Barfog)	SJ3750 (Estimated from Map)	30/09/1999	Anon	1		Site Name Withheld		D1049/001/02 (683473)	Bern, Bonn, EPS, HDir, WCA5, LBAP[DEN, FLI, GWY]	3
Chiroptera (Bat Species/Ystlum)	SJ3750 (Estimated from Map)	2003	Anon	1		Site Name Withheld		D1049/001/02 (683085)	WCA5	3
Triturus cristatus (Great Crested Newt/Madfall Ddwr Gribog)	SJ37465087	Before 29/08/2003	EAC	Eggs (2001)		Erlas Hall		D1125/001/03 (1857825)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus (Great Crested Newt/Madfall Ddwr Gribog)	SJ370507 (Estimated from Map)	09/03/2000	EAC	2M, 21F (200)		Redwither Wood		D1125/001/03 (1857448)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Chiasmia clathrata (Latticed Heath/Seffyr Delltog)	SJ376502	25/05/2004	Rob W Whitehead	1 Adult	Daytime observation	Wrexham Ind Estate - Ash Road South	Substrate:Unknown.	D1285/001/01 (3067924)	S42, UKBAP, LBAP[GWY]	3
Coenonympha pamphilus (Small Heath/Gweirlöyn Bach y Waun)	SJ376502	25/05/2004	Rob W Whitehead	2	Field record / observation	Wrexham Ind Estate - Ash Road South	Substrate:Unknown.	D1373/001/02 (3101078)	S42, UKBAP, LBAP[GWY]	3
Triturus cristatus (Great Crested Newt/Madfall Ddwr Gribog)	SJ368503 (Estimated from Map)	28/04/2000	Anon	8		Big Wood		D1125/001/03 (1857731)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus (Great Crested Newt/Madfall Ddwr Gribog)	SJ368502 (Estimated from Map)	28/04/2000	EAC	8		Big Wood		D1125/001/03 (1857730)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Coenonympha pamphilus (Small Heath/Gweirlöyn Bach y Waun)	SJ380502	2 records, on 22/05/2004 and 25/05/2004	Rob W Whitehead	2, 2	Field record / observation	Wrexham Ind Estate - Norish FP Ltd	Substrate:Unknown	D1373/001/02	S42, UKBAP, LBAP[GWY]	3
Erynnis tages (Dingy Skipper/Gwibiwr Llwyd)	SJ380502	2 records, on 22/05/2004 and 25/05/2004	Rob W Whitehead	4, 4	Field record / observation	Wrexham Ind Estate - Norish FP Ltd	Substrate:Unknown	D1373/001/02	S42, UKBAP, LBAP[CON, FLI, GWY]	3
Pyrgus malvae (Grizzled Skipper/Gwibiwr Brith)	SJ380502	2 records, on 22/05/2004 and 25/05/2004	Rob W Whitehead	1, 2	Field record / observation	Wrexham Ind Estate - Norish FP Ltd	Substrate:Unknown	D1373/001/02	S42, UKBAP, LBAP[DEN, FLI]	3
Pyrgus malvae (Grizzled Skipper/Gwibiwr Brith)	SJ3737249791	11/05/2011	Clare Williams	2 Adult		Wrexham Industrial Estate: Clywedog Road North	Species survey.	D1466/001/01 (3667432)	S42, UKBAP, LBAP[DEN, FLI]	3
Pyrgus malvae (Grizzled Skipper/Gwibiwr Brith)	SJ3746449796	24/05/2012	George Tordoff	1 Adult		Wrexham Industrial Estate: Coed Aben Road	Species survey.	D1466/001/01 (3667434)	S42, UKBAP, LBAP[DEN, FLI]	3
Triturus cristatus (Great Crested Newt/Madfall Ddwr Gribog)	SJ379500 (Estimated Centroid of Site Name))	May 2004	Raymond Gemmell	+ Adult; + Juvenile; + Egg		Wrexham Industrial Estate	Bottle trap, torch survey and egg search.	D1310/001/01 (2701533)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	1
Pyrgus malvae (Grizzled Skipper/Gwibiwr Brith)	SJ3739149779	11/05/2011	Clare Williams	1 Adult		Wrexham Industrial Estate: Clywedog Road North	Species survey.	D1466/001/01 (3667431)	S42, UKBAP, LBAP[DEN, FLI]	3
Pyrgus malvae (Grizzled Skipper/Gwibiwr Brith)	SJ3740349733	24/05/2012	George Tordoff	10 Adult		Wrexham Industrial Estate: Clywedog Road North	Timed Count.	D1466/001/01 (3667436)	S42, UKBAP, LBAP[DEN, FLI]	3
Triturus cristatus (Great Crested Newt/Madfall Ddwr Gribog)	SJ378498 (Estimated from Map)	22/04/1998	Dylan Lloyd	6		Wrexham Industrial Estate - Woodland Corridor Pond		D1125/001/03 (1857673)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus (Great Crested Newt/Madfall Ddwr Gribog)	SJ379498 (Estimated from Map)	22/04/1998	Dylan Lloyd	7		Wrexham Industrial Estate - Typha pond		D1125/001/03 (1857672)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Myotis mystacinus (Whiskered Bat/Ystlum Barfog)	SJ3749 (Estimated from Map)	30/04/1998	Anon	1		Site Name Withheld		D1049/001/02 (683474)	Bern, Bonn, EPS, HDir, WCA5, LBAP[DEN, FLI, GWY]	3

Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
<i>Triturus cristatus</i> (Great Crested Newt/Madfall Ddwr Gribog)	SJ36984954	08/07/1992	Anon - Herpetofauna Consultants International			Pear Tree Cottage	Report identifies this as a probable record, supplied by local person.	D1125/001/03 (1857447)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
<i>Triturus cristatus</i> (Great Crested Newt/Madfall Ddwr Gribog)	SJ3632651051	Before 29/08/2003	EAC	Eggs (2001)		Bryn Estyn		D1125/001/03 (1857952)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
<i>Triturus cristatus</i> (Great Crested Newt/Madfall Ddwr Gribog)	SJ381496 (Estimated from Map)	15/04/1998	Dylan Lloyd	1		Wrexham Industrial Estate - Field Corner Pond		D1125/001/03 (1857566)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
<i>Triturus cristatus</i> (Great Crested Newt/Madfall Ddwr Gribog)	SJ385500	14 records, between 26/04/2007 and 22/05/2007	Tom Knight			Oth:sa:140:2006		D1317/001/01	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
<i>Triturus cristatus</i> (Great Crested Newt/Madfall Ddwr Gribog)	SJ3839651317	02/07/2002	Wrexham/JG&AH			Cornish Hall, Holt, Pond No. 8, 2002		D1125/001/03 (1857306)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
<i>Triturus cristatus</i> (Great Crested Newt/Madfall Ddwr Gribog)	SJ3620351072	2001	EAC	2M & 2F		Bryn Estyn		D1125/001/03 (1857259)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Lutra lutra (Otter/Dyfrgi)	SJ3751	2 records, both on 06/01/2011	Cardiff University & Environment Agency	Female, Not recorded Not recorded	Dead on road	Site Name Withheld	Comments Withheld	D0120/001/01	Bern, CITES, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, GWY, SNP, WRE]	3
<i>Triturus cristatus</i> (Great Crested Newt/Madfall Ddwr Gribog)	SJ38735091	18/06/1993	Anon - Herpetofauna Consultants International	P		near Wrexham Industrial Estate		D1125/001/03 (1857643)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
<i>Triturus cristatus</i> (Great Crested Newt/Madfall Ddwr Gribog)	SJ38545141	15/06/1993	Anon - Herpetofauna Consultants International	P		near Honeysuckle Cottage		D1125/001/03 (1857581)	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
<i>Vipera berus</i> (Adder/Gwiber)	SJ380490	Before 2009	Anon.			Redwither Brook		D0035/002/01 (2502299)	S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, GWY, SNP]	4
<i>Meles meles</i> (Badger/Mochyn Daear)	SJ3650	3 records, between 01/03/2001 and 19/12/2003	Clwyd Badger Group (CBG)		Badger Sett		CBG Ref: A54.0. Please contact CBG for more details.; CBG Ref: A23.0; CBG Ref: A32.0.	D0059/001/01	BA, LBAP[CON, DEN, FLI, WRE]	3
<i>Meles meles</i> (Badger/Mochyn Daear)	SJ3751	2 records, both on 19/12/2003	Clwyd Badger Group (CBG)		Badger Sett		CBG Ref: A53.1. Please contact CBG for more details.; CBG Ref: A58.0.	D0059/001/01	BA, LBAP[CON, DEN, FLI, WRE]	3
<i>Meles meles</i> (Badger/Mochyn Daear)	SJ3749	19/08/2003	Clwyd Badger Group (CBG)		Badger Sett		CBG Ref: B51.0. Please contact CBG for more details.	D0059/001/01 (804446)	BA, LBAP[CON, DEN, FLI, WRE]	3
<i>Scotopteryx chenopodiata</i> (Shaded Broad-bar/Rhesen Lydan Dywyll)	SJ3749	2 records, on 07/09/2009 and 09/07/2010	Graham, A.N. & J.E.; Justin Williams	2 Adult	Netted	Wrexham Industrial Estate	Substrate:Unknown	D1285/001/01	S42, UKBAP, LBAP[GWY]	3
<i>Falco tinnunculus</i> (Kestrel/Cudyll Coch)	SJ3850	15/06/2008	Norman Hallas	1		Wrexham, Industrial Estate	H Activity.	D1297/002/01 (3408426)	Bern, Bonn, CITES, S42, WBR[RSPB], LBAP[ANG, CON, DEN, FLI, GWY]	1
<i>Muscicapa striata</i> (Spotted Flycatcher/Gwybedog Mannog)	SJ3850	15/06/2008	Norman Hallas	1		Wrexham, Industrial Estate	S Activity.	D1297/002/01 (3417287)	Bern, Bonn, S42, UKBAP, WBR[RSPB], LBAP[CON, DEN, FLI, GWY]	1
<i>Cuculus canorus</i> (Cuckoo/Cog)	SJ3651	2 records, on 02/06/2007 and 17/06/2007	Colin Jones	1, 2		Wrexham, Clwyd House		D1297/002/01	S42, UKBAP, WBR[RSPB], LBAP[CON, DEN, FLI, GWY]	1
<i>Falco tinnunculus</i> (Kestrel/Cudyll Coch)	SJ3651	9 records, between 24/02/2007 and 01/03/2008	Colin Jones	1, 1, 1, 1, 1, 1, 1, 1		Wrexham, Clwyd House		D1297/002/01	Bern, Bonn, CITES, S42, WBR[RSPB], LBAP[ANG, CON, DEN, FLI, GWY]	1
<i>Meles meles</i> (Badger/Mochyn Daear)	SJ3651	3 records, between 01/03/2000 and 01/01/2003	Clwyd Badger Group (CBG)		Badger Sett		CBG Ref: A63.0. Please contact CBG for more details.; CBG Ref: A86.0; CBG Ref: A49.0.	D0059/001/01	BA, LBAP[CON, DEN, FLI, WRE]	3
<i>Passer domesticus</i> (House Sparrow/Aderyn y To)	SJ3651	30/11/2008	Colin Jones			Wrexham, Clwyd House		D1297/002/01 (3414987)	S42, UKBAP, WBAm[RSPB], LBAP[CON, FLI, GWY]	1
<i>Vanellus vanellus</i> (Northern Lapwing/Cornchwiglen)	SJ3651	3 records, between 02/06/2007 and 03/01/2009	Colin Jones	1, 1, 1		Wrexham, Clwyd House		D1297/002/01	BDir, Bonn, S42, UKBAP, WBR[RSPB], LBAP[ANG, CON, DEN, FLI, GWY, SNP]	1
<i>Emberiza schoeniclus</i> (Reed Bunting/Bras y Cyrs)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3416844)	Bern, S42, UKBAP, WBAm[RSPB], LBAP[CON, DEN, FLI, GWY]	1
<i>Meles meles</i> (Badger/Mochyn Daear)	SJ3649	19/12/2003	Clwyd Badger Group (CBG)		Badger Sett		CBG Ref: B38.0. Please contact CBG for more details.	D0059/001/01 (804430)	BA, LBAP[CON, DEN, FLI, WRE]	3
<i>Passer domesticus</i> (House Sparrow/Aderyn y To)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3415035)	S42, UKBAP, WBAm[RSPB], LBAP[CON, FLI, GWY]	1

Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
<i>Vanellus vanellus</i> (Northern Lapwing/Cornchwiglen)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3416297)	BDir, Bonn, S42, UKBAP, WBR[RSPB], LBAP[ANG, CON, DEN, FLI, GWY, SNP]	1
<i>Anguis fragilis</i> (Slow-worm/Neidr Ddefaid)	SJ3849	1999	Anon			Wrexham Industrial Estate		D1076/001/01 (450915)	S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, GWY, SNP]	3
<i>Anguis fragilis</i> (Slow-worm/Neidr Ddefaid)	SJ3849	1999	Young Assoc.			Wrexham Industrial Estate	Habitat: Scrub, grassl'd.	D0035/002/01 (2502260)	S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, GWY, SNP]	4
<i>Coenonympha pamphilus</i> (Small Heath/Gweirlöyn Bach y Waun)	SJ3849 (Selected from Interactive Map)	19 records, between 01/06/2007 and 12/05/2009	John V Smith	: 1 to 3		Calypso WIE	Section 1.; Section 3.; Section 5.; Section 6.; Section 8.; Section 2.; Section 4.; Section 7.; Section 9.	D1470/001/01	S42, UKBAP, LBAP[GWY]	4
<i>Cuculus canorus</i> (Cuckoo/Cog)	SJ3849 (Selected from Interactive Map)	14/05/2007	John V Smith	1		Calypso WIE	Heard.	D1470/001/01 (3698488)	S42, UKBAP, WBR[RSPB], LBAP[CON, DEN, FLI, GWY]	4
<i>Erynnis tages</i> (Dingy Skipper/Gwibiwr Llwyd)	SJ3849 (Selected from Interactive Map)	23 records, between 03/05/2009 and 14/06/2009	John V Smith	: 1 to 9		Calypso WIE	Section 3.; Section 8.; Section 1.; Section 6.; Section 9.; Section 2.; Section 7.; Section 4.; Section 5.	D1470/001/01	S42, UKBAP, LBAP[CON, FLI, GWY]	4
<i>Erynnis tages</i> (Dingy Skipper/Gwibiwr Llwyd)	SJ3849	2 records, on 12/05/2000 and 15/05/2000	Anon.			The Oaks		D1050/003/01	S42, UKBAP, LBAP[CON, FLI, GWY]	1
<i>Falco tinnunculus</i> (Kestrel/Cudyll Coch)	SJ3849	2 records, on 16/04/2008 and 17/03/2009	Norman Hallas	1, 1		Wrexham, Industrial Estate, W		D1297/002/01	Bern, Bonn, CITES, S42, WBR[RSPB], LBAP[ANG, CON, DEN, FLI, GWY]	1
<i>Meles meles</i> (Badger/Mochyn Daear)	SJ3849	3 records, all on 02/01/2003	Clwyd Badger Group (CBG)		Badger Sett		CBG Ref: B56.0. Please contact CBG for more details.; CBG Ref: B89.0; CBG Ref: B20.0.	D0059/001/01	BA, LBAP[CON, DEN, FLI, WRE]	3
<i>Pyrgus malvae</i> (Grizzled Skipper/Gwibiwr Brith)	SJ3849 (Selected from Interactive Map)	35 records, between 03/05/2009 and 14/06/2009	John V Smith	: 1 to 4		Calypso WIE	Section 3.; Section 8.; Section 2.; Section 1.; Section 4.; Section 6.; Section 7.; Section 9.; Section 5.	D1470/001/01	S42, UKBAP, LBAP[DEN, FLI]	4
<i>Pyrgus malvae</i> (Grizzled Skipper/Gwibiwr Brith)	SJ3849	2 records, on 12/05/2000 and 15/05/2000	Anon.	3 adult, 11 adult		The Oaks		D1050/003/01	S42, UKBAP, LBAP[DEN, FLI]	1
<i>Vipera berus</i> (Adder/Gwiber)	SJ3849	1999	Anon			Wrexham Industrial Estate		D1076/001/01 (451117)	S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, GWY, SNP]	3
<i>Vipera berus</i> (Adder/Gwiber)	SJ3849	1999	Young Assoc.			Wrexham Industrial Estate	Habitat: Scrub, grassl'd.	D0035/002/01 (2502297)	S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, GWY, SNP]	4

Category 2 Species (Global Red List, British Red Data Book, Nationally Rare & Scarce, Welsh Red and Amber Birds & Welsh Vascular Plant Red Data List, where these are not identified in Category 1) within 1000m - 36 records										
Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
<i>Crepis biennis</i> (Rough Hawk's-beard/Gwalchlys Garw)	SJ3749	11/06/2011	Anon - BSBI			Wrexham Industrial Estate		D1169/002/01 (3682451)	WVP, LBAP[CON]	3
<i>Hirundo rustica</i> (Swallow/Gwennol)	SJ3850	15/06/2008	Norman Hallas	2		Wrexham, Industrial Estate	H Activity.	D1297/002/01 (3404518)	Bern, WBAm[RSPB], LBAP[ANG, CON, GWY]	1
<i>Aegithalos caudatus</i> (Long-tailed Tit/Titw Cynffon-Hir)	SJ3651	5 records, between 29/04/2007 and 04/01/2009	Colin Jones	1, 1, 3, 3		Wrexham, Clwyd House		D1297/002/01	WBAm[RSPB]	1
<i>Apus apus</i> (Common Swift/Gwennol Ddu)	SJ3651	4 records, between 05/05/2007 and 09/06/2007	Colin Jones	2, 2, 4		Wrexham, Clwyd House		D1297/002/01	WBAm[RSPB]	1
<i>Hirundo rustica</i> (Swallow/Gwennol)	SJ3651	5 records, between 05/05/2007 and 17/06/2007	Colin Jones	8, 8		Wrexham, Clwyd House		D1297/002/01	Bern, WBAm[RSPB], LBAP[ANG, CON, GWY]	1
<i>Periparus ater</i> (Coal Tit/Titw Penddu)	SJ3651	30/11/2008	Colin Jones			Wrexham, Clwyd House		D1297/002/01 (3406799)	Bern, WBAm[RSPB], LBAP[CON]	1
<i>Sturnus vulgaris</i> (Common Starling/Drudwen)	SJ3651	4 records, between 12/04/2007 and 03/01/2009	Colin Jones	2, 2, 2		Wrexham, Clwyd House		D1297/002/01	BDir, WBR[RSPB], LBAP[CON, FLI, GWY]	1
<i>Turdus philomelos</i> (Song Thrush/Bronfraith)	SJ3651	01/03/2008	Colin Jones	2		Wrexham, Clwyd House		D1297/002/01 (3417177)	BDir, WBAm[RSPB], LBAP[ANG, CON, DEN, FLI, GWY, SNP, WRE]	1
<i>Aegithalos caudatus</i> (Long-tailed Tit/Titw Cynffon-Hir)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3415556)	WBAm[RSPB]	1
<i>Anas platyrhynchos</i> (Mallard/Hwyaden Wylt)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3415744)	BDir, Bonn, WBAm[RSPB], LBAP[CON, GWY]	1
<i>Anthus pratensis</i> (Meadow Pipit/Corhedydd y Waun)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3415884)	Bern, WBAm[RSPB], LBAP[CON]	1
<i>Carduelis cannabina</i> (Linnet/Llinos)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3408537)	Bern, WBR[RSPB], LBAP[ANG, CON, DEN, FLI, GWY]	1
<i>Hirundo rustica</i> (Swallow/Gwennol)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3404535)	Bern, WBAm[RSPB], LBAP[ANG, CON, GWY]	1
<i>Larus argentatus</i> (Herring Gull/Gwylan y Penwaig)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3414543)	BDir, WBR[RSPB], LBAP[CON, GWY]	1

Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
<i>Phoenicurus phoenicurus</i> (Common Redstart/Tingoch)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3409075)	Bern, WBAm[RSPB], LBAP[CON, GWY, SNP]	1
<i>Phylloscopus trochilus</i> (Willow Warbler/Telor yr Helyg)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3417639)	WBR[RSPB], LBAP[CON]	1
<i>Turdus philomelos</i> (Song Thrush/Bronfraith)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3417243)	BDir, WBAm[RSPB], LBAP[ANG, CON, DEN, FLI, GWY, SNP, WRE]	1
<i>Acanthiophilus helianthi</i> (An Insect - True Fly (Diptera))	SJ3849	04/07/2000	Mike Howe		Field Observation	The Oaks		D0217/001/01 (1057403)	RD2	3
<i>Diplapion stolidum</i> (An Insect - Beetle (Coleoptera))	SJ3849	04/07/2000	Adrian Fowles	1 Adult	Field Observation	The Oaks		D0217/001/01 (1017798)	RD2	3
<i>Oxyna nebulosa</i> (An Insect - True Fly (Diptera))	SJ3849	04/07/2000	Mike Howe	2 Female; 2 male	Field Observation	The Oaks		D0217/001/01 (1057364)	RD1	3
<i>Pseudorchestes pratensis</i> (An Insect - Beetle (Coleoptera))	SJ3849	04/07/2000	Adrian Fowles	1 Adult	Field Observation	The Oaks		D0217/001/01 (1017789)	RD2	3
<i>Sylvia communis</i> (Common Whitethroat/Llwydfron)	SJ3849 (Selected from Interactive Map)	14/05/2007	John V Smith	1		Calypso WIE		D1470/001/01 (3698487)	WBAm[RSPB], LBAP[CON]	4

Category 3 Species (LBAP Species not identified under Categories 1 & 2, Locally Important species as specified by local experts) within 1000m - 66 records										
Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
<i>Phylloscopus collybita</i> (Common Chiffchaff/Siff-Siaff)	SJ377512	05/10/2010	Rob Smith	1 None	field	Borras		D0969/001/03 (3514464)	LBAP[CON]	1
<i>Melilotus altissimus</i> (Tall Melilot/Yr Wydro Dal)	SJ3749	06/07/2009	Graham, A.N.			Wrexham Industrial Estate		D1169/002/01 (3682527)	LBAP[GWY]	3
<i>Ophrys apifera</i> (Bee Orchid/Tegeirian y Wenynen)	SJ3749	06/07/2009	Graham, A.N.			Wrexham Industrial Estate	3, not together.	D1169/002/01 (3682537)	CITES, LBAP[GWY]	3
<i>Buteo buteo</i> (Buzzard/Bwncath)	SJ3850	15/06/2008	Norman Hallas	1		Wrexham, Industrial Estate	H Activity.	D1297/002/01 (3407802)	Bonn, CITES, LBAP[CON]	1
<i>Carduelis chloris</i> (Greenfinch/Llinos Werdd)	SJ3850	15/06/2008	Norman Hallas	1		Wrexham, Industrial Estate		D1297/002/01 (3412048)	Bern, LBAP[CON]	1
<i>Parus major</i> (Great Tit/Titw Mawr)	SJ3850	15/06/2008	Norman Hallas			Wrexham, Industrial Estate		D1297/002/01 (3413432)	Bern, LBAP[CON]	1
<i>Phylloscopus collybita</i> (Common Chiffchaff/Siff-Siaff)	SJ3850	15/06/2008	Norman Hallas	1		Wrexham, Industrial Estate	S Activity.	D1297/002/01 (3408029)	LBAP[CON]	1
<i>Prunella modularis</i> (Dunnock/Llwyd y Gwrych)	SJ3850	15/06/2008	Norman Hallas	1		Wrexham, Industrial Estate		D1297/002/01 (3414146)	Bern, LBAP[CON]	1
<i>Sylvia atricapilla</i> (Blackcap/Telor Penddu)	SJ3850	15/06/2008	Norman Hallas	1		Wrexham, Industrial Estate		D1297/002/01 (3405387)	LBAP[CON]	1
<i>Accipiter nisus</i> (Sparrowhawk/Gwalch Glas)	SJ3651	2 records, on 07/04/2007 and 30/11/2008	Colin Jones			Wrexham, Clwyd House		D1297/002/01	Bonn, CITES, LBAP[CON]	1
<i>Buteo buteo</i> (Buzzard/Bwncath)	SJ3651	11 records, between 24/02/2007 and 01/03/2008	Colin Jones	1, 1, 2, 2, 2, 2, 1, 1, 1, 3, 2		Wrexham, Clwyd House		D1297/002/01	Bonn, CITES, LBAP[CON]	1
<i>Carduelis carduelis</i> (Goldfinch/Nico)	SJ3651	5 records, between 11/03/2007 and 01/03/2008	Colin Jones	2, 2, 2, 2, 2		Wrexham, Clwyd House		D1297/002/01	Bern, LBAP[ANG, CON]	1
<i>Certhia familiaris</i> (Treecreeper/Dringwr Bach)	SJ3651	4 records, between 11/03/2007 and 07/04/2007	Colin Jones	1, 1, 1, 1		Wrexham, Clwyd House		D1297/002/01	Bern, LBAP[CON]	1
<i>Cyanistes caeruleus</i> (Blue Tit/Titw Tomos Las)	SJ3651	11 records, between 24/02/2007 and 03/01/2009	Colin Jones	2, 2, 4, 4, 5, 5, 6, 6, 2, 2		Wrexham, Clwyd House		D1297/002/01	Bern, LBAP[CON]	1
<i>Dendrocopos major</i> (Great Spotted Woodpecker/Cnocell Fraith Fwyaf)	SJ3651	3 records, between 07/04/2007 and 30/11/2008	Colin Jones	1, 1		Wrexham, Clwyd House		D1297/002/01	Bern, LBAP[CON]	1
<i>Motacilla alba</i> subsp. <i>yarrellii</i> (Pied Wagtail/Siglen Fraith)	SJ3651	3 records, between 02/06/2007 and 17/06/2007	Colin Jones	2, 1, 2		Wrexham, Clwyd House		D1297/002/01	Bern, LBAP[CON]	1
<i>Parus major</i> (Great Tit/Titw Mawr)	SJ3651	2 records, both on 11/03/2007	Colin Jones	1, 1		Wrexham, Clwyd House		D1297/002/01	Bern, LBAP[CON]	1
<i>Buteo buteo</i> (Buzzard/Bwncath)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3407886)	Bonn, CITES, LBAP[CON]	1
<i>Carduelis carduelis</i> (Goldfinch/Nico)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3411860)	Bern, LBAP[ANG, CON]	1
<i>Carduelis chloris</i> (Greenfinch/Llinos Werdd)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3412101)	Bern, LBAP[CON]	1
<i>Certhia familiaris</i> (Treecreeper/Dringwr Bach)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3411537)	Bern, LBAP[CON]	1
<i>Columba oenas</i> (Stock Pigeon/Colomen Wyllt)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3417323)	BDir, LBAP[GWY]	1

Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
<i>Corvus corax</i> (Common Raven/Cigfran)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3408952)	LBAP[CON]	1
<i>Cyanistes caeruleus</i> (Blue Tit/Titw Tomos Las)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3405814)	Bern, LBAP[CON]	1
<i>Dendrocopos major</i> (Great Spotted Woodpecker/Cnocell Fraith Fwyaf)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3413220)	Bern, LBAP[CON]	1
<i>Motacilla alba subsp. yarrellii</i> (Pied Wagtail/Siglen Fraith)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3416580)	Bern, LBAP[CON]	1
<i>Parus major</i> (Great Tit/Titw Mawr)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3413506)	Bern, LBAP[CON]	1
<i>Phylloscopus collybita</i> (Common Chiffchaff/Siff-Siaff)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3408058)	LBAP[CON]	1
<i>Prunella modularis</i> (Dunnock/Llwyd y Gwrych)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm		D1297/002/01 (3414225)	Bern, LBAP[CON]	1
<i>Sylvia atricapilla</i> (Blackcap/Telor Penddu)	SJ3649	17/04/2009	Simon Boswell			Plas Issa Farm	S Activity.	D1297/002/01 (3405404)	LBAP[CON]	1
<i>Bombus (Melanobombus) lapidarius</i> (Large Red Tailed Bumblebee)	SJ3849	04/07/2000	Mike Howe		Field Observation	The Oaks		D0217/001/01 (1057404)	LBAP[FLI]	3
<i>Bombus (Thoracobombus) pascuorum</i> (Common Carder Bee)	SJ3849	04/07/2000	Mike Howe		Field Observation	The Oaks		D0217/001/01 (1057385)	LBAP[FLI]	3
<i>Buteo buteo</i> (Buzzard/Bwncath)	SJ3849	17/03/2009	Norman Hallas	2		Wrexham, Industrial Estate, W		D1297/002/01 (3407863)	Bonn, CITES, LBAP[CON]	1

Statutory Sites intersecting 1000m buffer	None
Wildlife Sites within 1000m (C=Candidate)	Cefn Park (W316) (600m) , Wrexham Industrial Estate (W337) (490m)
NWWT Reserves within 1000m	None
RSPB Reserves within 1000m	None
RIGS within 1000m	None
Habitat type at application grid reference	Semi-improved Neutral Grassland
Habitat type(s) within 1000m	Amenity Grassland, Arable, Buildings, Dense Scrub, Gardens, Improved Grassland, Not Accessed Land, Planted Broad-leaved Woodland, Planted Coniferous Woodland, Planted Mixed Woodland, Semi-improved Neutral Grassland, Semi-natural Broad-leaved Woodland, Standing Water, Swamp, Tall Ruderal Herb
Ancient Woodland within 1000m	Restored Ancient Woodland Site, Ancient Semi Natural Woodland

Important Issues

1. Usage of the above information is governed by Cofnod's **Terms and Conditions of Data Release** (available from Cofnod on request).
2. Records shown in bold typeface are sensitive species records. In this public version of the original report, the resolution of sensitive species grid references have been reduced and site names and comments have been removed.
3. Past records of presence of a habitat or species do not guarantee continued occurrence; absence of records does not imply absence of a species, merely that no records are held at Cofnod; Cofnod cannot guarantee the accuracy of supplied data; copyright of records remains with the original recorder.

Notes

This report should be used in conjunction with any relevant maps, where these are supplied.

Cofnod uses a search system which reports species (usually high priority or protected species) within a specified search radius or buffer. Where required a search will also include high priority 'Mobile Species', such as bats, otters, amphibians and certain invertebrates, which lie outside the specified search radius. These species are highlighted on the report with an **asterisk**. They have been selected as 'Mobile Species' as their territory (possibly due to foraging activity or life cycle) could intersect with the search radius. The list of 'Mobile Species', invasive non-native plant species and species categories used in Cofnod's reporting system can be found at <http://www.cofnod.org.uk/Enquiries.aspx> under the 'Species Categories' tab.

Records with 4 figure grid references are displayed as 1km squares on any relevant maps. They are listed separately in reports and highlighted in grey *italic* script.

Please note that while we hold Wales Raptor Study Group data for North East Wales we are only permitted to release it to a limited number of trusted partners. We can provide contact details if you would like to contact the Raptor Study Group directly to request species information.

Sites - Designated Sites and non-designated Wildlife Sites within 50m of the grid reference are highlighted in red. Wildlife Sites which remain unconfirmed by the relevant Local Authority are given 'Candidate' status and are displayed with the (c) suffix. The following reasons for candidate status apply: 1. Anglesey and Flintshire Wildlife Sites were identified by survey but have not been formally confirmed. 2. Conwy and Gwynedd Wildlife Sites were identified by survey and air photos and remain candidate until evaluated using selection criteria.

Dataset ID - All species records within the reports include Dataset ID codes, which can be used to find the relevant Metadata, using the **Data We Hold** page on the Cofnod website (www.cofnod.org.uk/DataWeHold.aspx). The number below the Dataset ID is the individual record ID. Please quote this if you need more information on a specific record.

'V' column - Record Verification Level. The following abbreviations apply: **1**: Unassessed, **2**: Unconfirmed, **3**: Considered Correct by Cofnod, **4**: Considered Correct by Expert. Dataset Categories and Record Verification Levels are explained in more detail within Cofnod's policy on Data Quality, available from our website.

Maps - This report should be used in conjunction with any relevant maps, where these are supplied. Where Statutory protected sites (e.g. SSSI, SAC, SPA) are displayed on Cofnod maps, more details can be obtained from Countryside Council for Wales. (Visit their website at <http://www.ccw.gov.uk/interactive-maps/official-maps-search.aspx>) Where a Phase 1 Habitat map has been supplied, this illustrates habitats mapped by CCW as part of their Habitat Survey of Wales 1979 to 1997. A separate legend is also supplied.

Lists

BA - Protection of Badgers Act, **BDir** - EU Birds Directive, **Bern** - The Bern Convention on the Conservation of European Wildlife and Natural Habitats, **Bonn** - The Bonn Convention on the Conservation of Migratory Species of Wild Animals, **CCWP** - CCW Priority Species List, **CITES** - Convention on International Trade in Endangered Species, **EPS** - European Protected Species, **HDir** - EU Habitats Directive, **LI** - Locally Important Species, identified by the County Recorder as being of particular importance in the specified Vice-County (see below for a list of Vice-Counties) N.B: Only available for certain species groups and certain areas, **LBAP** - Local Biodiversity Action Plan, **RD1** - Red Data Book listing based on IUCN guidelines, **RD2** - Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce), **S42** - Natural Environment and Rural Communities Act 2006 (Section 42), **UKBAP** - UK Biodiversity Action Plan Priority Species, **WBAm[RSPB]** - Birds of Conservation Concern 2002-07 - Welsh Amber listed birds (not based on IUCN criteria), **WBR[RSPB]** - Birds of Conservation Concern 2002-07 - Welsh Red listed birds (not based on IUCN criteria), **WCA1** - Wildlife & Countryside Act 1981 Schedule 1, **WCA5** - Wildlife & Countryside Act 1981 Schedule 5, **WCA8** - Wildlife & Countryside Act 1981 Schedule 8, **WVP** - IUCN Threat Listing of Welsh Vascular Plants

Abbreviations

ANG - Isle of Anglesey, **CON** - Conwy, **DEN** - Denbighshire, **FLI** - Flintshire, **GWY** - Gwynedd, **SNP** - Snowdonia National Park, **WRE** - Wrexham, **LBAP** - Local Biodiversity Action Plan, **NWWT** - North Wales Wildlife Trust, **RSPB** - Royal Society for the Protection of Birds, **RIGS** - Regionally Important Geodiversity Sites, **WS** - Wildlife Site

Vice-Counties

48 - Meirionethshire, **49** - Caernarfonshire, **50** - Denbighshire, **51** - Flintshire, **52** - Anglesey

Contact Us

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APPENDIX 5

Categorisation of trees for their potential to support roosting bats



Categorisation of trees for their potential to support roosting bats as per the Bat Conservation Trust Bat Surveys - Good Practice Guidelines (2012):

Tree Category and Description	Likely Mitigation Requirements
Known or confirmed roost	The tree can only be felled under EPS license following the installation of appropriate habitat as a replacement.
Category 1* Trees with multiple highly suitable features capable of supporting larger roosts	Further dusk/dawn bat activity surveys required to confirm the presence/absence of bats (May to September only). If bats are found refer to "Known or confirmed roost" above. If no bats are found roosting then the tree should be treated as Category 2 and felled using Reasonable Avoidance Measures (RAMs).
Category 1 Trees with definite bat potential, supporting fewer suitable features than category 1* trees or with potential to be used by single bats	Further dusk/dawn bat activity surveys required to confirm the presence/absence of bats (May to September only). If bats are found refer to "Known or confirmed roost" above. If no bats are found roosting then the tree should be treated as Category 2 and felled using Reasonable Avoidance Measures (RAMs).
Category 2 Trees with no obvious potential, although the tree is of an age and size that elevated surveys may result in cracks or crevices being found; or the tree supports some features which may have some limited potential to support roosting bats.	Trees may be felled using Reasonable Avoidance Measures (RAMs). All works should cease and appropriate advice should be sought if any bats are found.
Category 3 Trees with no potential to support roosting bats.	No mitigation for bats required.





Site C4 Abenbury Way, Wrexham:

**Comparative modelling of impacts on
great crested newts to inform planning.**

D.H. Fletcher, G.C.A. French & J.W. Wilkinson

February 2014

**amphibian and reptile
conservation**



Site C4 Abenbury Way GCN Modelling

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Executive summary

North Wales is a known hotspot for Great Crested Newts (GCNs). Previous ARC work (i.e. Arnell & Wilkinson, 2013) has trialled high resolution (25m) modelling to quantify a number of GCN attributes (e.g. distribution, habitat suitability, importance of metapopulations, etc.) in Anglesey, NE Wales and Powys.

Wrexham industrial estate is located within the boundaries of the aforementioned modelling work. The present work aims to use existing outputs from previous high resolution modelling (Anglesey and NE Wales), namely the resistance surface and the cleaned presence location data, in a comparative analysis. The overarching premise of the work is that a baseline, or current state, can be used as a reference, against which multiple theoretical development scenarios may be compared in order to assess their relative impacts.

The following work represents the development of an objective, data-driven, analysis method that can be used as a decision-making support tool, with regard to the consideration of GCN within the planning process. We utilise graph theory-based connectivity analysis techniques to quantify relative impacts of development options on GCN metapopulations in the localised area around Wrexham industrial estate, the site of a proposed development.

The development's main building footprint was supplied in the format of a shapefile. Locations of proposed mitigation ponds were also supplied in shapefile format. A total of three model scenarios were run: (i) Baseline model – the current state, with no development simulated. (ii) Post-development model – with the development of the area described by the building footprint simulated (i.e. made impermeable to GCN). (iii) Mitigation model – the same as the Post-development model, but with the proposed mitigation ponds added too.

We found that the modelled impacts of development of Site C4 Abenbury Way site (building footprint) on the wider GCN population network appears to be minimal, with no loss of ponds/nodes and the loss of only one link that possesses a low importance value. Whilst the modelled impacts may represent a relatively conservative estimate, the addition of four ponds to the network, as a means of mitigation, appears to compensate more than adequately for the minor loss in connectivity, though is unlikely to represent the optimal mitigation scenario which would comprise ponds located to the east of the development, or to the south to strengthen links to other relatively isolated populations.

Introduction

Great crested newts (GCN) are protected by both British and European law, which together make provision for the protection of the species and its associated habitats. In England and Wales it is illegal to (i) intentionally or deliberately capture, kill, or intentionally injure great crested newts. (ii) Deliberately disturb great crested newts or intentionally or recklessly disturb them in a place used for shelter or protection. (iii) Damage or destroy a breeding site or resting place. (iv) Intentionally or recklessly damage, destroy or obstruct access to a place used for shelter or protection. (v) Possess a great crested newt, or any part of it, unless acquired lawfully. (vi) Sell, barter, exchange, transport or offer for sale great crested newts or parts of them.

Any activity likely to contravene the legislation must be licensed by the appropriate party, whom issues licences for the purposes of “preserving public health or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment” [Regulation 44(2)(e)].

A licence will not be granted unless:

- “There is no satisfactory alternative” [Regulation 44(3)(a)], and
- “The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range” [Regulation 44(3)(b)].

Therefore, any proposed development must show that any damage to the status of GCN must be adequately compensated for. Compensation must amount to the maintenance of conservation status, taking into account population size, viability and connectivity.

Local planning authorities have the responsibility of ensuring that protected species issues are taken into account as a material consideration when determining planning applications. They must also ensure that protected species issues are taken into account in the preparation of Local Development Plans (LDPs). These responsibilities are underlined by Regulation 3(4) of the Conservation (Natural Habitats & c.) Regulations 1994, which require authorities to have regard for the conservation of European Protected Species, such as great crested newts.

When considering options for development plans, it can be costly and time-consuming to undertake detailed surveys at all ponds and GCN presence locations, for the purpose of quantifying impacts. Although it is usually a requirement that any submitted plans are accompanied by full surveys of the areas affected, this is not to say that **all** options considered prior to submission need to be subject to full surveys.

In the interest of optimising allocation of time and resources to full surveys, it would be immensely valuable to be able to assess relative impacts of options, without having to first undertake detailed surveys at all presence locations within the vicinity of candidate development sites. Desktop studies can be useful, in the interest of time and costs; however they still require data on GCN presence. These data are sometimes present, in the form of local/regional records centre data, but rarely provide much beyond the species’ presence or absence.

The present study utilises Species Distribution Modelling (SDM) in order to quantify the potential value of populations at GCN presence locations and incorporates this data into a wider, landscape-level connectivity analysis. The connectivity analysis uses a resistance surface, which can be modified to reflect proposed developments, to model the likely movement of GCN through the landscape between locations of known presence. By using a metric that captures both the value of individual habitat patches (ponds/nodes) and the degree of connectivity at a landscape level, it is possible to compare the relative predicted impacts of multiple development scenarios without having to first carry out detailed GCN surveys at all sites. This approach allows many development options/scenarios to be compared with minimal outlay, both in terms of time and money.

Materials and Methods

Software & Data

The following software was used in this study:

- The majority of analysis was conducted in R (R Core Team, 2013), using the 'gdistance' (van Etten, 2012), 'rgdal' (Bivand et al., 2013) and 'raster' (Hijmans, 2013) packages.
- Network analysis was conducted using the Command Line version of Conefor software (Torné & Saura, 2013).
- Composition and creation of map outputs was carried out using ArcGIS 10.2 (ESRI, 2014).

All GCN presence location data used in this study was derived from the Cofnod dataset used in Arnell & Wilkinson (2013). MaxEnt model output and resistance surface GIS layers were all taken from Arnell & Wilkinson (2013). GIS shapefile data describing the proposed candidate development site and detailing the mitigation pond locations was provided by the client.

Study area



Figure 1 – Map showing location of study area.

The proposed development site is located in the Wrexham industrial estate, on the eastern outskirts of Wrexham town, north Wales (see Fig.1 above). The study area is essentially defined by a 2km buffer around the development site. However, after visual inspection we concluded that there were additional GCN records just outside the buffer (predominantly to the north-east), near enough to the study site as to be relevant. The study area was expanded to include these additional records.

Resistance Surface Scenarios

The resistance surface created for the Anglesey and NE Wales project was clipped to the extent of the study area. An unmodified version was used as the baseline “no development” scenario. The remaining 2 scenarios were each represented by a modified resistance surface, where cells of the selected development site was assigned a high value (10000), rendering those cells impermeable to all intents and purposes.

Least Cost Pathways

Calculating Least Cost Pathways (LCPs) is a necessarily processor-intensive procedure, particularly when working at high resolutions. However these calculations can be minimised by limiting the number of pairs of points for which the LCPs are calculated. In this study, we filtered out any pair of points that possessed a Euclidean separation distance exceeding 2000m, a distance beyond which it is reasonable to assume that negligible dispersal occurs.

LCPs were calculated for the remaining pairwise combinations of points (1866 combinations/LCPs in total for the first two scenarios, 1968 for the mitigation scenario). LCPs were calculated for each the baseline, development and mitigation scenarios, which were represented by the resistance surfaces. Line shapefiles containing the LCPs, and their corresponding cost-distance values, as attributes, were generated for subsequent visualisation and map creation.

Graph Construction & Analysis

We used the graph theory software Conefor (see Software section) to highlight populations that are likely to be most important. Graph theory has been used for a variety of applications, including geography and computer science and recently has been employed to provide estimates of connectivity between habitat patches at landscape scale (Minor and Urban, 2007; Saura and Rubio, 2010; Urban and Keitt, 2001). This software is able to calculate a connectivity index (Probability of Connectivity, ‘dPC’) for each population, which is comprised of the habitat quality/patch size of each patch (dPC Intra), the patches’ contribution to connecting between patches (varPC Con) and the position of the patch within the network (dPC Flux) (Saura and Rubio, 2010).

Nodes: The GCN presence points were used as nodes in graph construction. Each of the nodes was assigned a “patch” value, representing some surrogate for habitat value. These “patch” values were derived from the MaxEnt model output from the Anglesey and NE Wales project, on the basis that most suitable locations were of higher habitat value than less suitable locations.

Edges/Links: The LCP cost-distance values were used as edge/link distance values in the graph construction – the higher the LCP cost-distance value, the further apart the two corresponding nodes are.

Conefor Parameterisation: In order to calculate dPC values for the graph objects, thresholds must first be defined. In the context of this study, the threshold relates to dispersal distances. The median dispersal distance used in previous studies was 250m, and as such, was the value utilised in this study also.

As all of our edge/link values are in cost-distance, rather than Euclidean distance, the threshold had to be converted into corresponding units of cost-distance. In order to do this, we calculated an average cost per metre of the LCPs (29.76), which characterises the wider landscape, then multiplied this landscape value by 250 to give a cost-distance of 7440 for median (0.5 probability) dispersal.

For each node, the dPC index and its components were recorded. For each edge/link, the change in overall, landscape PC number associated with its removal from the graph (representing link importance) was recorded. The overall PC number, a measure of combined graph object coherence, was also recorded for each of the scenarios.

Results

Initial, Baseline Analysis (no sites developed)

Those edges/links with cost-distance values above a cost-distance threshold equivalent to a Euclidean distance of 2000m ($2000 \times 29.76 = 59520$) were removed from the final maps, as dispersal beyond this cost-distance is deemed to be negligible, leaving a total of 1509, 1508 and 1543 remaining links for the Baseline, Post-development and Mitigation scenarios respectively.

In the initial baseline model (see Appendix 1) the bulk of pond/nodes are down the eastern side of the study area in a slight crescent shape, wrapping around the industrial estate. They are most densely distributed in the middle, thinning out to the north and to the south. There are a few sparsely distributed nodes to the west of the development site, which are relatively poorly connected to the main part of the network. More important ponds/nodes generally represent those that are better connected, and less important ones generally represent those that are more isolated. Overall pond/node importance (sum of PC components – Intra, Flux and Con) is reflected in the diameter of the corresponding pie-chart.

Due to the relatively dense configuration of the main body of the network of nodes, the links between them are good and numerous. There are some more tenuous links, separating a small sub-cluster in the south of the study area from the main body of the network, but not so much as to be significant. There appears to only be two, relatively low importance links crossing the proposed development site.

Regarding composition of importance/PC metric for each node, 'dPC Con' is very low, almost non-existent, due to the spatial configuration of individual nodes within network components (removal does not increase fragmentation of components significantly). For the main part, the only visible components of PC are 'Intra' (red) and 'Flux' (green). The variations in relative proportions of these components is broadly explained by isolation of the pond/node in question – 'Intra', representing the actual habitat patch value, increases as a function of isolation, thus those ponds/nodes that are more isolated tend to display a higher proportion of red.

Development Scenario

As mentioned above, there are only two, relatively weak links that cross the development site (see Baseline model, Appendix 1), and only one is lost as a result of the development. There are no nodes lost as a result of the development. Beyond the loss of the individual link, there are no significantly discernable impacts on the network through the development of the site (see Post-development model, Appendix2). The loss of the link, which is of relatively low importance, results in a decrease in overall landscape value (PCnum) of just 0.01%, from 2426799 to 2426769 (See Fig. 2).

Mitigation Scenario

Four ponds/nodes were added to land adjacent to the building in the mitigation scenario (see Mitigation model, Appendix 3). The ponds border the development to the northwest and form connections with existing nodes to the northeast and southwest, resulting in the creation of a new link with the northeast node cluster. It should be noted however, that this link is relatively weak and does not replace the link to the main cluster of nodes to the east that is lost due to the development. The addition of four nodes (i.e. habitat patches) to the network, in conjunction with the increase in cohesiveness of the network through improved connectivity results in an increase in overall landscape value (PCnum) of 4.5%, from post-development value of 2426769 to 2535926 (see Fig.2). While this value might be considered as acceptable for mitigation, it is highly unlikely to represent the optimal mitigation scenario, which is more likely to be achieved by placing the new ponds in closer proximity to the main node cluster to the east of the development.

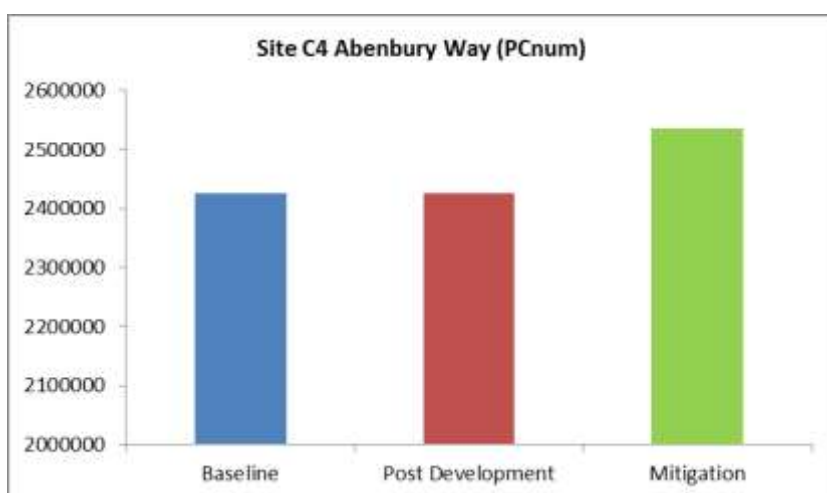


Figure 2 – Graph displaying the overall landscape metric, PCnum (sum of all nodes' components) associated with each scenario. The baseline model, 'no development', is coloured blue, post-development model is coloured red and the mitigation model is green. *Note that Y-axis does not start at zero*

Discussion

Methods

We used MaxEnt output as a surrogate for habitat patch value. The approach could be augmented by the addition of HSI data and ground-truthing. Nevertheless, this approach follows a clear and logical theoretical grounding and in the absence of HSI, or other survey data, may provide a more realistic representation of potential patch habitat value than a simple binary present/absent approach.

Generally, the methods used in this study offer useful insights into the way that the target taxa may use and move through the landscape, although data-imposed limitations must be recognised and considered when interpreting the outputs. For instance, the resistance layers, the basis for LCP creation, are far from a perfect representation of the real world. It is highly probable that barriers exist that are not captured by the data sources used to derive the resistance surfaces (i.e. fences, walls, etc). Furthermore, there is a paucity of research relating to the relative resistance of landcover types to GCN movement – this research would be invaluable in calibrating more accurate resistance surfaces.

Nonetheless, providing the limitations are kept in mind when interpreting outputs, the methods outlined in this study can highlight key areas for potential corridors of dispersal, which can be verified through short-term, focussed surveys (i.e. drift netting). They can also provide a consistent, objective, transparent means of comparing various development scenarios, without the cost of detailed surveys. This could potentially allow planners to consider a greater number of options, refining them through the methods used here, before carrying out more detailed analysis on only the best two or three.

Model Outputs

It is important to note that the comparative analyses carried out in this study, were done so on the strict basis that specific combinations of development sites and nodes (those stipulated by the client) comprised the development scenarios. The authors would recommend the use of extreme caution when trying to extrapolate beyond the remit of the specified combinations of developed sites set out herein. Furthermore, the modelled impact of the development does not necessarily capture the full range of possible negative effects associated with such a development. For instance, the footprint of the building will not be the spatial limit of influences during construction (i.e. people and vehicles moving

around site). However, the identification of important dispersal pathways and ponds should allow planners and developers to minimise impacts through avoiding them where possible.

These analyses elucidate the current structure of the GCN population network in the localised area around the proposed, Site C4 Abenbury Way development site and highlight the links most important to the taxa's dispersal capabilities. The 'post-development' model suggests that there is relatively little impact to the GCN population network through the development of the proposed site; specifically the loss of a single, relatively low importance, link. The 'mitigation' model suggests that the impact of the development is more than compensated for by the addition of four new ponds (under the assumption that these ponds are made suitable for GCNs), though is unlikely to represent the optimal mitigation scenario which would comprise ponds located to the east of the development, or to the south to strengthen links to other relatively isolated populations.

Conclusions

The modelled impacts of development of the Site C4 Abenbury Way site (building footprint) on the wider GCN population network appears to be minimal, with no loss of ponds/nodes and the loss of only one link that possesses a low importance value. Whilst the modelled impacts may represent a relatively conservative estimate, the addition of four ponds to the network, as a means of mitigation, appears to compensate more than adequately for the minor loss in connectivity.

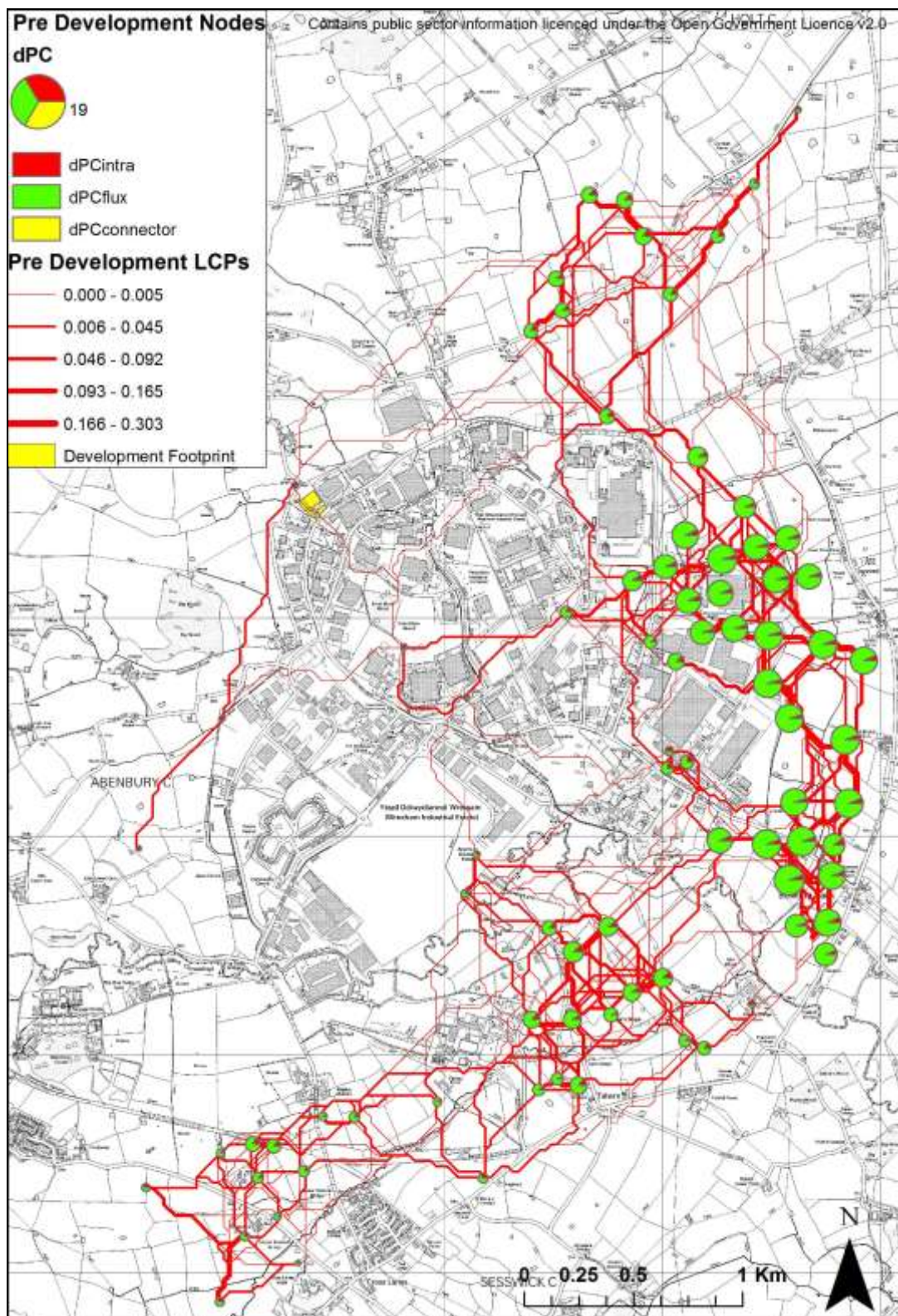
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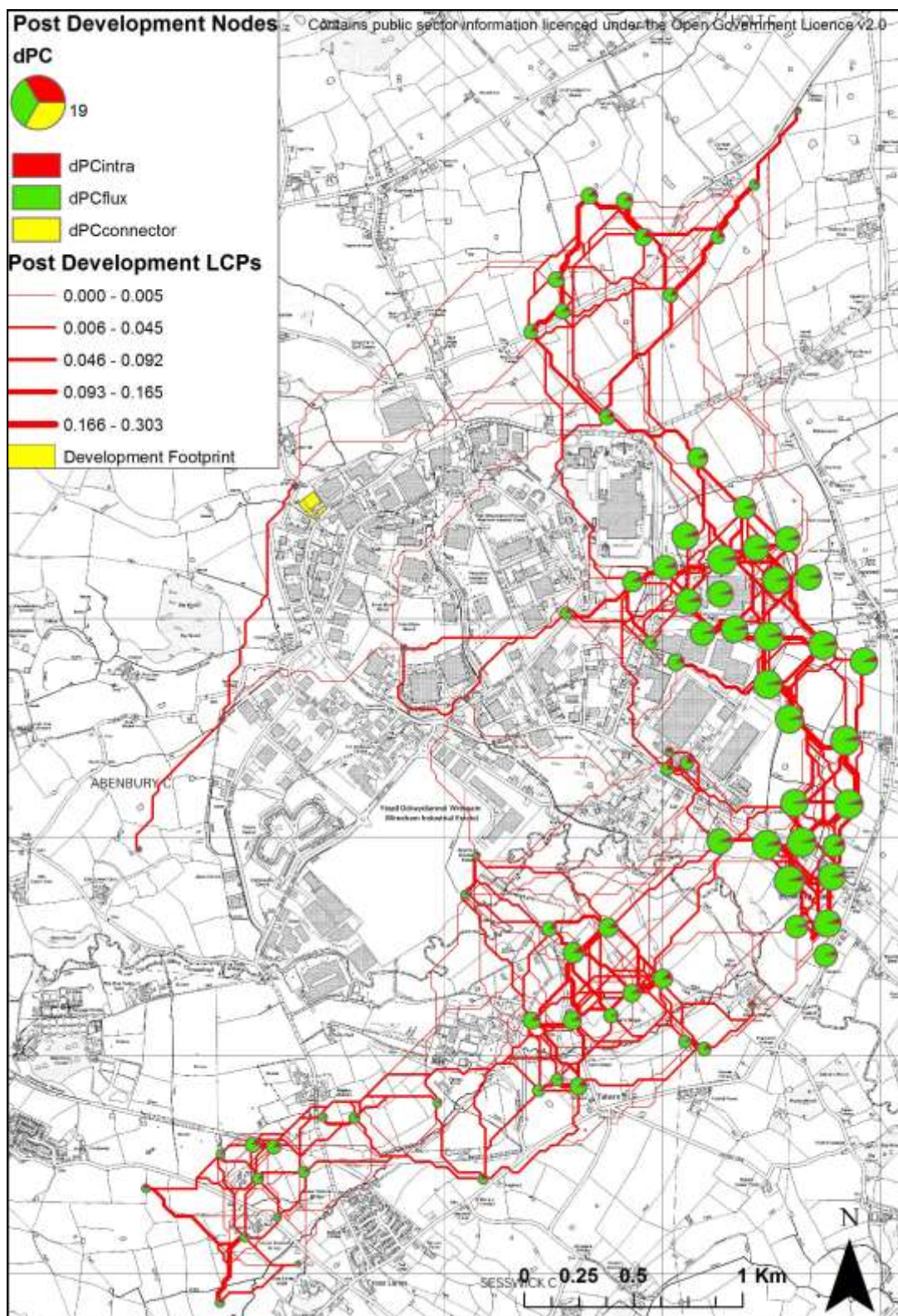
van Etten, J. (2012). gdistance: distances and routes on geographical grids. R package version 1.1-4. <http://CRAN.R-project.org/package=gdistance>

Appendix 1 – Baseline Model (no development).



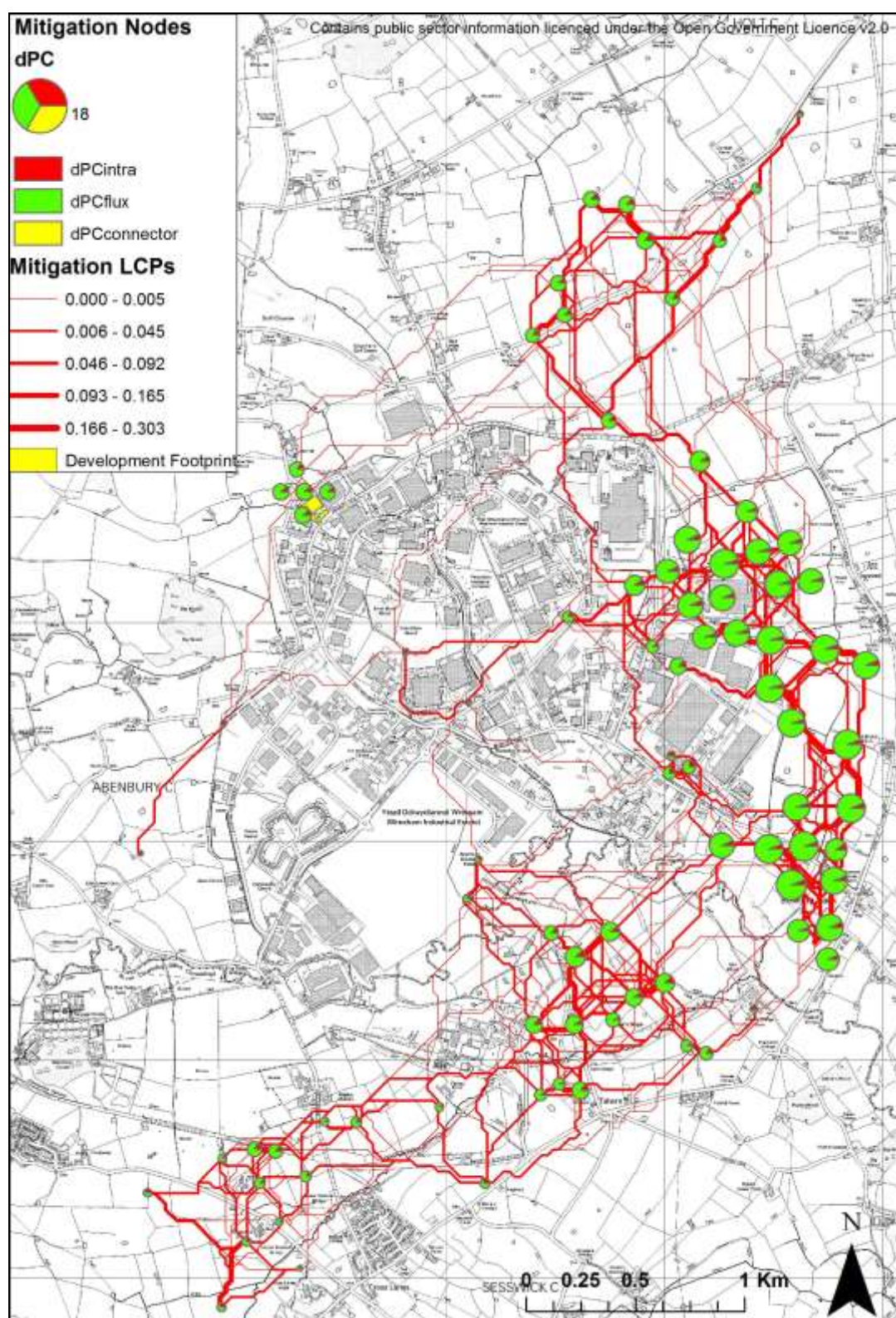
Site C4 Abenbury Way GCN Modelling

Appendix 2 – Post-Development Model (without mitigation)



Site C4 Abenbury Way GCN Modelling

Appendix 3 – Mitigation Model (post-development model with added nodes)



Site C4 Abenbury Way GCN Modelling



BIOSECURITY RISK ASSESSMENT			
Activity/Task: General Site Activities During Site Construction and Post Construction Monitoring.			Date: 25.06.14
Project: Wrexham Industrial Estate Plot C4			Revision : 0
Carried out by: James Bilham		Environmental Coordinator: Peter McComiskey	
The function of the Biosecurity Risk Assessment is to identify all possible INNS and known diseases that could harm or negatively impact upon the environmental conditions on site. All known pathways / actions that could result in cross contamination from one site to the next are identified and appropriate mitigation and reasonable avoidance strategies are recorded.			
AQUATIC HABITATS			
Environmental Element	Assessment	Presence	Additional comments
Aquatic habitats	Are aquatic habitats present on site?	No	There is 1 pond located within 20m of the site boundary and ponds located within 2km of the site
	Are aquatic habitats proposed as part of development including mitigation or compensation scheme?	Yes	Four ponds will be created within the mitigation area to the northern end of the site.
Assessment of Plants within aquatic habitats	Are invasive species recorded at ponds subject to survey?	No	Not Applicable
AMPHIBIAN SURVEYS AND TRAPPING			
Environmental Element	Assessment	Results	Additional comments

Great Crested Newts (GCN)	Mitigation - Construction (Main Works)	Reasonable Avoidance Measures (RAMs)/ Translocation	The construction area will be fenced and amphibians/GCN translocated prior to start of construction, additional mitigation areas will be fenced (one-way fencing) and work supervised under RAMs. Four new ponds are to be created. Habitat creation and enhancement will also be undertaken in the mitigation area to the northern end of the site and adjacent to Erlass Road.
	Total number of ponds post construction (monitoring) to be surveyed	Four newly created ponds on site	The completion date for construction is March 2016 after which the monitoring period will begin. Monitoring will be undertaken for a minimum of 21 years post construction
	Geographical Extent of all surveys carried out per annum	Terrestrial and aquatic habitats within the site only	Both terrestrial and aquatic habitats will be monitored as part of these surveys
	Range of all surveys carried out per annum	Not Applicable	Not Applicable
	Amphibian monitoring - Method of surveys undertaken.		Combination of nocturnal torchlight surveys, egg searching and netting of ponds monitored within the mitigation area
TERRESTRIAL HABITATS			
Environmental Element	Assessment	Presence	Additional comments
Terrestrial habitats	Are terrestrial habitats present on site?	Yes	Mixed semi-improved grassland habitats with small woodland and scrub areas
	Are plant INNS present on site?	No	
Materials	Does the scheme include the removal of soils or any	No	No material will be removed from site
	If yes please state reception area(s) if known?		
	Will the scheme require the import of material from	No	

INNS	Do site visitors, workers including contractors, sub-contractors, and their vehicles work on or visits other sites where INNS are present or likely to be present?		Yes for TACP unknown for other site visitors	It is to be assumed that all workers will come in contact with INNS and therefore appropriate control measures will be applied.
	Are procedures in place to reduce risk of accidental		Yes	
		If yes, please state actions.		All site workers are made aware of the risks of and procedures with regard to INNS and all equipment and machinery used within INNS contaminated areas are cleaned prior to removal. Movement of machinery and equipment from external sites where INNS is present is discouraged and where this is necessary decontamination measures are put in place to ensure that no INNS are imported from elsewhere. Monitoring for the presence of INNS species is ongoing and will continue during post construction
		If no please confirm why		
Landscaping	Does the scheme include any landscaping?		Yes	The scheme will combine various landscape elements in order to retain existing habitat where possible and enhance and replace that which is lost. Landscape elements will include - species rich grassland, scrub planting, refugia/hibernacula creation, brash/log piles from vegetation clearance and water bodies with associated planting.

	Does the landscaping scheme include planting invasive non native species?	Yes	Planting proposed to be incorporated within the mitigation will include scrub vegetation consisting of native species where possible and native tree species will be use where additional trees are proposed to be planted.
	If yes which species?		
Actions to Minimize Risks: Ensure all site staff are aware of the potential for presence of INNS and the procedures required to minimise their spread Avoidance of working within water-bodies wherever possible Cleaning of all equipment and machinery where work is required within waterbodies during construction Use of site specific monitoring equipment and cleaning of all equipment after each survey Cleaning of all equipment and PPE, especially footwear, after each survey Consider surveying ponds supporting invasive species last Best practice to be applied in accordance with ARG-UK Advice Note 4			
Completed By: James Bilham		Date: 25.06.14	
Approved by:		Proposed Review date:	

2134/JB

24/06/2014

Biosecurity Risk Assessment Introduction

The Biosecurity Risk Assessment identifies all Invasive Non Native Species (INNS) and any known diseases that could potentially be present or be introduced that could harm or impact upon species and the environmental conditions present on site. All actions that could result in contamination from one site to another are identified within the Biosecurity Risk Assessment table.

No INNS species were identified within Plot C4 as part of the Ecological Assessment undertaken by JW Ecological Ltd in June 2013, however some areas of the site were survey restricted due to the presence of scrub or trees. If any areas of the site are found to contain INNS at any time during the works, then these areas will be treated and cleared in accordance with the Environment Agency Best Practice Guidelines, with monitoring being undertaken to ensure that these measures have been successful.

Landscape proposals have been developed, as part of the mitigation plan to ensure that no INNS are included. All plant stock shall be inspected and approved prior to planting. Planting areas will be monitored throughout the 21 year post-construction period, ensuring that INNS do not establish.

Due to the presence and creation of water-bodies on site there is a risk of contamination and the spread of INNS, in particular during construction and mitigation work and during the post construction monitoring period. Any work, including surveys, undertaken within existing water-bodies will follow the guidelines given within the Biosecurity Risk Assessment to ensure that INNS and water-borne diseases are not brought onto the site or spread within the site. These measures include informing all site staff of the potential biosecurity risks, the use of site specific equipment and machinery wherever possible and the thorough cleaning of all equipment and machinery used.

Audit Conditions	Licence Condition	Notes	Licence Condition Met? (Yes/No)	Required Action (s)	Audit Condition Met?	Signed
GCN licence available on site						
Licensed ecologist overseeing site works at the required level						
Site works supervised by ecologists (those listed as accredited agents or assistants only)						
Necessary site management and/or monitoring have been produced and implemented correctly						
All avoidance measures being applied as required						

All necessary licence permits completed as necessary						
Changes required to licence methodology addressed appropriately – work stopped and NRW/WG consulted						
Confirmation that all site staff have been inducted						
Confirmation that all site staff have received the necessary tool box talks						
All exclusion and one way fencing checks and repairs undertaken and recorded						
Habitat creation works implemented correctly						

Name

Signature

Date