

Low Barugh, Barnsley
Ecological Mitigation and
Management Plan

November 2015

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Contents

1	Introduction	2
2	Project Description	4
3	Relevant Legislation and Policy	5
4	Ecological Baseline Conditions	7
5	Ecological Mitigation Measures and Supporting Method Statements	10
6	Implementation and Control	18
7	Checking and Corrective Action	20
8	Action Plan (incorporating Method Statement and HMP Actions)	21
9	References	23
	Figure 1	24
	Appendix 1: Great Crested Newt (GCN) Habitat Management Plan (HMP)	25

1 Introduction

Background and Context of the Ecological Mitigation and Management Plan (EMMP)

- 1.1 The site is the proposed location of new residential housing occupying an area of approximately 10 ha of former arable land which is located to the southeast of Dearne Hall Road in Low Barugh, Barnsley, centred at OS grid reference SE 317 087. Residential housing and Dearne Hall Road form the north-western site boundary. Industrial premises are located to the south of the site, and the eastern site boundary is formed by a live railway line.
- 1.2 Barratt Yorkshire West & David Wilson Homes (BDW) who are intending to complete purchase of the site, received outline planning permission for the development of the site for residential use with associated public open space, landscaping and link road (Application No: 2013/0280). This is subject to the discharge of planning conditions. Planning Conditions 18 and 25 both relate to ecology:

Condition 18: *“Prior to commencement of development full details of the mitigation measures identified in the Ecological Survey prepared by BSG Ecology (March 2013), including a timetable for their implementation, shall be submitted to and approved in writing by the Local Planning Authority. The development shall be implemented in accordance with the approved details.”*

Reason: *To conserve and enhance biodiversity in accordance with Core Strategy Policy CSP 36.*

Condition 25: *“Prior to the commencement of development details of a scheme for biodiversity enhancement shall be submitted to and approved in writing by the Local Planning Authority. The approved details shall be implemented prior to occupation of the building and retained as such thereafter.”*

Reason: *In the interests of enhancing biodiversity in accordance with Core Strategy policy CSP36 Biodiversity and Geodiversity.*

- 1.3 The site layout, presented in Figure 1, shows the distribution of housing, road infrastructure and public open space across the site. This layout has been prepared in consultation with the scheme ecologist to ensure that the ecological mitigation measures have been incorporated. Accordingly, the large pond (Pond 1) and the broadleaved woodland have all been avoided, and adequate buffers have been provisioned alongside these ecological receptors.

Scope and Structure of the Ecological Mitigation and Management Plan

- 1.4 The EMMP describes the way in which the project will be controlled to satisfy the general requirements to safeguard ecological receptors and mitigate the adverse effects of the project during site preparation and construction. It also addresses, where appropriate, any beneficial measures that will be taken to enhance the nature conservation value of the site.
- 1.5 Details regarding great crested newt (GCN) mitigation are presented in Appendix 1: GCN Habitat Management Plan (HMP), which will be separately required by Natural England as part of a European Protected Species (EPS) mitigation licence application. In preparing the EMMP and HMP consideration has been given to the requirements of BS42020¹.
- 1.6 In order to facilitate environmental management for the project the EMMP will be structured in the following format:
- Section 1 provides a general background to the project and outlines the framework for the document.

¹ BS42020 (2013) *Biodiversity. Code of practice for planning and development*

- Section 2 describes the project, proposals and construction programme.
- Section 3 outlines the legislation relevant to the project, incorporates a schedule of licences and approvals required, and highlights any relevant planning constraints which are applicable to the project.
- Section 4 details the baseline conditions.
- Section 5 describes the predicted impacts upon ecological receptors and the ecological mitigation measures to be developed and implemented. These mitigation measures are subsequently described more fully in best-practice method statements, detailing the construction control procedures to be followed. These are illustrated where appropriate on Figure 1, which shows where construction activities are restricted and where protective measures will be installed or implemented. The following Method Statements have been identified:
 - Vegetation Clearance.
 - Provision of Artificial Roosting/Nesting Features.
 - Amphibian-Friendly Drainage.
 - Lighting Scheme.
- Section 6 covers the environmental management of the construction works, outlining the management structure established and training required to deliver the project.
- Section 7 describes the checking and corrective procedures for the project including inspection, incident reporting and auditing processes.
- Section 8 provides an Action Plan which summarises all management projects and indicates the timing and estimated year in which they are to be carried out. The Action Plan consolidates details from both the Method Statements and the GCN HMP.
- Appendix 1: GCN HMP.

CDM Regulations

When BSG Ecology designs construction work, as defined in the Construction (Design and Management) Regulations (CDM), we will comply with our statutory duties. Where our design is not construction work, as defined, we do not have any CDM duties.

BSG Ecology will not be responsible for any design undertaken by other companies whether they be a 'designer' or a contractor, except where noted in relation to sub consultants appointed by BSG Ecology who are not based in GB or Northern Ireland.

BSG Ecology will attend site to review the quality of the works and resolve any issues arising out of unforeseen circumstances but will not "control the way in which any construction work is carried out by a 'person at work' (CDM Regulations 25(2)). BSG Ecology will not carry out construction work.

When BSG Ecology is the contract administrator we will not have any responsibility in relation to permitting the works to start (CDM Regulation 16) or the on-going adequacy of the Construction Phase Plan or welfare provisions by the contractor.

2 Project Description

Site Description

- 2.1 The site is presently composed of two former arable fields, which were cultivated until summer/autumn 2014, with hedgerows and fencing located at the southern, eastern and northern boundaries. Two ponds are located at the eastern side of the fields, which are linked and surrounded by marshy grassland and swamp vegetation. A wet ditch is located to the east of these ponds. Semi-mature broadleaved woodland is located on the railway embankment, and semi-mature broadleaved woodland with areas of neutral grassland is located on a section of disused railway located at the south-eastern site boundary. Two residential properties are situated at the southwestern corner of the site.
- 2.2 For the purposes of this document, the site is divided into three broad areas: the Construction Area, the Formal Parkland Area and the Wildlife Area.

Project Overview

- 2.3 The project involves the construction of up to 175 dwellings, with associated infrastructure, including: roads, drainage, lighting, signage and public open space.

Construction Program

- 2.4 The following is the indicative Construction Program:
- Habitat Manipulation in advance of works: November 2015-February 2016.
 - Site Preparation (Vegetation Clearance): April 2016 onwards.
 - Site Establishment: April / May 2016.
 - Civil Works, drainage and foundations: April 2016 – October 2017.
 - Soft Landscaping (away from main construction area): April 2016 – December 2016.
- 2.5 It is anticipated that approximately 35-40 plots will be constructed per year, which equates to a 4-5 year build programme, ending in 2021.

3 Relevant Legislation and Policy

European and National Legislation

- 3.1 The site supports and has the potential to support a range of legally protected species. The ecological management of site should ensure that actions taken are not to the detriment of legally protected species and where possible should encourage the conservation of these species within the site.

European protected species

- 3.2 The Conservation of Habitats and Species Regulations 2010 consolidates the various amendments that have been made to the Regulations. The original (1994) Regulations transposed the EC Habitats Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Council Directive 92/43/EEC) into national law.
- 3.3 “European protected species” (EPS) are those which are present on Schedule 2 of the Conservation of Habitats and Species Regulations 2010. All species of bats and GCN are included on the Schedule. They are subject to the provisions of Regulation 41 of those Regulations. All EPS are also protected under the Wildlife and Countryside Act 1981 (as amended). Taken together, these pieces of legislation make it an offence to:
- a. Intentionally or deliberately capture, injure or kill any wild animal included amongst these species
 - b. Possess or control any live or dead specimens or any part of, or anything derived from a these species
 - c. deliberately disturb wild animals of any such species
 - d. deliberately take or destroy the eggs of such an animal, or
 - e. intentionally, deliberately or recklessly damage or destroy a breeding site or resting place of such an animal, or obstruct access to such a place
- 3.4 For the purposes of paragraph (c), disturbance of animals includes in particular any disturbance which is likely—
- a. to impair their ability—
 - i. to survive, to breed or reproduce, or to rear or nurture their young, or
 - ii. in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
 - b. to affect significantly the local distribution or abundance of the species to which they belong.

Breeding birds

- 3.5 All nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs.

Common Reptiles

- 3.6 All species of British reptile are protected by the Wildlife and Countryside Act 1981 (as amended). The common species (adder, grass snake, slow worm and common lizard) are only protected against intentional killing and injuring (but not taking).

Badger

- 3.7 Badgers are protected under The Protection of Badgers Act, 1992. This act makes it an offence to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it.

Species and Habitats of Principal Importance

- 3.8 Planning authorities have a duty under Section 40 of the NERC Act 2006 to ensure that species of principal importance are protected from the adverse effects of development, where appropriate, by using planning conditions or obligations. They should also refuse permission where harm to the species or their habitats would result unless the need for, and benefits of, the development clearly outweigh that harm. Section 41 of the NERC Act 2006 requires a list to be prepared of those habitats and species of principal importance.
- 3.9 Paragraph 117 of the NPPF indicates that local authorities should take measures to “*promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species*” linking to national and local targets through local planning policies. Priority species are those species shown on the England Biodiversity List published by the Secretary of State under Section 41 of the NERC Act 2006.
- 3.10 The ecological management of the site should therefore promote the quality of existing and proposed new habitats listed under Section 41, and aim to increase opportunities for Section 41-listed species.

Invasive non-native species

- 3.11 It is an offence to plant or otherwise cause to grow in the wild invasive non-native plants listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). This effectively means that it is an offence to cause the spread of such plants as a result of development operations.

Licences and Approvals

- 3.12 GCN population size class assessment surveys undertaken in 2012 and 2014 identified a large ‘size class’ population of GCN breeding within the large on-site pond. GCN and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended), and by the Conservation of Habitats and Species Regulations 2010 (as amended). Although the law provides strict protection to GCN, it also allows this protection to be set aside (derogation) under Section 53 of the Conservation of Habitats and Species Regulations 2010 through the issuing of licences. These licences in England are currently determined by Natural England (NE) for development works and are known as European Protected Species (EPS) mitigation licences.
- 3.13 An EPS mitigation licence will be secured in advance of construction to enable GCN to be excluded across the development area of the site prior to the start of site preparation/construction activities. A full strategy for great crested mitigation at the site will be included in the Method Statement of the EPS mitigation licence. However, further detail regarding the creation and management of habitats specifically for GCN is set out in the GCN HMP (Appendix 1).

4 Ecological Baseline Conditions

4.1 The site was subject to a range of ecological surveys in 2012 and 2014 which were reported in BSG Ecology's Ecology Report (reference: 3568.02_R_APPR_271113) and GCN Survey Report (reference: 3568.04_R_APPR_250614).

4.2 Surveys undertaken by BSG Ecology in 2012 and 2014 include:

- GCN survey (2012, 2014)
- Extended Phase 1 habitat survey (2012)
- Breeding Birds Survey (2012)
- Bats – ground-based assessment of trees (2012)
- Bats – daytime and activity survey of buildings (2012)
- Bats – activity survey across site including remote survey (2012)

4.3 A summary of the existing baseline condition of the site is set out below.

Designated Sites

4.4 There are no statutory designated sites of nature conservation interest located within 1.5 km of the centre of the site. Three non-statutory Natural Heritage Sites are situated within 1.5 km of the centre of the site. The nearest, Daking Brook, is situated 120 m to the northwest of the site at its nearest point (OS grid reference SE 316 090). Daking Brook forms a tributary to the River Dearne, and is designated for its *“value to a range of wildlife including water vole and bats.”*

Habitats

4.5 The site is 10 ha in size and currently comprises two recently set-aside arable fields, with fields with hedgerows and fencing located at the boundaries. A large pond is located within an area of marshy grassland at the eastern side of the largest field. This pond varies significantly in size throughout the year depending on the levels of precipitation. A wet ditch is located to the east of the pond, at the eastern field boundary. A second, smaller pond is located within an area of swamp that is becoming colonised by scrub. This is centrally located towards the south of the site. A disused railway is located in the southeastern section of the site, supporting semi-mature broadleaved woodland and areas of neutral grassland.

A line of mature Lombardy poplar trees bisect the two former arable fields and there are two residential houses located within the site boundary at the southwestern corner of the site. There is a small area of amenity-managed grassland, dominated by perennial rye-grass, located at the southwestern corner of the site, separated from the main arable field by a fence.

4.6 The predominant habitats within the site presently are:

- Recently set-aside arable fields, which are becoming colonised with a mosaic of arable weeds and ruderals following 12 months of the land remaining fallow.
- Swamp vegetation with scattered scrub and trees.
- Two ponds.
- Marshy grassland.
- Wet ditch.
- Semi-improved neutral grassland.
- Broadleaved woodland.

- Amenity-managed grassland.

Protected Species and Otherwise Notable Species

4.7 A brief summary of relevant protected/notable species is set out in Table 1.

Table 1: Protected and Otherwise Notable Species of Potential Relevance to the Site

Taxa	Presence on Site	Description
Birds	No Schedule 1 species present. Six Species of Principal Importance under the provisions of the NERC Act 2006.	The results of the data trawl provided records for 34 species of high or medium conservation concern within 1.5 km of the centre of the site. None of these records appears to relate to the site itself. A total of 34 bird species were recorded during the breeding bird surveys. Six of the species recorded (dunnock, house sparrow, linnet, reed bunting, song thrush and starling) are Species of Principal Importance under the provisions of the NERC Act 2006. Four of these species are of high conservation concern: house sparrow, linnet, starling, song thrush. Seven species are of medium conservation concern: dunnock, swallow, reed bunting, willow warbler, kestrel, mallard and whitethroat. The remaining species are of low conservation concern or have no formally recognised status.
Bats	No roosts identified. Up to five species of bats use the site for foraging and commuting, two of which (noctule and soprano pipistrelle) are Species of Principal Importance under the provisions of the NERC Act 2006.	The data trawl provided ten records for bats within 1.5 km of the centre of the site dating from 1981-2011, none of which relates to the site itself. The nearest record is from a location approximately 210 m to the east of the site. The two buildings and three of the trees within the site have features that could support a bat roost, although detailed survey carried out in 2012 found no evidence of roosting bats in these features. Activity surveys conducted during 2012 found that up to five bat species are using the site for foraging and commuting: common pipistrelle, soprano pipistrelle, noctule, Daubenton's bat and a <i>Nyctalus</i> species. The results show that bat activity is generally positively correlated to boundary features, in particular the broadleaved woodland and larger pond within the eastern part of the site, the line of Lombardy poplars separating the two arable fields and the hedge line located just outside the southern part of the site.
GCN	The larger on-site pond (Pond 1) supports GCN.	The larger on-site pond supports a breeding population of GCN. Surveys have revealed a 'large' population size-class to be present at this pond. No GCN were recorded within the smaller on-site pond. Habitat immediately surrounding the breeding pond is favourable for terrestrially occurring newts. The railway corridor and the well vegetated fringes that form the eastern boundary of the site are likely to be especially important for amphibian dispersal, and offer foraging and hibernating habitat. The interconnected semi-mature broadleaved woodland and areas of neutral grassland associated with the disused railway in the southeastern section of the site are also likely to offer optimal terrestrial habitat for GCN. This habitat will be unaffected by the development.

Taxa	Presence on Site	Description
		Notwithstanding this, much of the site comprises land which until very recently has been under arable crop rotation. Thus, large areas of the site are of relatively limited value to terrestrially occurring GCN. One area however, that will be directly affected by the development and which includes favourable habitat for terrestrially occurring GCN is the area of scrubby, swamp habitat centrally located to the south of the site.
Water vole	No evidence	The data trawl provided two records of water vole along the disused canal, 210 m to the east of the site. No evidence of water vole was located along the wet ditch situated along the eastern boundary of the arable field or within either of the two ponds.
Reptiles	No evidence	The data trawl did not provide any records for reptiles within 1.5 km of the centre of site and no reptiles or evidence of reptiles was found during the survey.
Badger	No evidence	The data trawl did not provide any records for badger within 1.5 km of the centre of site and no evidence to suggest the presence of badger was located during any of the surveys.

Ecological Constraints

- 4.8 The Ecology Report (2013) and GCN Survey Report (2014) highlight the ecological constraints associated with the undeveloped site.

5 Ecological Mitigation Measures and Supporting Method Statements

5.1 The ecological mitigation measures listed in Table 2 are based on a précis of the key 'baseline conditions' and 'statutory requirements' described in the previous section, together with a summary of the proposed mitigation for the project, as identified in the Ecology Report (BSG, 2013) and the GCN Survey Report (BSG, 2014). Table 2 should be read in conjunction with following the Method Statements starting at Section 5.3:

- Method Statement 1: Vegetation Clearance.
- Method Statement 2: Provision of Artificial Roosting/Nesting Features.
- Method Statement 3: Amphibian-Friendly Drainage.
- Method Statement 4: Lighting Scheme.

5.2 Mitigation necessary for GCN is set out in Appendix 1: GCN Habitat Management Plan (GCN HMP). In some cases there is overlap in terms of the benefits to GCN AND to other ecological receptors; so to avoid unnecessary repetition reference is made to relevant projects of the GCN HMP as appropriate (rather than repeating information in the present EMMP document).

Table 2: Ecological Measures

Ecological Receptor	Impact on Baseline Conditions	Specific Mitigation Proposed	Time Constraint
GCN breeding pond (Pond 1)	Risk of pollution to main GCN pond and degradation of water environment from release of sediment or contaminants arising during construction phase	Maintain buffer zone to main GCN pond (Pond 1), which will be kept hydrologically distinct from the SUDS to be incorporated into site by a minimum 40 m buffer, which forms the Wildlife Area boundary. See GCN HMP (Project 5.3 - Monitor and maintain exclusion fencing).	Ongoing during site preparation and construction phases
Small non-breeding pond and surrounding swamp habitat	Loss of smaller pond and surrounding habitats	Creation of new wildlife pond (Pond 2) and associated wetland habitat in Wildlife Area to compensate for loss. See GCN HMP (Project 1-1 Create pond).	Ongoing during site preparation and construction phases
Retain sensitive features of ecological value	Risk of damage to features of ecological value (ponds, trees, neutral grassland) caused by incursions by vehicles / machinery in absence of mitigation	Create and maintain protection zone by erection and maintenance of GCN perimeter fencing. The temporary and permanent exclusion fences will form a barrier to all construction activities associated with the Project. See GCN HMP (Project 5.3 - Monitor and maintain exclusion fencing).	Install fences in March / April 2016 (ongoing maintenance during construction)

Ecological Receptor	Impact on Baseline Conditions	Specific Mitigation Proposed	Time Constraint
Nesting birds	Harm to nesting birds caused by vegetation clearance taking place during the nesting bird season	Advanced vegetation clearance to permit GCN fence installation. See GCN HMP (Project 5.1 - Install fencing). Advanced clearance of trees and scrub within Construction Area See Method Statement 1. Management of habitat to deter nesting birds and use of bird exclusion/deterrent devices in project-critical construction areas. See Method Statement 1. Provision of artificial nesting features for birds to compensate for loss of established semi-natural vegetation See Method Statement 2.	Advanced clearance of trees & scrub in Nov / Dec 2015 Exclusion/deterrent devices/methods implemented from March 2016.
Bats	Inappropriate lighting, particularly any positioned near the woodland and ponds, may detrimentally affect commuting and foraging bats	Adopt best practice guidance on bats and lighting to produce lighting strategy for the development. See Method Statement 4. Provision of artificial roosting features for bats to compensate for loss of established semi-natural vegetation See Method Statement 2.	April 2016 (ongoing during construction phase)
GCN	In absence of mitigation, killing or injury of GCN during construction, associated with damage/ loss of terrestrial habitat.	Translocation of GCN from the development site, under EPS mitigation licence from Natural England. Maintain buffer zones from semi-natural vegetation that is to be retained and provision of new terrestrial habitat to replace high quality habitat lost to development. See GCN HMP (Appendix 1). Amphibian-friendly drainage to be incorporated into areas of the site closest to the Wildlife Area and Formal Parkland Area. See Method Statement 3.	Trapping between March-May 2016, subject to suitable weather conditions
Invasive species	Risk of spread of invasive plant species	Control New Zealand pygmyweed in existing pond (Pond 1) and incorporate measures to prevent its spread into new pond (Pond 2) or off-site. See GCN HMP (Projects 1-2, 1-6 and 1-10).	Ongoing during site preparation and construction phases

Method Statement 1: Vegetation Clearance***Rationale***

- 5.3 All habitats within the site have the potential to support nesting birds, particularly scrub and trees, but also the areas of former arable, which may support ground-nesting birds. Sensitive removal of trees and scrub will be the first to be targeted, which will be necessary to enable the GCN fencing to be installed (see Project 5.1, GCN HMP), and also to remove other woody vegetation from the construction footprint. Ground-level vegetation clearance will not be possible until GCN have been trapped-out from relevant parts of the site, including the Formal Parkland Area and the Construction Area (see GCN HMP (Appendix 1)). Even simple operations such as driving vehicles or walking regularly across the site may potentially result in disturbance or damage to nests that are in use.
- 5.4 All birds, including their nests, are protected under the Wildlife and Countryside Act 1981 (as amended). In order to avoid impacts upon nesting birds the approach below will be adopted.

Equipment/Machinery

- 5.5 Strimmers and chainsaw.
- 5.6 Bulldozer / 360° Excavator / tractor and plough for field areas to remove vegetation and invert topsoils.
- 5.7 Bird deterrent devices.

Timing

- 5.8 Tree removal and scrub clearance (i.e. above-ground vegetation clearance) should take place before March 2016, before nesting birds may be encountered. Careful removal will be required, in order to reduce the risk of disturbance to the ground vegetation, prior to newt trapping.
- 5.9 All other vegetation clearance (e.g. across former arable land) can only take place once GCN have been trapped-out from a given part of the site.

Working Method***Habitat Manipulation***

- 5.10 Site Ecologist (SE) to give a 'Toolbox Talk' to the site clearance team before works commence.
- 5.11 The following habitat manipulation works will take place in advance of construction and outside the bird nesting season (i.e. between November 2015 – February 2016):
- Removal of trees and scrub within the development/formal landscaping footprint (i.e. within the area of swamp habitat, and removal of selected Lombardy poplar trees). This will take place using hand-tools and chainsaws, and a single cut (under supervision of an SE) will take vegetation to 100 to 150 mm above ground level outside of the nesting bird season. Once GCN trapping is completed the vegetation can then be uprooted.
 - Clearance of easements along proposed route of GCN fencing (see Figure 1, GCN HMP), within areas of tall vegetation, particularly the swamp vegetation. This will take place using a strimmer, and vegetation will be strimmed to 10 cm above ground level in a 4 m wide easement within areas with suitability to support nesting birds (under supervision of an SE).

Deterrence of ground nesting birds

- 5.12 Site Ecologist (SE) to monitor and advise on issues relating to ground nesting birds.

- 5.13 Bird deterrent devices² should be deployed across the development area of the site from March 2016 in order to avoid, as far as practicable, issues associated with ground nesting birds that could be encountered. The devices should be moved weekly in order to reduce the risk of habituation by birds.
- 5.14 Any vegetation clearance that needs to take place during the bird nesting season (March to August inclusive) must be preceded by an inspection for nesting birds by the SE. Should nesting birds be present, then clearance in these areas should stop until young have fledged, which may extend to the end of August.
- 5.15 As soon as compartments are cleared of GCN (typically between April and May 2016), provided nesting birds are absent, these will be maintained in an unsuitable condition for the duration of the Project in order to prevent future nesting bird issues. This can be achieved through any of the following measures:
- regular ploughing; or
 - topsoil strip using excavator / bulldozer.

Measurement of Outcome

- 5.16 The effectiveness of measures implemented to deter nesting birds will be monitored by the SE.
- 5.17 No nesting birds will be killed, injured or disturbed as a result of the development.

² Bird scarer kites are considered to be the most effective method given the proximity of residential properties.

Method Statement 2: Provision of Artificial Roosting/Nesting Features***Rationale***

- 5.18 Provide opportunities for nesting birds and roosting bats to contribute to compensate for losses of established semi-natural vegetation, and enhance the natural and local environment.

Equipment / Machinery

- 5.19 Fifteen Schwegler 1FF bat boxes (<http://www.nhbs.com/title/158636/1ff-schwegler-bat-box-with-built-in-wooden-rear-panel>), five Schwegler 1FR bat tubes (<http://www.nhbs.com/title/161276/1fr-schwegler-bat-tube>), five Schwegler No. 17A swift nest boxes (<http://www.nhbs.com/title/177991/no-17a-schwegler-swift-nest-box-triple-cavity>), ten Schwegler Type 24 house sparrow nest boxes (<http://www.nhbs.com/title/173236/schwegler-brick-nest-boxes>) and fifteen Schwegler 2GR Schwegler nest boxes (<http://www.nhbs.com/title/158595>).
- 5.20 Mobile Elevated Working Platform (MEWP) with operator.

Working Method

- 5.21 Materials, including the boxes/tubes and aluminium nails (for attachment of bat boxes) should be ordered in advance of construction for delivery to site.
- 5.22 The suggested locations of nesting and roosting features are presented on Figure 1.

Bat Boxes

- 5.23 During the construction phase of the development bat boxes will be installed onto retained mature trees within the broadleaved woodland at the south eastern edge of the site by contractor, under the supervision of the SE.
- 5.24 The bat boxes will be positioned such that there is a clear flight path from the entrance. They will be located approximately 4m above ground level.
- 5.25 Lighting levels in the area surrounding the bat boxes and any connecting habitat corridors must be kept below 0.5 lux.

Bat Tubes

- 5.26 Bat tubes will be incorporated into the fabric of the garage and substation buildings (ten in total) during their construction. The chosen buildings will be those situated adjacent to dark habitat corridors (broadleaved woodland, ponds and landscaping) towards the southern and eastern ends of the site. Installation of the bat tubes will be supervised by the SE.
- 5.27 The bat tubes will be positioned such that there is a clear flight path from the entrance towards a habitat corridor, such as the woodland or wetland areas. The bat tubes will be located approximately 3-4 m above ground level.
- 5.28 They will be situated away from sources of light, such as windows, street lights and security lighting. Lighting levels in the area surrounding the bat tubes and any connecting habitat corridors must be kept below 0.5 lux.

Bird Boxes

- 5.29 The bird boxes will be incorporated into the fabric of the garage and substation buildings (15 house sparrow and 15 swift boxes in total) during their construction. Installation of the bird boxes will be supervised by the SE.

- 5.30 House sparrows are colonial nesters so nest boxes should be installed in adjacent buildings (two per building) approximately 2 m apart and 3-4 m above ground level. The chosen buildings will be those situated adjacent to habitat corridors such as the broadleaved woodland, ponds and landscaping towards the southern and eastern ends of the site, which will provide immediate cover for this species.
- 5.31 Swift boxes should be positioned 3-4 m above ground level, with a clear flight path from the entrance towards the Formal Parkland Area.

Measurement of Outcome

Bat Boxes

- 5.32 Bat boxes are to be inspected for evidence of use, by a licenced bat ecologist, between March and September, during years 2 and 3 post-installation.
- 5.33 Any bat boxes that have been damaged should be replaced.

Bat Tubes

- 5.34 Barratt Yorkshire West & David Wilson Homes (BDW) is responsible for ensuring bat tubes are installed correctly, and will carry out an inspection post-installation to confirm this is the case. Due to their height above ground level and the anticipated difficulty in inspecting them in terms of access and safety, the bat tubes will not be inspected by the SE post-installation.

Bird Boxes

- 5.35 BDW is responsible for ensuring bird boxes are installed correctly, and will carry out an inspection post-installation to confirm this is the case. Due to their height above ground level and the anticipated difficulty in inspecting them in terms of access and safety, the bird boxes will not be inspected by the SE post-installation.

Method Statement 3: Amphibian-Friendly Drainage***Rationale***

- 5.36 An amphibian-friendly drainage scheme for the site will be developed through collaboration between the drainage engineer for the project and the Site Ecologist. The drainage within the site should be designed sympathetically to reduce the risk of killing/injuring newts, and to reduce the risk of disruption of potential dispersal routes, in particular within the southern and eastern parts of the site in closest proximity to the Wildlife Area and Formal Parkland Area (i.e. where newts are most likely to occur).
- 5.37 In order to reduce the risk of impacts upon newts (and other amphibians) associated with drainage, the approach below will be adopted.

Approach

- 5.38 Bull-nose kerbs (i.e. upstand of 0-2.5cm) will be installed along the roads where newts are most likely to be encountered, i.e. along the frontage of the Public Open Space (Wildlife Area & Formal Parkland Area), within the eastern and southern parts of the site.
- 5.39 It is anticipated that half-battered kerbs will be required along main access road. Wildlife Kerbs (ACO design) (http://www.aco.co.uk/product_detail.php?id=52) will be installed at each gully pot along the main access road, to reduce the risk of newts becoming trapped within gully pots.
- 5.40 The bull-nose kerbs and wildlife kerbs will be installed during the construction of the roads and pavements.
- 5.41 The kerbs will be installed by the contractor, in pre-agreed locations, as per the amphibian-friendly drainage scheme (see Figure 1).

Measurement of Outcome

- 5.42 The installation of kerbs will be reviewed by the drainage engineer to ensure that the features have been incorporated as per the agreed drainage strategy and meet with relevant Highways Health and Safety standards. Any deviation in placement of kerbs would be agreed in consultation with the Site Ecologist.

Method Statement 4: Lighting Scheme

Rationale

- 5.43 A lighting scheme for the site will be developed through collaboration between the lighting specialist for the project and a Site Ecologist. The lighting scheme will be implemented throughout site preparation, construction and operational phases of the development, to ensure that light-sensitive species, such as bats, are not adversely affected by the development.

Approach

- 5.44 The lighting scheme has been developed with reference to current good practice guidance and research, including:
- Bat Conservation Trust (2009). *Bats and lighting in the UK - Bats and the Built Environment Series, version 3*. BCT, London.
 - Bat Conservation Trust (2014) *Interim Guidance: Artificial lighting and wildlife - Recommendations to help minimise the impact of artificial lighting*. BCT, London.
 - Institute of Lighting Professionals (2011) *Guidance notes for the reduction of obtrusive light*. ILP, London.
- 5.45 A maximum lighting limit of 0.5 lux will be maintained along important wildlife corridors (Figure 1). In order to achieve the 0.5 lux limit, the following measures will be incorporated as appropriate:
- Care will be taken to position and angle lighting equipment, and where applicable, the use of directional hoods, to restrict or direct light away from sensitive habitats and features. These include the retained woodland, retained pond (Pond 1), newly-created pond (Pond 2) and surrounding habitats, areas of open space and newly-created nesting / roosting features.
 - The application of close board fencing and hedging will be considered to screen lighting impacts along secondary roads in proximity to the above listed sensitive habitats and features.
 - Light spill will be prevented through use of shrouded downlights on houses that are adjacent to the areas of open space.

Measurement of Outcome

- 5.46 The lighting scheme will be monitored by the lighting specialist to ensure that lighting limits do not exceed 0.5 lux in proximity to important dark corridors for wildlife.

6 Implementation and Control

Roles and Responsibilities

- 6.1 The Site Ecologist (SE) will be the central point for all ecological issues, liaising as appropriate with the Principal Contractor and statutory consultees in order to deliver the short and long term ecological vision for the site. Roles and responsibilities of key personnel are given in the following accounts:

Principal Contractor

- 6.2 Is responsible for:
- Compliance with legal consents relating to nature conservation.
 - Compliance with planning conditions relating to nature conservation.
 - Managing and co-ordinating the environmental aspects of the scheme, including the EMMP and GCN HMP.
 - Providing support to the SE.

Site Ecologist (SE)

- 6.3 Is responsible for:
- Monitoring compliance with the EMMP (in particular the Method Statements) and GCN HMP.
 - Liaison with consultees on ecological matters.
 - Liaison and incident reporting to the Principal Contractor.
 - Site inspections, monitoring and reporting.
 - Provide training and information about the importance of ecologically sensitive receptors to all construction personnel on site through delivery of 'Toolbox Talks'.
- 6.4 The SE will be present at the start of works to ensure the delivery of the works in accordance with the Method Statements, and towards the completion of works in order to certify the quality of the work. It will be necessary for the SE to be present at other times in the interim period, although this will be defined by the complexity of the task and the potential for disturbance to existing sensitive features. Only once the SE is satisfied with the outcome of each item will they be considered as a completed action.

Biodiversity Champion (Appointed by Principal Contractor)

- 6.5 Is responsible for:
- Implementation of the environmental construction including the GCN fencing.
 - Ensure the EMMP and HMP are adhered to on site including checking the integrity of the GCN fence.
 - Ensure the implementation of environmentally sensitive working practices.
 - Site inductions that include ecological considerations.
 - Respond to environmental incidents, and ensure all reporting carried out correctly.
 - Review incidents with Environmental Team to prevent repeat occurrence.
 - Liaise with environmental stakeholders as required.

Competence, Training and Awareness

- 6.6 Training constitutes a fundamental element in ensuring ecological performance improvement; indeed the effectiveness of any system to improved performance is dependent on the adequacy of information held and the application of that information by personnel. All personnel working for or on behalf of BDW should have the appropriate awareness and competence to meet the requirements of the EMMP.
- 6.7 The primary objectives of training are to ensure that:
- Personnel are fully aware of the potential ecological impact of their work and associated ecological issues.
 - Individually and collectively, personnel are committed to the provision of a sound ecological performance.
 - Activities of personnel do not BDW to criticism or legal/financial liability.
 - Effective communication in respect of ecological issues exists within the corporate body.

7 Checking and Corrective Action

7.1 In order to determine compliance with the requirements of the EMMP and GCN HMP, site inspections and audits must be undertaken regularly. These will be carried out by the following processes:

- Regular site inspections, carried out by the SE, in accordance with this report.
- Audits, in accordance with the BDW / Principal Contractor's environmental management systems.
- All records of evaluation will be maintained and controlled in accordance with BDW / Principal Contractor's environmental management systems; and in accordance with BS42020 requirements.

Inspections

Site Ecologist - Inspection Report

7.2 The SE will undertake detailed site inspections to measure environmental compliance with the EMMP and GCN HMP. The inspection frequency will be determined by the occurrence of critical works at times of the year when disturbance to sensitive ecological receptors is likely to be greatest. For the duration of the construction phase of the project, inspections every 8 to 12 weeks may be appropriate.

Biodiversity Champion - Fortnightly Inspection

7.3 The Principal Contractor nominated Biodiversity Champion will undertake an Environment inspection on a fortnightly basis. The aim of routine workplace inspections is to detect and rectify the simple and mainly obvious hazards that can often be the cause of accidents or environmental incidents.

Non-Conformance, Corrective and Preventative Action

7.4 All ecological non-conformances will be recorded on an Incident Investigation and Report form generated by the SE or the Principal Contractor's Biodiversity Champion or Environmental Manager. Dependent on the severity of the non-conformity differing actions may be required; these range from the adaptation of working practice, additional Tool Box Talks being required or in severe cases the involvement of statutory bodies such as the Environment Agency as appropriate.

Reporting and Meetings with Stakeholders

7.5 In the absence of any guidance on the period of time across which the site would be managed, this EMMP is based on the period 2016 to 2021, fully encompassing the construction period. In order to keep the EMMP updated and relevant to site operations, an annual review will be carried out, and a summary report produced. This will be an opportunity to report on the status of features of nature conservation value, informed by the ongoing monitoring events. Allied with this, the annual reviews will also enable a process of fine-tuning, allowing for the alteration or addition of new management projects to the work programme for subsequent years.

7.6 Site meetings with stakeholders will most likely need to be convened. Due to the substantive site works taking place in the first two years of the implementation of the EMMP there will be a more pressing need for annual meetings. However, once the management becomes more regular and the monitoring reveals typical results the requirement for annual meetings will diminish.

8 Action Plan (incorporating Method Statement and HMP Actions)

	Responsibility	Timing	2015	2016	2017	2018	2019	2020	2021
Method Statement 1: Vegetation Clearance									
Pre- site clearance habitat manipulation (all woody vegetation in construction footprint and easement of GCN fence lines)	BDW, SE	November to mid-February	✓	(✓)					
Installation and maintenance of bird deterrent devices	BDW, SE	from March		✓					
Deliver Toolbox Talk to site clearance contractors	SE	April onwards		✓					
Soil strip of areas fully trapped of GCN and released for construction	BDW	April onwards		✓	✓				
Monitor effectiveness of bird deterrent/exclusion methods	BDW, SE	Weekly checks once installed		✓					
Method Statement 2: Provision of Artificial Roosting/Nesting Features									
Installation of bat and bird features	BDW, SE	Not restricted		✓	✓	✓			
Inspection of bat boxes (Schwegler 1FF only)	SE	Post-installation (March – September)				✓	✓		
Method Statement 3: Amphibian-Friendly Drainage									
Provision of amphibian-friendly drainage scheme for development	BDW	Not restricted		✓	✓				
Method Statement 4: Lighting Scheme									
Provision of lighting strategy and lux plan for development	BDW	Not restricted		✓	✓				
Management Plan - Feature 1: Ponds									
1-1. Create pond	BDW, SE	November to mid-February	✓	(✓)					
1-2. Dredge and deepen pond P1	BDW, SE	November to mid-February		(✓)	✓				
1-3. Monitor GCN and fish within pond habitat	SE	5 visits conducted between April to June			✓	✓	✓	✓	✓
1-4. Monitor availability of egg laying plants	SE	June-August			✓	✓	✓	✓	✓
1-5. Monitor status of shading on pond margin	SE	June-August			✓	✓	✓	✓	✓
1-6. Monitor status of non-native species	SE	June-August			✓	✓	✓	✓	✓
1-7. Monitor status of invasive emergent vegetation	SE	June-August			✓	✓	✓	✓	✓
1-8. Plant species suitable for GCN egg laying	BDW / MC, SE	April or September-October	As directed by SE						
1-9. Scrub and tree clearance	BDW, SE	November to mid-February	As directed by SE						
1-10. Control invasive emergent and submerged vegetation	BDW / MC, SE	November to mid-February	As directed by SE						

	Responsibility	Timing	2015	2016	2017	2018	2019	2020	2021
Management Plan - Feature 2: Grassland and Scattered Scrub / Shrubs									
2-1. Create grassland in the Formal Parkland Area (Zone G2)	BDW, LA, SE	September (optimal)		✓					
2-2. Monitor structural composition of grassland and scrub in Zone G1	SE	June-mid July (i.e. prior to cutting)			✓	✓	✓	✓	✓
2-3. Manage grassland in Zone G1	BDW / MC, SE	Cut in mid-July to early August	As directed by SE						
2-4. Manage grassland in Zone G2	BDW / MC, SE, LA	Cut wildflower grassland between mid-Aug & mid-Sept. (2nd cut may be undertaken during May) Cut amenity grassland to LA specification			(✓)	✓	✓	✓	✓
Management Plan - Feature 3: Woodland and Dense Scrub									
3-1. Create woodland patches and wooded belt in Formal Parkland Area	BDW, LA, SE	November-March		✓	(✓)				
3-2. Monitor tree / shrub health	SE / LA	June-August			(✓)	✓	✓	✓	✓
Management Plan - Feature 4: Hibernacula									
4-1. Construction of hibernacula	BDW, SE	November to mid-February	✓	(✓)					
4-2. Monitor condition of hibernacula	SE	June-August		✓	✓	✓	✓	✓	✓
Management Plan - Feature 5: GCN Fence									
5-1. Install fencing	BDW, SE	spring 2016 (once issued with EPS licence)	✓						
5-2. Remove fencing	BDW / MC, SE	March to October (as set out in the Work Schedule of the GCN Method Statement)		✓	✓	(✓)		(✓)	(✓)
5-3. Monitor fencing	BDW / SE	Twice monthly: March-October; monthly: November-February		✓	✓	✓	✓	✓	(✓)
Implementation and Control of EMMP and HMP									
Environment inspection	BDW	Fortnightly, from March until end of construction phase		✓	✓	✓	✓	✓	✓
Ecological compliance visit	SE	Every 8 – 12 weeks (or other period as appropriate), from March until end of construction		✓	✓	✓	✓	✓	✓
Reporting	BDW, SE	Annual Report		✓	✓	✓	✓	✓	✓

9 References

Bat Conservation Trust (2009). *Bats and lighting in the UK - Bats and the Built Environment Series, version 3*. BCT, London.

Bat Conservation Trust (2014) *Interim Guidance: Artificial lighting and wildlife - Recommendations to help minimise the impact of artificial lighting*. BCT, London.

BSG Ecology (2013). *Low Barugh, Barnsley: Ecology Report, 3568.02_R_APPR_271113*.

BSG Ecology (2014). *Low Barugh, Barnsley: Great Crested Newt Survey Report, 3568.04_R_APPR_250614*.

BS42020 (2013) *Biodiversity. Code of practice for planning and development*

Institute of Lighting Professionals (2011) *Guidance notes for the reduction of obtrusive light*. ILP, London.

Figure 1



- LEGEND**
- Site boundary
 - Proposed mitigation measures - bats and birds**
 - Dark corridor maintained to encourage continued use of site by bats
 - Indicative locations for provision of 20 bat roosting boxes and 30 bird nesting boxes, to be fixed to garages, substation building and retained mature trees
 - Woodland belt
 - Retained tree belt
 - Proposed mitigation measures - amphibians**
 - Amphibian-friendly feature - bull-nose kerbs (0-25mm upstand)
 - Amphibian-friendly feature - ACO newt-friendly kerbs alongside gully pots

BSG | ecology

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PROJECT TITLE
LOW BARUGH

DRAWING TITLE
Figure 1: Ecological Mitigation Plan

DATE: 03.11.2015
DRAWN: COH
CHECKED: JF
APPROVED: JF
SCALE: 1:2,000
STATUS: FINAL

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Sources: BSG Ecology survey data; basemap derived from Low Barugh Planning Layout prepared by Sten Architecture

Appendix 1: Great Crested Newt (GCN) Habitat Management Plan (HMP)

Low Barugh

Appendix 1: Great Crested Newt (GCN) Habitat Management Plan (HMP)

Contents

1	Introduction to this Appendix	2
2	Selection of Management Features	3
3	Feature 1: Ponds (Zone P)	5
4	Feature 2: Grassland and Scattered Scrub / Shrubs (Zone G)	11
5	Feature 3: Woodland and Dense Scrub (Zone W)	14
6	Feature 4: Hibernacula (Zone H)	16
7	Feature 5: GCN Fence (Zone F)	18
8	Reporting	20
9	Action Plan (incorporating Method Statement and HMP Actions)	21
	Appendix 1: Figures	23

1 Introduction to this Appendix

- 1.1 The great crested newt (GCN) Habitat Management Plan (HMP) accompanies the Ecological Mitigation and Management Plan (EMMP).
- 1.2 Given the large size of the population and predicted moderate impact of the development, Natural England will require the production of a standalone HMP in support of a European Protected Species (EPS) mitigation licence application. Accordingly, the present report (GCN HMP) has deliberately been separated from the EMMP as this will be required by Natural England.
- 1.3 The GCN HMP describes the habitat creation, management and monitoring of features important to GCN. These actions will take place over a 5 year period for the duration of the construction starting in 2017 (the year following GCN capture and exclusion).

Structure

- 1.4 The GCN HMP will be structured in a standard format, as follows:
- Section 1.0 provides context to the requirement for management of features important to GCN at the site;
 - Section 2.0 describes features of value for GCN, which will subsequently become Management Features;
 - Sections 3.0 to 7.0 describe in detail the five Management Features, which include SMART objectives and management projects for each of these features;
 - Section 8.0 defines the mechanism for annual reporting and review of the HMP.
 - The Action Plan which summarises all management projects and indicates the timing and year in which they are to be carried out has been merged with Method Statement actions of the EMMP, and is included at Section 9.0.

2 Selection of Management Features

2.1 Based on the site description, and an understanding of GCN ecology, it is possible to arrive at five features of value to GCN at the site. These features are habitats or structures which are important for maintaining the favourable conservation status of GCN at the site. Management of semi-natural habitats including ponds, grassland, scrub and woodland will benefit other fauna at the site, including foraging bats and reptiles such as grass snake that may be present towards the periphery of the site.

2.2 Below, each feature is considered in turn and is allocated a management zone / identity, which relates to its location on the site (Figure 1, Appendix 1). Of the management zones, various sub-zones are also identified to assist in directing management actions at the site. Two distinctions in terms of management will be between zones that are within the Wildlife Area (furthest east and south of the site) and zones within the Formal Parkland Area (between the residential units and Wildlife Area).

Ponds – Zone P

2.3 Zone P is entirely within the Wildlife Area.

2.4 Pond P1 is an existing pond, which supports a large breeding population of GCN. Pond P2 is a pond that will be created before capture and exclusion of GCN takes place.

2.5 Management prescriptions for Pond P1 are highly restricted due to access difficulties posed by its proximity to the railway line (to the east), and by the widespread coverage of the highly invasive New Zealand pygmyweed.

Grassland and Scattered Scrub / Shrubs – Zone G

2.6 Zone G1 will comprise tussocky grassland and scattered scrub located around the existing and proposed new pond within the Wildlife Area, in the eastern part of the site.

2.7 Zone G2 will comprise patches of grassland used for recreation, which will be created in the Formal Parkland Area.

Woodland and Dense Scrub – Zone W

2.8 Zone W will feature patches of woodland (and scrub) that will be planted with native species of tree. These patches will be located within the Formal Parkland Area. A wooded belt will be established that provides a gradual shift from the Wildlife Area to the Formal Parkland Area.

Hibernacula – Zone H

2.9 Zone H includes five hibernacula that will be constructed to the specification detailed in the GCN Mitigation Guidelines, within the Wildlife Area.

GCN Fencing – Zone F

2.10 Zone F refers to the network of GCN fencing across the site. External perimeter fencing provides a barrier between the main area of the development where construction will be taking place and the Formal Parkland Area and Wildlife Area. Once GCN have been captured from the main construction footprint they will be excluded from this until the development is completed.

2.11 Temporary fencing will be erected that primarily lies in the Formal Parkland Area and will be used to assist in the capture and temporary exclusion of GCN from areas in which potentially harmful landscaping operations will be taking place (such as topsoil stripping and seeding of grassland).

Structure for Management Feature Entries

- 2.12 Having identified five Management Features, and indicated the zones in which they are located, the next section (3.0 to 7.0) describes management objectives for each feature, and a series of habitat creation, management (and monitoring) projects are recommended that are capable of meeting these objectives.

Management Objective

- 2.13 This is a clear, site-specific description of the desired state for each feature. It includes the following:
- *Management Vision*: A description of a feature in favourable status in the short to medium term (e.g. next 5 - 10 years).
 - *Targets*: Targets are linked to the management vision. They provide the evidence required in order to determine whether or not favourable status is being met, and allow progress to be monitored. Targets should be both achievable and quantifiable, with upper and lower limits set wherever possible.
 - *Current Status*: This provides a summary of the current status of each feature.
 - *Explanation of Targets*: This part explains why the targets have been set and describes the work required to achieve favourable conservation status, taking into consideration the current status.

Management Projects

- 2.14 The management projects are recommendations put forward to help achieve the desired management vision, and maintain favourable conservation status of the GCN population at the site.

3 Feature 1: Ponds (Zone P)

Management Objective

Management Vision

- 3.1 Aquatic and marginal plants flourish in the two ponds within Zone P, both of which are fringed by just the occasional shrub. The variety of plants provides suitable cover and egg-laying spots for amphibians, particularly GCN, which spend much of their time foraging in the surrounding woodland and grassland. Other amphibians, water birds and invertebrates thrive in this wetland environment.

Targets

Target 1. BREEDING GREAT CRESTED NEWTS

- Upper Limit: not required
- Lower Limit: a combined large 'size class' meta-population comprising a peak count of 100 GCN present across both ponds.

Target 2. EGG LAYING PLANTS

- Upper Limit: not required; and
- Lower Limit: five native aquatic / marginal plant species¹ present in ponds in Zone P covering 10% of pond area.

Target 3. SCRUB AND SHADING

- Upper Limit: scrub and trees cast shade over 40% (average) of ponds in Zone P; and
- Lower Limit: not required.

Target 4. NON-NATIVE SPECIES

- Presence of New Zealand pygmyweed is only tolerated in Pond P1.
- Any species listed in Schedule 9 of the Wildlife and Countryside Act will not be tolerated in Pond P2.

Target 5. INVASIVE EMERGENT VEGETATION

- Upper Limit: at ponds in Zone P, emergent vegetation covers 50% (average) of the waterbody surface; and
- Lower Limit: not required.

Target 6. FISH

- Upper Limit: not required.
- Lower Limit: Fish present in ponds within Zone P.

Current Status

- 3.2 One pond, in Zone P (Pond P2) will be created during 2015. This pond will help buffer the GCN population in the locality, especially given predicted deterioration of Pond P1 over time as invasive species reduce its condition to GCN.
- 3.3 Pond P1, the existing pond in Zone P is approximately 0.17 ha and is vegetated across its entire surface area. The highly invasive and non-native New Zealand pygmyweed *Crassula helmsii* is present in this pond, and so too is greater reedmace *Typha latifolia*. In an unmanaged state, within

¹ These include: broad-leaved pondweed, curled pondweed, water mint, water forget-me-not, water plantain, great willowherb, lesser spearwort, amphibious bistort, brooklime, gypsywort and flote-grass (*Glyceria* sp.).

as little as a decade these plants have the capacity to completely smother the pond and significantly reduce its value to breeding GCN. Management of this pond to enhance it for GCN is likely to be problematic due to the presence of New Zealand pygmyweed, for which standard management approaches to completely remove the plant can be extremely invasive and damaging to existing inhabitants of the pond. Further to this, management of the pond is only likely to be possible from the western margins due to the proximity of the railway on the eastern margin, which is also clothed in dense and impenetrable scrub.

Explanation of Targets

Target 1: Breeding great crested newts

- 3.4 The best indication of the condition of the GCN population at a site is to assess the size of its population. This is readily identified by undertaking a population assessment of all ponds across the site, following the Natural England survey guidelines (English Nature, 2001). Surveys in 2012 and 2014 have revealed a large population in Pond P1. Accordingly, a lower limit of a large size-class population has been set, against which favourable conservation status can be measured.

Target 2: Egg-laying plants

- 3.5 Native aquatic and marginal plant species can provide a high quality substrate for GCN to lay eggs upon. Encouraging a diversity of native and aquatic marginal plants to grow will therefore facilitate successful breeding and thus the maintenance of a large GCN population at the site. The plants listed at Target 2 are mostly typical plants of ponds in northern England, and are all used by GCN on which to lay their eggs.

Target 3: Scrub and shading

- 3.6 Trees and shrubs growing over and around ponds provide habitat for wildlife, including amphibians which like to have a sheltered place to hibernate in the winter. However, if more than 40% of the water margin becomes shaded; scrub will need to be thinned out. This would allow the light to penetrate into the water, hence enabling aquatic vegetation to develop and preventing excessive build-up of leaf litter. Development of scrub, within the limits defined by Target 3, will be encouraged for ponds in Zone P in order to achieve higher structural complexity and consequently associated species diversity. This in turn will favour GCN.

Target 4: Non-native species

- 3.7 The Wildlife and Countryside Act 1981, states that; "...if any person plants or otherwise causes to grow in the wild any plant which is included in Part II of Schedule 9, he shall be guilty of an offence". Should invasive species listed on Schedule 9 be identified in Pond P2, approved control measures will need to be implemented. The non-native species listed on Schedule 9 are highly invasive, including species such as New Zealand pygmyweed (already present in Pond P1), water fern and Canadian and Nuttall's waterweeds, all of which may out-compete native species with more ecological value for GCN, thus threatening their conservation status at the site.
- 3.8 There will be a need to monitor and contain the spread of New Zealand pygmyweed in Pond P1 so that it does not infest Pond P2. Similarly, other non-native invasive species should be prevented from colonising Pond P2.

Target 5: Invasive emergent vegetation

- 3.9 Without intervention, it is possible that the ponds may be colonised by emergent vegetation such as greater reedmace, which can quickly spread and reduce the areas of open water. The ponds may then become less suitable as breeding habitat for GCN, because open water is required by males for display purposes and dense emergent vegetation will shade the marginal plants preferred by newts for egg-laying. Therefore, targeted removal of emergent vegetation is recommended, in order to maintain a cover of less than 50% of the surface area of ponds in Zone P.

Target 6: Fish

- 3.10 Fish are predators of newt eggs and larvae. The presence of fish therefore restricts the reproductive success of GCN, over time resulting in a reduction in population size and loss of favourable status. Fish presence is not to be tolerated in ponds within Zone P.

Management Projects

Project 1-1	Create pond
Purpose	Increase area of breeding habitat for GCN, given encroachment of vegetation at Pond P1, and limited flexibility to manage this.
Responsibility	Barratt Homes & David Wilson Homes (BDW) and Site Ecologist (SE)
Equipment	Excavator, Strimmer, Pre-planted coir pallets (pond liner?)
Methodology	~ All work to be supervised by SE. ~ Position new pond in area indicated by P2 (see Figure 1). (Topographical survey may be appropriate to fix exact location of pond). NOTE. <u>Location of this pond is within habitat presently of low suitability to GCN, and which is unlikely to support hibernating animals. Therefore the work can take place without a licence with no risk of killing injury or disturbance to GCN.</u> ~ Pond located in recently set aside arable farmland within the receptor area. If necessary, strim ruderal vegetation (arable weeds) to reveal the full footprint of the pond and a buffer to this, where soil will be made into a shallow bund. ~ Dig trial pit in chosen location to identify presence of sticky clay. If clay is absent / not of right structure, a liner may be required to ensure water retention. ~ Pond to measure ca. 500 m² in area (approx. dimensions), with shallow sloping margins, and a maximum (winter) depth of 1.4 m at the centre. ~ Species, many of which are suitable for GCN to lay eggs on will be sourced from a Flora Locale approved supplier (http://www.floralocale.org/page24182) and planted into coir pallets that will be fixed around the pond margin. Plants to be used will include: water mint, gypsywort, water forget-me-not, floating sweet-grass, water plantain and purple loosestrife. For further information on pond creation consult the Pond Creation Toolkit (http://www.freshwaterhabitats.org.uk/projects/million-ponds/pond-creation-toolkit/).
Timing	Undertake between November (2015) to mid-February 2016. This will be outside the active period for GCN, so the works will not interfere with resting, foraging or commuting animals.
Project 1-2	Dredge and deepen pond
Purpose	Increase area of breeding habitat for GCN in pond P1.
Responsibility	BDW & SE
Equipment	Excavator with ditching bucket or, ideally a dredging bucket, geotextile liner.
Methodology	~ All work to be supervised by SE. ~ Working from the western bank, dredge and re-deepen approximately 40 % of Pond 1 under supervision of SE. ~ Lay geotextile liner on the ground next to the work area on which dredged and excavated material will be placed. Cover with another geotextile liner to prevent disturbance and spread of fragments of New Zealand pygmyweed by

	animals. ~ Leave material in place for two days to enable amphibians and aquatic invertebrates to crawl back into the pond. ~ Dispose of material by digging at least 500 mm deep into a designated area of the site (Formal Parkland Area). Disturbed ground can subsequently be re-seeded with grass. ~ Follow Check, Clean, Dry biosecurity procedure on completion of work so that no infected material leaves the site. ~ To prevent rapid re-infestation of excavated area with New Zealand pygmyweed, plant up with egg laying plants, following Project 1-8 guidance.
Timing	Undertake during November to mid-February whilst the principal contractor is on site.
Project 1-3	Monitor GCN and fish within pond habitat.
Purpose	To identify the status of GCN and presence / absence of fish
Responsibility	SE
Equipment	Survey equipment (including bottle traps, torches, pond net etc.)
Methodology	Follow Natural England (English Nature, 2001) guidelines for population assessment (deviating only in undertaking 4 rather than 6 visits). Survey Ponds P1 and P2.
Timing	4 visits conducted between April to June
Frequency	Annually (5 years) between 2017 and 2021
Resulting Action	If fish presence is confirmed in Ponds P1 and P2, seek specialist advice on fish removal; and implement the recommended actions in liaison with SE.
Project 1-4	Monitor availability of egg laying plants
Purpose	To assess the availability of plants upon which GCN can lay eggs.
Responsibility	SE
Equipment	Field guides, hand lens, GPS, recording forms
Methodology	Conduct walkover survey of Ponds P1 and P2. Cover as much of pond circumference as possible. Record marginal plant species and estimate percentage cover of these using the DOMIN scale.
Timing	June to August
Frequency	Annually (5 years) between 2017 and 2021
Resulting Action	Refer to Project 1-8 if upper limit for Target 2 is exceeded
Project 1-5	Monitor status of shading on pond margin
Purpose	To identify the extent to which shading may be constraining growth of marginal and aquatic plants.
Responsibility	SE
Equipment	GPS, recording forms
Methodology	Conduct walkover survey of ponds P1 and P2. Cover as much of pond circumference as possible. Using the DOMIN scale estimate the proportion (%) of the pond over which surrounding shrubs and trees cast shade.
Timing	June to August

Frequency	Annually (5 years) between 2017 and 2021
Resulting Action	Refer to Project 1-9 if upper limit for Target 3 is exceeded
Project 1-6	Monitor status of non-native species.
Purpose	To comply with Section 14 of the WCA, 1981 (as amended), and maintain good pond condition. Note that it is accepted that little can be achieved to eradicate the New Zealand pygmyweed present in Pond P1.
Responsibility	SE
Equipment	Field guides, hand lens, GPS, recording forms
Methodology	Conduct a walkover survey of pond P2. Cover as much of pond circumference as possible. Record presence of non-native species and plot location on GPS.
Timing	June to August
Frequency	Annually (5 years) between 2017 and 2021
Resulting Action	Should any Schedule 9 plants be recorded, consult specialist for advice on the control and eradication of the species; and implement the recommended actions in liaison with SE.
Project 1-7	Monitor status of invasive emergent vegetation
Purpose	To assess the availability of open water for GCN courtship displays
Responsibility	SE
Equipment	GPS, recording forms
Methodology	Conduct walkover survey of ponds P1 and P2. Cover as much of pond circumference as possible. Estimate percentage cover of emergent vegetation using the DOMIN scale.
Timing	June to August
Frequency	Annually (5 years) between 2017 and 2021
Resulting Action	Refer to Project 1-10 if upper limit for Target 5 is exceeded
Project 1-8	Plant species suitable for GCN egg laying
Purpose	To increase the availability of plants upon which GCN can lay eggs in ponds P1 and P2.
Responsibility	BDW, SE
Equipment	Waders, hand tools (e.g. fork, spade, trowel).
Methodology	Under supervision of SE, plant native aquatic/marginal plants specified in Project 1-1 'Pond creation'.
Timing	April or September to October
Frequency	As directed by SE (see Project 1-4)
Project 1-9	Scrub and tree clearance
Purpose	To manage woody vegetation cover around ponds P1 and P2
Responsibility	BDW / Management Company (MC), SE
Equipment	Hazard tape, canes, chainsaw, strimmer and hand tools.
Methodology	~ The extent of woody vegetation to be cut should be clearly marked with

	hazard tape by the SE, taking into account any sensitive ecological features (such as hibernacula). Areas of ruderal vegetation (e.g. nettles and thistles) may also be included, which are best removed by strimming. ~ All stems of the marked vegetation should be cut to within 100 mm of ground level and any stumps treated with an applied translocated herbicide; and ~ Small habitat piles to be left close to the ponds, as directed by the SE, to provide refuge habitat for GCN.
Timing	November to mid-February
Frequency	As directed by SE (see Project 1-5)
Project 1-10	Control invasive emergent and submerged vegetation
Purpose	To increase the availability of open water for GCN courtship displays in Ponds P1 and P2
Responsibility	BDW / MC, SE
Equipment	Hand tools including: garden fork, pond rake, spade
Methodology	~ Using hand tools, remove invasive emergent (and, if necessary, submerged vegetation) and dig up roots/rhizomes to leave open water across 75% of pond. ~ Leave arisings next to pond margin. ~ Dispose of arisings away from pond, as directed by SE. IF NON-NATIVE, INVASIVE SPECIES PRESENT, REFER TO PROJECT 1-2 REGARDING APPROACH TO POND MANAGEMENT
Timing	November to mid-February
Frequency	As directed by SE (see Project 1-7)

4 Feature 2: Grassland and Scattered Scrub / Shrubs (Zone G)

Management Objectives

Management Vision

- 4.1 Tussocky grassland and scattered scrub provides optimal habitat for GCN in the Wildlife Area. Across this habitat GCN avidly forage for slugs and worms and find places for refuge. Formal cutting of grassland in the Parkland Area maintains a more regimented grassland structure, but one which nonetheless provides foraging and dispersal opportunities for GCN (and other amphibians).

Targets

Target 1. Grass structure of Wildlife Area (Zone G1)

- Upper Limit: tussocky grassland cover at 90% and scrub cover at 10%; and
- Lower Limit: tussocky grassland cover at 60% and scrub cover at 40%

Target 2. Grass structure of Formal Parkland Area (Zone G2)

- Upper Limit: no upper limit; and
- Lower Limit: wildflower grassland with sward height of 50 mm across 33% of Zone G2.

Current Status

- 4.2 Much of the Wildlife Area (Zone G1) and all of the Formal Parkland Area (Zone G2) have yet to be established. Existing site conditions in these areas presently comprise arable set aside, following 12 months of the land remaining fallow.
- 4.3 In peripheral parts of Zone G1 (e.g. near to Pond P1 and near to the railway line) grassland is already starting to encroach into the former arable land, giving confidence that more widespread grassland can be readily established in this zone by allowing natural succession to continue unhindered over the next few years. This approach will also be less intrusive to foraging and resting GCN, by working with existing soils and vegetation rather than resetting the clock through soil preparation and reseedling.
- 4.4 Direct seeding with appropriate mixes will be necessary in Zone G2.

Explanation of Targets

- 4.5 Tussocky grassland is favoured by GCN due to the provision of cover and humidity, offering shelter, and also invertebrate prey availability which abounds in this habitat. Over time, in the absence of management, scrub colonises grassland. To maintain the favourable status of tussocky grassland, management (e.g. cutting) will be required to minimise scrub establishment and to remove colonised scrub. The retention of open grassy areas is also important to ensure that there is a suitable route available for machinery / vehicles should any pond management be required.
- 4.6 Grassland management in the Formal Parkland Area aims to provide additional foraging areas for GCN and other amphibians, whilst being aesthetically pleasing for residents of the new housing development. Most of this area will be cut short, as is standard for areas frequently used for recreation and similar pursuits.
- 4.7 However, at least one third of the park grassland area will be dedicated as wildflower grassland. It will have a sward height of at least 50 mm, although for much of the year the vegetation height will be much taller.

Management Projects

Project 2-1	Create grassland in the Formal Parkland Area (Zone G2)
Purpose	To create grassland to provide dual function of an area for recreation for local residents, and foraging for GCN
Responsibility	BDW, landscape architect (LA), SE
Equipment and Materials	Tine or disc harrow, or rake (for small areas). Glyphosate herbicide (or similar). Appropriate amenity grassland seed mix. Flower-rich, neutral grassland seed mix sourced from a Flora Locale approved supplier (http://www.floralocale.org/page24182).
Methodology	Grassland will be established through the sowing of an appropriate seed mix to the specification and method selected by the landscape architect. However, in summary, this is likely to involve the following: ~ Apply foliar applied translocated herbicide to manufacturer's instructions to eliminate arable weeds prior to seeding. ~ The areas to be seeded will be cultivated to an approximate depth of 100 mm using a tine or disc harrow. ~ Seed will be broadcast at the required rate using tractor mounted machinery, or by hand in the smaller areas. Amenity grassland mix will cover between 60 to 70 % of Zone G2, and flower-rich neutral grassland mix will cover 40 – 30 % of Zone G2 (predominantly along the eastern sides). ~ The seeded areas will be lightly rolled using a Cambridge roller (or similar) to achieve contact with the soil. ~ All operations to be undertaken when the soil is moist but not waterlogged. ~ Spot-treat weeds as required using an applied translocated herbicide.
Timing	In September to achieve best results.
Frequency	Complete by 2016
Project 2-2	Monitor structural composition of grassland and scrub in Zone G1
Purpose	To identify whether grassland is establishing through natural succession and that management is appropriate for maintaining a required sward structure and cover of scrub.
Responsibility	SE
Equipment	Recording forms, GPS, plan at appropriate scale.
Methodology	~ Walk the length of Zone G1 (see Figure 1). ~ Measure grass height at ten evenly spaced survey points (mark these with GPS) and, within a 2 m radius from the survey point, estimate: • the proportion (% cover) of surrounding grassland that is tussocky; • the composition of dominant plants; and • the proportion of grassland that has been colonised by scrub.
Timing	June to mid July (i.e. prior to cutting)
Frequency	Annually (5 years) between 2017 and 2021
Resulting Action	Refer to Project 2-3 if Target 1 is not met
Project 2-3	Manage grassland in Zone G1
Purpose	To maintain structural diversity and control scrub encroachment

Responsibility	BDW / MC, SE
Equipment	Tractor and mounted attachments, including flail mower, rowler and baler.
Methodology	~ Mowing will only start once the average sward height has exceeded 100 mm; ~ Mowing should be undertaken in a disorganised fashion so as to leave a small scale mosaic of cut and uncut patches, and increase structural diversity; and ~ Maintain route to ponds for periodical access for pond maintenance through a cut every year (see Figure 1).
Timing	~ Cut in late-July to mid-August; and ~ Mowing will take place during sunny dry conditions and during daylight hours to prevent potential harm to terrestrially occurring GCN.
Frequency	As informed by monitoring Project 2-2
Project 2-4	Manage grassland in Zone G2
Purpose	To maintain GCN foraging and dispersal opportunities across the eastern part of the site.
Responsibility	BDW / MC, SE, LA
Equipment	Lawnmower / Tractor and mounted attachments, including flail mower, rowler and baler.
Methodology	~ Refer to Figure 1 for locations of wildflower and amenity grassland in Zone G2 ~ Cut wildflower grassland in eastern part of Zone G2 (covering ca. 33% of G2) to no less than 50 mm. ~ Areas of amenity grassland to be maintained as per LA specification.
Timing	~ Cut wildflower grassland between mid-August and mid-September. A second cut may be undertaken (if required) during May. ~ Areas of amenity grassland to be maintained as per LA specification. ~ Mowing will take place during sunny dry conditions and during daylight hours to prevent potential harm to terrestrially occurring GCN.
Frequency	~ Undertake a maximum of two cuts a year in wildflower grassland (once grassland has established). ~ Areas of amenity grassland to be maintained as per LA specification.

5 Feature 3: Woodland and Dense Scrub (Zone W)

Management Objectives

Management Vision

- 5.1 Over time, the woodland will start to develop a multi-layered structure with woodland plants such as dog's mercury, lord's and ladies, wood avens, enchanter's nightshade and violets starting to establish. In places shrubs and climbers will form a tangle of vegetation, concealing the occasional fallen limb or trunk, which will provide refuge and hibernation opportunities to GCN.

Targets

Target 1. TREE/SHRUB HEALTH

- Upper Limit: not required; and
- Lower Limit: 70% healthy (young) trees and shrubs

Current Status

- 5.2 Woodland patches are yet to be created, which will be located across the Formal Parkland Area. These patches should be planted up using native species including: ash, silver birch and hazel, with occasional hawthorn and rowan, and alder and grey willow in wetter places. A similar mix of species will be used towards the edge of the Formal Parkland Area, forming a woodland belt between this and the Wildlife Area.

Explanation of Targets

- 5.3 The value of woodland to GCN will improve over time (i.e. as woodland matures); thus providing a more complex environment across which to forage, rest and hibernate. Establishment will occur most quickly when trees are healthy and when competition from tall grasses and other competitive plants is minimal.

Management Projects

Project 3-1	Create woodland patches and wooded belt in Formal Parkland Area
Purpose	To provide terrestrial habitat for GCN
Responsibility	BDW, LA, SE
Equipment	Planting plan, spades, planting stock, guards and stakes
Methodology	~ Referring to the planting plan, mark out planting areas. Transplants to be individually planted at approximately 1.5 m centres, with planting compost added if appropriate. Transplants will be planted to the existing nursery root collar level. ~ Each transplant will be protected by a Tubex 600 mm high tree shelter (80-120 mm diameter; nested) or equal approved and secured by a 750 x 32 x 32 mm softwood timber stake driven in to the ground. The stake will be pressure treated with a water based preservative for long life. Each guard will be secured to the stake by 2 No. ratchet ties 350 mm apart. ~ Use native tree and shrub species including ash, silver birch and hazel with occasional alder, grey willow, goat willow, hawthorn and rowan, sourced from a Flora Locale approved supplier (http://www.floralocale.org/page24182).
Timing	November to March (avoid frosty conditions)
Frequency	Complete by 2017

Project 3-2	Monitor tree / shrub health
Purpose	To assess tree / shrub health
Responsibility	SE / LA
Equipment	Recording forms, GPS
Methodology	~ Conduct a walkover survey of woodland in Zones W. ~ Record presence of damaged / diseased trees within each patch or the wooded belt, and cross reference using a GPS.
Timing	June - August
Frequency	Annually (5 years) between 2017 and 2021
Resulting action	If health of trees or shrubs is poor, consider: ~ Removing and replacing damaged/diseased saplings as required. ~ Removing competitive grasses and weeds from within spiral guards as appropriate; or keep base weed free throughout the season by herbicide applications using an applied translocated herbicide such as glysophate. ~ Removing tree/shrub guards and stakes when plants have become established to allow basal growth to develop.

6 Feature 4: Hibernacula (Zone H)

Management Objectives

Management Vision

- 6.1 Hibernacula of varying sizes are located across the eastern part of the site. These provide abundant frost free cavities and crevices for hibernating amphibians, all conveniently located within the Wildlife Area close to breeding ponds to restrict the encounters with residents of the housing estate during seasonal migrations.

Targets

Target 1. MAINTAIN THE FAVOURABLE CONDITION OF HIBERNACULA

- Upper Limit: not required
- Lower Limit: access and egress points unobstructed and hibernacula are structurally sound.

Current Status

- 6.2 Five hibernacula will be created in the locations shown on Figure 2.

Explanation of Targets

- 6.3 Suitable terrestrial habitat, particularly the overgrown swamp to the south of the site, is being lost as part of the development. With many hundreds of amphibians likely to be occupying the site they need a safe and stable environment for hibernation that is preferably in close proximity to breeding ponds. To compensate for losses and to ensure the favourable status of the resident GCN population is maintained or enhanced, a significant number of hibernacula will be required, and these must be maintained so that they are open for use.

Management Projects

Project 4-1	Construction of hibernacula
Purpose	To compensate for loss of hibernating and resting sites
Responsibility	BDW, SE
Equipment	Excavator, inert material (e.g. brick discards, logs and other inert, coarse material).
Methodology	~ Create five hibernacula at locations shown on Figure 2. NOTE. <u>Location of the hibernacula are within habitat presently of low suitability to GCN, and which is unlikely to support hibernating animals. Therefore the work can take place without a licence with no risk of killing injury or disturbance to GCN.</u> ~ Construction to be overseen by SE ~ Strip turf and remove topsoil (to depth of 150 mm) to create a shallow depression in which the material will be placed ~ Tip material within depression to form a mound 2 m (wide) x 2 m (long) x 1 m (tall) ~ Cap hibernacula with a little soil and turf, ensuring access and egress points to the interior remain largely unobstructed
Timing	Undertake between November (2015) and mid-February (2016). This will be outside the active period for GCN, so the works will not interfere with foraging or commuting animals.

Project 4-2	Monitor condition of hibernacula
Purpose	To assess hibernacula condition
Responsibility	SE
Equipment	Map of hibernacula locations, recording form.
Methodology	~Check that access and egress points are unobstructed ~ Check that hibernacula are free from waterlogging ~ Check for signs of damage such as burning or other interference
Timing	June - August
Frequency	Annually (6 years) between 2016 and 2021
Resulting Action	Repair hibernacula or reposition if condition is not satisfactory.

7 Feature 5: GCN Fence (Zone F)

Management Objectives

Management Vision

- 7.1 A network of newt fencing is necessary to facilitate the translocation of GCN from the works area to a receptor area and keep GCN out of harms way. External perimeter fencing (exclusion fencing) must be maintained in a favourable condition until construction works across the housing development have been completed.

Targets

Target 1. MAINTAIN FENCELINES IN A FAVOURABLE CONDITION

- Upper Limit: not required; and
- Lower Limit: The fence is intact and creates a barrier to GCN movement onto the development site

Current Status

- 7.2 Exclusion fencing will be installed to provide an impermeable barrier to GCN around the works area. Temporary exclusion fencing will be installed and will remain in place until landscaping works are complete. Drift fencing will be required as part of trapping and translocation measures, as set out in the Method Statement. Location of proposed newt fencing is shown on Figure 2.

Explanation of Targets

- 7.3 Newt fencing, especially exclusion fencing which forms a barrier to GCN movement, from a 'safe' undisturbed habitat into an 'unsafe' built environment, must be maintained to prevent the killing and injury to GCN during site construction. For completeness the installation and removal of fencing is briefly covered in the HMP, although its main focus is in guiding the maintenance of the exclusion fence, which, if breached, may result in the most significant harm to GCN.

Management Projects

Project 5-1	Install fencing
Purpose	To create a barrier to newt movement, facilitate capture and exclude GCN from re-entering the works area.
Responsibility	BDW, SE
Equipment	Newt fencing, machinery / hand tools for installation
Methodology	~ Fence installation to be overseen by the SE ~ Fencing will be installed in accordance with the specification and methodology detailed within the Natural England Mitigation guidelines (English Nature, 2001). ~ Prior clearance of scrub and tall coarse vegetation along the easement for the fencing will take place in winter (to a height of 100 to 150 mm above ground level) to prevent potential conflicts with nesting birds in spring. ~ Care will be taken to install one section at a time, in order that incomplete sections, with unconsolidated backfill are never left open overnight. ~ Perimeter fencing will be rigid (minimum 7mm gauge) due to the potential risk of damage caused by workers and subsequently, the first residents of

	the new housing estate. ~ One-way sections will be included along exclusion fences to encourage GCN (and other amphibians) to make their own way into the 'safe' habitat beyond the development site. One-way sections will remain until the exclusion fence is due to be removed.
Timing & Frequency	~ Prior scrub and tall vegetation clearance along easement of fence in November / December 2015. ~ Install fence in spring 2016 (only once a European Protected Species Mitigation Licence has been obtained) as set out in the Work Schedule of the GCN Method Statement.
Project 5-2	Remove fencing
Purpose	To enable construction works to be undertaken (removal of drift fencing) and eventually to enable free movement of newts across the site (removal of exclusion fencing)
Responsibility	BDW / MC, SE
Equipment	Hand tools, bucket / container for safe transferral of GCN (and other amphibians)
Methodology	~ Fence removal to be overseen by the SE ~ Use hand tools to carefully dig out and lift sections of fence out of the ground. Whilst doing so inspect the fence, backfill and trench for amphibians. ~ Transfer captured amphibians into a container kept cool and provisioned with a moss packet. ~ At frequent intervals move captured amphibians to the receptor site for safe release next to hibernacula.
Timing & Frequency	~ Between 2016 and 2021, as set out in the Work Schedule of the GCN Method Statement
Project 5-3	Monitor and maintain exclusion fencing
Purpose	To maintain exclusion fence in favourable condition.
Responsibility	BDW / MC, SE
Equipment	Recording form, GPS
Methodology	~ Walk entire fence-line(s) checking for damage and loss of integrity (e.g. erosion damage, mammal burrows undermining fence, vandalism). ~ If damage/loss of integrity is observed, mark location with GPS and instigate resulting actions.
Timing	For duration of time that exclusion fencing is needed on site.
Frequency	Twice monthly during March to October and monthly during November to February.
Resulting Action	Repair damaged sections as required and as soon as possible to maintain fence integrity and thus favourable condition

8 Reporting

- 8.1 For each of the five Management Features there are some requirements for monitoring by the Site Ecologist, since it is only by regular monitoring that management can be appropriately reviewed and suggestions for improvements made as required. In order to provide documentary evidence of this monitoring and circulate the results to interested parties (i.e. Barratt Homes & David Wilson Homes, Natural England and the Local Authority Biodiversity Officer) annual reporting will be necessary.
- 8.2 For reasons of efficiency it is recommended that this reporting is combined into a single annual report. The contents of this report will vary from year-to-year, depending upon the monitoring programme and management regime for each of the features.

9 Action Plan (incorporating Method Statement and HMP Actions)

	Responsibility	Timing	2015	2016	2017	2018	2019	2020	2021
Method Statement 1: Vegetation Clearance									
Pre- site clearance habitat manipulation (all woody vegetation in construction footprint and easement of GCN fence lines)	BDW, SE	November to mid-February	✓	(✓)					
Installation and maintenance of bird deterrent devices	BDW, SE	from March		✓					
Deliver Toolbox Talk to site clearance contractors	SE	April onwards		✓					
Soil strip of areas fully trapped of GCN and released for construction	BDW	April onwards		✓	✓				
Monitor effectiveness of bird deterrent/exclusion methods	BDW, SE	Weekly checks once installed		✓					
Method Statement 2: Provision of Artificial Roosting/Nesting Features									
Installation of bat and bird features	BDW, SE	Not restricted		✓	✓	✓			
Inspection of bat boxes (Schwegler 1FF only)	SE	Post-installation (March – September)				✓	✓		
Method Statement 3: Amphibian-Friendly Drainage									
Provision of amphibian-friendly drainage scheme for development	BDW	Not restricted		✓	✓				
Method Statement 4: Lighting Scheme									
Provision of lighting strategy and lux plan for development	BDW	Not restricted		✓	✓				
Management Plan - Feature 1: Ponds									
1-1. Create pond	BDW, SE	November to mid-February	✓	(✓)					
1-2. Dredge and deepen pond P1	BDW, SE	November to mid-February		(✓)	✓				
1-3. Monitor GCN and fish within pond habitat	SE	5 visits conducted between April to June			✓	✓	✓	✓	✓
1-4. Monitor availability of egg laying plants	SE	June-August			✓	✓	✓	✓	✓
1-5. Monitor status of shading on pond margin	SE	June-August			✓	✓	✓	✓	✓
1-6. Monitor status of non-native species	SE	June-August			✓	✓	✓	✓	✓
1-7. Monitor status of invasive emergent vegetation	SE	June-August			✓	✓	✓	✓	✓
1-8. Plant species suitable for GCN egg laying	BDW / MC, SE	April or September-October	As directed by SE						
1-9. Scrub and tree clearance	BDW, SE	November to mid-February	As directed by SE						
1-10. Control invasive emergent and submerged vegetation	BDW / MC, SE	November to mid-February	As directed by SE						
Management Plan - Feature 2: Grassland and Scattered Scrub / Shrubs									
2-1. Create grassland in Formal Parkland Area (Zone G2)	BDW, LA, SE	September (optimal)		✓					

	Responsibility	Timing	2015	2016	2017	2018	2019	2020	2021
2-2. Monitor structural composition of grassland and scrub in Zone G1	SE	June-mid July (i.e. prior to cutting)			✓	✓	✓	✓	✓
2-3. Manage grassland in Zone G1	BDW / MC, SE	Cut in late-July to mid-August	As directed by SE						
2-4. Manage grassland in Zone G2	BDW / MC, SE, LA	Cut wildflower grassland between mid-Aug & mid-Sept. (2nd cut may be undertaken during May) Cut amenity grassland to LA specification			(✓)	✓	✓	✓	✓
Management Plan - Feature 3: Woodland and Dense Scrub									
3-1. Create woodland patches and wooded belt in Formal Parkland Area	BDW, LA, SE	November-March		✓	(✓)				
3-2. Monitor tree / shrub health	SE / LA	June-August			(✓)	✓	✓	✓	✓
Management Plan - Feature 4: Hibernacula									
4-1. Construction of hibernacula	BDW, SE	November to mid-February	✓	(✓)					
4-2. Monitor condition of hibernacula	SE	June-August		✓	✓	✓	✓	✓	✓
Management Plan - Feature 5: GCN Fence									
5-1. Install fencing	BDW, SE	spring 2016 (once issued with EPS licence)	✓						
5-2. Remove fencing	BDW / MC, SE	March to October (as set out in the Work Schedule of the GCN Method Statement)		✓	✓	(✓)		(✓)	(✓)
5-3. Monitor fencing	BDW / SE	Twice monthly: March-October; monthly: November-February		✓	✓	✓	✓	✓	(✓)
Implementation and Control of EMMP and HMP									
Environment inspection	BDW	Fortnightly, from March until end of construction phase		✓	✓	✓	✓	✓	✓
Ecological compliance visit	SE	Every 8 – 12 weeks (or other period as appropriate), from March until end of construction		✓	✓	✓	✓	✓	✓
Reporting	BDW, SE	Annual Report		✓	✓	✓	✓	✓	✓

Appendix 1: Figures

(overleaf)



- LEGEND**
- Site boundary
- Zone P - Ponds**
- P1 Pond
- P2 New pond within Wildlife Area
- 50 m radius from pond
- 250 m radius from pond
- Zone W - Woodland and dense scrub**
- Woodland belt
- Retained tree belt
- Native woodland and scrub (indicative location)
- Zone G - Grassland and scattered scrub / shrubs**
- G1 - tussocky grassland and scattered scrub within Wildlife Area (preferred option is for natural succession to grassland and scrub)
- G2 - amenity grassland within Formal Parkland Area used for recreation
- G2 - wildflower grassland
- Attenuation basin (to be managed as amenity grassland)
- Informal 5m wide trackway to be kept free of scrub, enabling access for pond maintenance

BSG | ecology

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JOB REF: 3568.05

PROJECT TITLE
LOW BARUGH

DRAWING TITLE
Figure 1: Habitat Management Plan Zones

DATE: 03.11.2015

CHECKED: JF

SCALE: 1:2,000

DRAWN: COH

APPROVED: JF

STATUS: FINAL

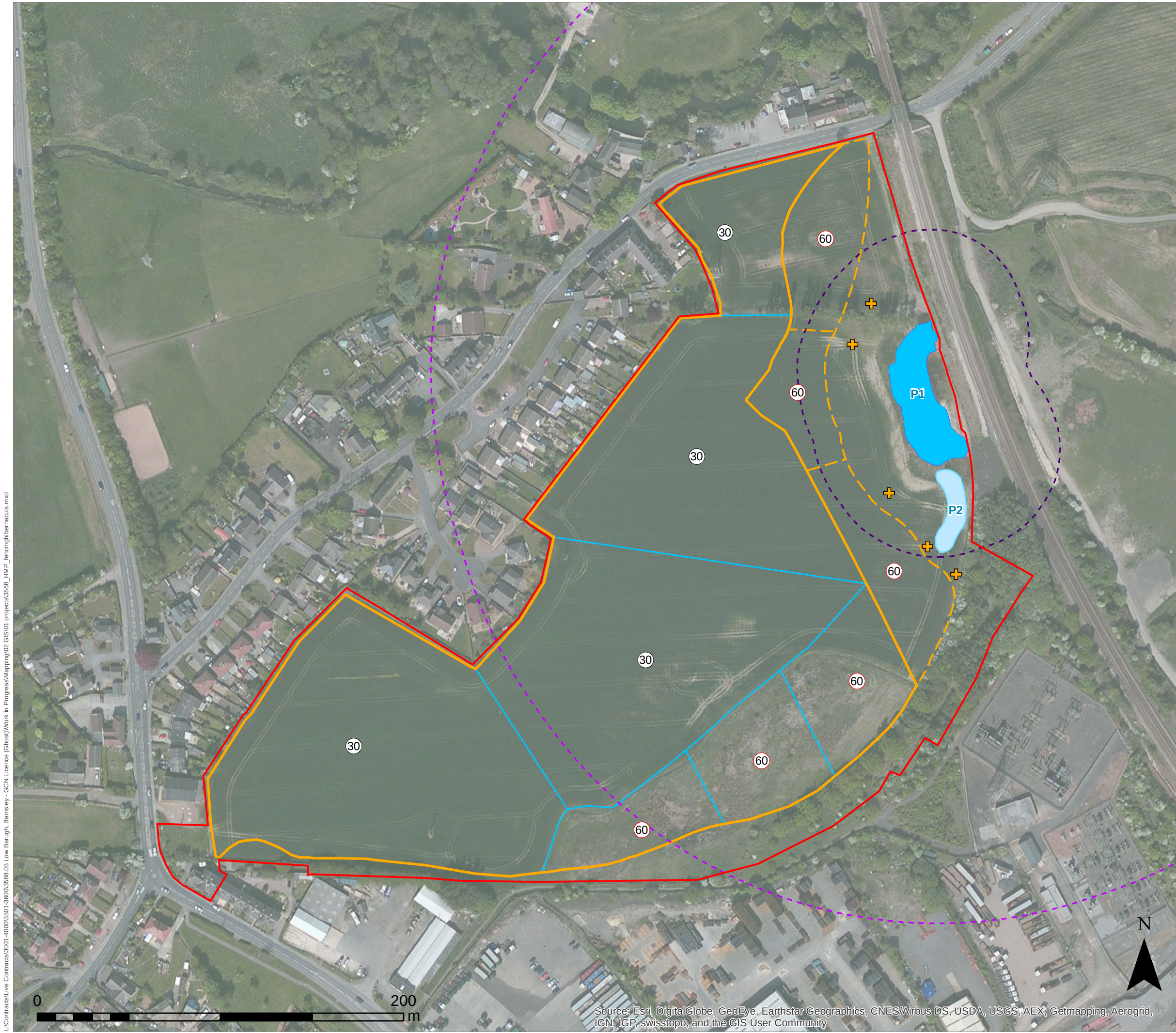
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All dimensions are to be checked on site.
Area measurements for indicative purposes only.

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Sources: BSG Ecology survey data; basemap derived from Low Barugh Planning Layout prepared by Sten Architecture



LEGEND

Site boundary

Zone P - Ponds

P1 Pond

P2 New pond within Wildlife Area

50 m radius from pond

250 m radius from pond

Zone H - Hibernacula

+ Hibernacula (indicative location)

Zone F - Great crested newt fencing

Exclusion Fence

Temporary exclusion and drift fencing while landscaping is underway

Drift fencing

60 Compartment subject to a minimum of 60 days of trapping

30 Compartment subject to a minimum of 30 days of trapping

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PROJECT TITLE
LOW BARUGH

DRAWING TITLE
Figure 2: Fencing and hibernacula

DATE: 27.10.2015
DRAWN: COH
CHECKED: JF
APPROVED: JF
SCALE: 1:2,000
STATUS: FINAL

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No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.

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