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John Grimes Partnership Ltd
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Devon
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WILDLIFE SURVEYS
ECOLOGY TRAINING

29 October 2014

Dear Andrea,

Ecological survey at Yennadon Quarry – October 2014

Thank you for contacting us with regard the ecological survey work that has previously been undertaken at Yennadon Quarry. As you know, the following surveys were undertaken by Acorn Ecology Ltd during 2010 and 2011, and this data was used to compile the Ecology Chapter for the Environmental Impact Assessment.

- Extended Phase 1 Habitat Survey: 9th November 2010
- Reptile Survey: April – July 2011
- Breeding Bird Survey: April – June 2011
- Bat Activity Surveys: June and July 2011
- Butterfly Surveys: April – August 2011
- Badger Sett Monitoring: November 2010, April 2011 and August 2011

A verification survey was undertaken in May 2013, to establish whether there were any significant changes in the habitats present. At that time, the habitats were considered to be similar, with some change in gorse density. However, the potential for protected species to be present was considered to be similar to when the 2010/2011 surveys were undertaken.

As requested, a further verification survey was undertaken in October 2014 to look for significant changes in the vegetation/habitats on site and to identify any new signs of protected species (e.g. new badger setts).

1. Methods

The verification survey was undertaken by me (Sarah Candlin BSc (Hons), MCIEEM) on 28th October 2014. The weather conditions during the survey were 14°C, wind force 2, 100% cloud (low) and dry.

The visit involved conducting a walkover survey of the site and making note of any changes in habitat compared to the survey report dated 9th November 2010, as well as the verification survey dated in May 2014. The potential for protected species to be using the site was re-assessed and a specific search for active badger setts in the area of the proposed extension was undertaken.

2. Survey Results and Discussion

2.1 Habitats

The extent and species composition of the habitats on site were similar to the findings of the Extended Phase 1 Habitat Survey undertaken in November 2010. The following changes in habitats were identified, and are included on the Phase 1 habitat map in Appendix 2:

- As during the May 2013 verification survey, one noticeable change was that the density of gorse scrub had altered in the intervening period, with a significant increase in the density of scrub to the east of the quarry. Although this is now mapped as dense scrub on the Phase 1 habitat map, it should be noted that swathes of acid grassland are still present in this area, as well as smaller patches/paths amongst the gorse bushes.

- As expected in an active quarry, the profile of the quarry had changed, with new areas of cliff being exposed in the south eastern corner and additional spoil to the west (see Plate 1 in Appendix 1).
- Areas of undisturbed spoil, particularly on the western edge of the quarry is in the very early stages of developing into grassland as it is being colonized by plant species such as fescues, meadow grass sp and heath bedstraw, as well as very young scattered gorse plants.

It should be noted that the habitat to the north of the quarry, which will be lost when the quarry is extended, is largely unchanged and remains as a mosaic of bracken and acid grassland, with scattered scrub (see Plate 2).

2.2 Protected species

The table below provides a summary of any signs of protected species found during the October 2014 verification survey, as well as any changes in potential for protected species to be present.

Table 1. Signs of and potential for protected species at Yennadon Quarry

Species	Notes
Bats	The buildings on site are still considered to offer no/negligible potential for bats, as does the cliff/quarry face. As before, the hedgerow to the west is still considered to be the feature with most potential for foraging/commuting bats. Bats may forage over other scrub and grassland habitats on site, but this habitat is unlikely to be of high importance for foraging bats, especially given the exposed location of the site. It is anticipated that updated bat activity surveys would reveal a similar low level of bat activity as was detected in 2011.
Dormice	As before, the hedgerow to the west of the site offers potential habitat for dormice, but this will not be impacted by the proposals. Other scrub habitats on site have poor connectivity to other suitable dormouse habitat and therefore dormice are not anticipated to be present in these areas.
Reptiles	Habitat with potential to support reptiles is still present around the periphery of the quarry and in the wider area. It is likely that a small population of common lizards is still present, with potential for other reptiles (e.g. adder) to be present as well. As previously recommended, a reptile translocation will therefore be required for each phase of the quarry extension.
Badgers	In correlation with the 2010/2011 and 2013 surveys, badger setts were found within the hedge bank to the west of the quarry, and at least one sett (with two entrances) showed signs of current use by badgers. Please see target notes associated with the map in Appendix 1 for further details. However, as was previously concluded, the proposed quarry extension works will not damage these setts or cause disturbance to badgers significantly above what they experience at present. A specific search for badger setts was made in the area of the proposed quarry extension (and wider area) and although a few mammal burrows were noted there was no evidence of recent badger activity in this area (as was found previously). The majority of the burrows were in use by rabbits, as indicated by the presence of droppings and the small size of the entrance holes. One entrance, large enough to be used by badgers was found approximately 10m to the north of the quarry boundary fence; however vegetation was growing across the entrance suggesting no recent activity/use. The increase in gorse density to the east of the site may have increased the likelihood of badgers creating setts in this area due to the additional cover; however no new setts were identified.

Species	Notes
Nesting birds	Habitat with potential to support nesting birds, including ground nesting species is still present and therefore vegetation clearance will need to be undertaken when birds are not nesting, as previously recommended. It is anticipated that the bird assemblage is likely to be similar to that noted during the breeding bird surveys undertaken in 2011, although distribution across the site may have changed due to the changes in gorse density to the east of the quarry. No evidence of nesting peregrine falcons was noted on the cliff face.
Invertebrates	As the habitat types on site are largely similar to those found in 2010/2011 it is anticipated that the potential for invertebrates (and specifically butterflies) is similar.
Other protected species	No signs of, or significant potential for other protected species was identified.

3. Recommendations

Although there have been some changes to habitats surrounding the quarry since the original surveys were undertaken in 2010/2011, **overall the potential for protected species within the survey area remains unchanged**. **Therefore, it is anticipated that if Phase 2 surveys were redone, the results would be similar.**

On this basis, repeating the Phase 2 surveys at this stage is unlikely to provide much further information and **it is anticipated that the recommendations made in the 2010/2011 reports and the Biodiversity Mitigation and Enhancement Strategy (dated August 2013) will still be applicable.** However as the data is now 3 years out of date this will be up to the discretion of your planning officer, and also if works are not commenced within the next 12 months a further review will be required.

Please also note that where the 2010/2011 reports refer to Planning Policy Statement 9, this has been superseded by relevant sections of the National Planning Policy Framework (see Appendix 3 for details).

If you or your planning officer has any queries regarding this letter, please do not hesitate to contact me.

Yours sincerely,

Sarah Candlin BSc (Hons) MCIEEM
Senior Ecologist/Training Manager

Enc.

Appendix 1: Photos showing similar view of proposed quarry extension in 2010 and 2014

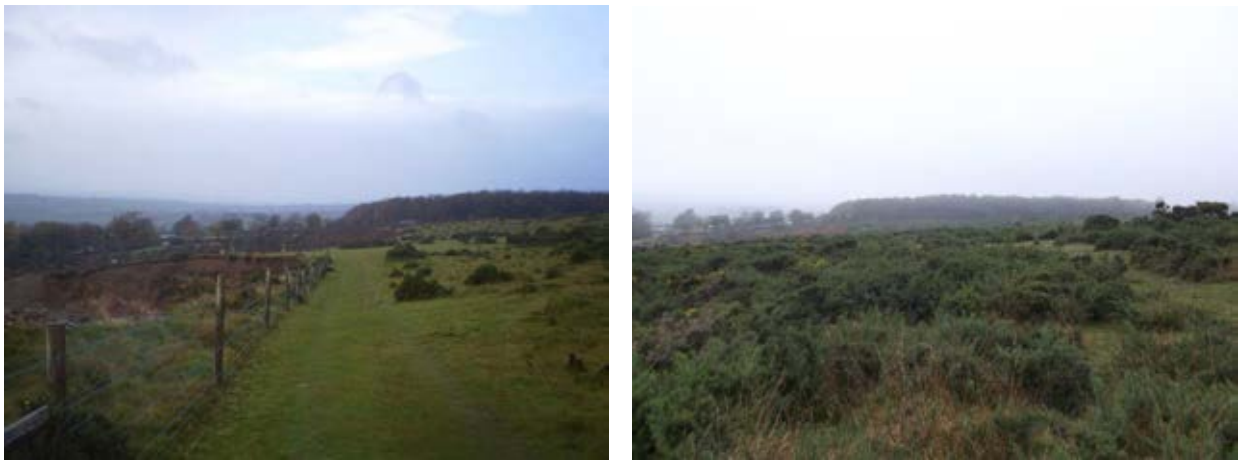

Plate 1. Photo of a similar (but not identical) view, showing how gorse cover has increased to the east of the quarry between 2010 (left) and 2014 (right) surveys.

Plate 2. Photo of a similar view looking north from quarry, showing that the habitat within the proposed quarry extension area was similar in 2010 (left) and 2014 (right).

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Appendix 2. Phase 1 habitat map from October 2014 survey

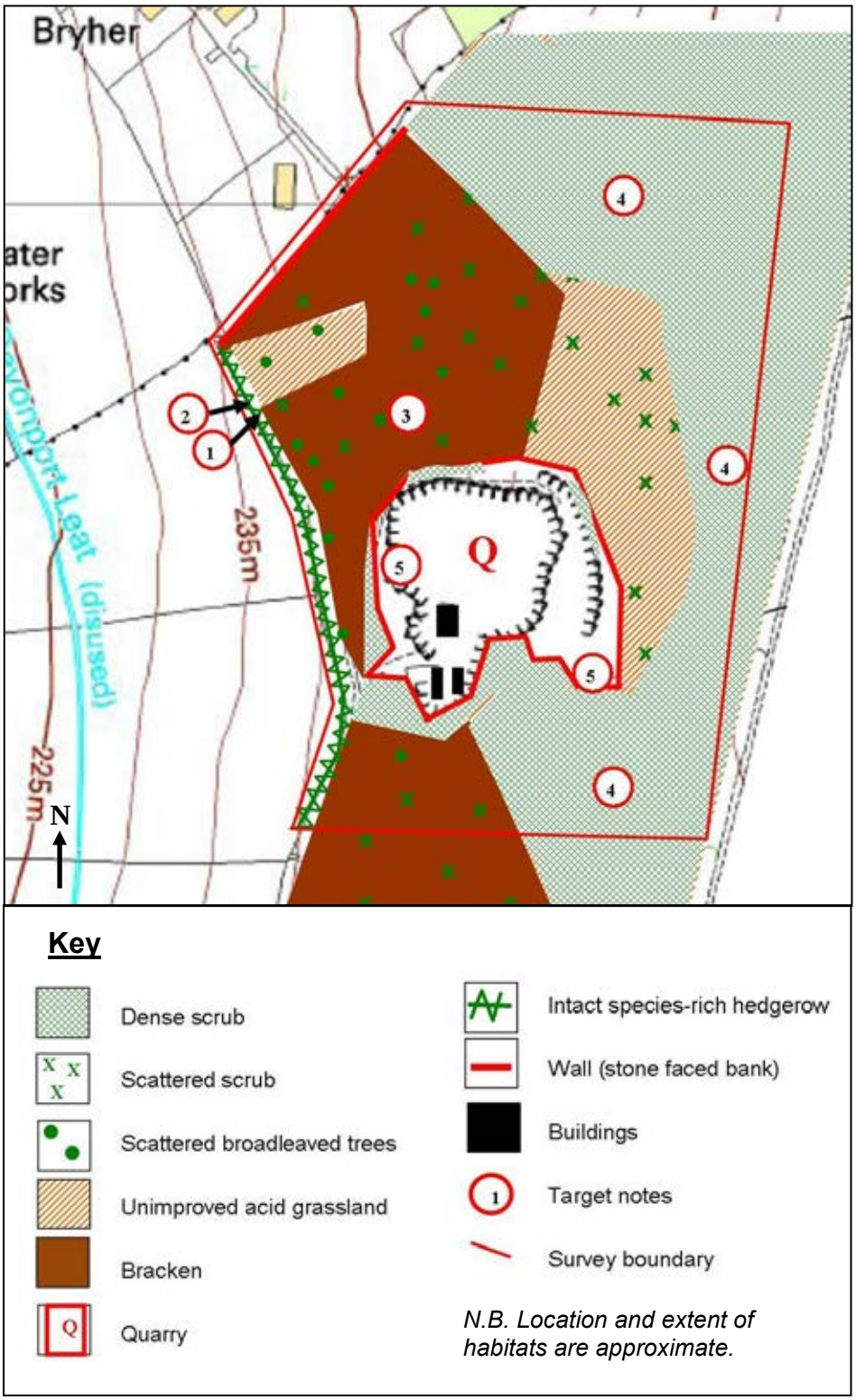

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Table 2. Target notes to accompany 2014 Phase 1 habitat map. *Please note that the target notes largely relate to changes since 2010/2011 surveys and the original survey reports should be referred to for further details.*

TN	Notes
1	Badger sett with two entrances, showing signs of recent activity as the entrances were clear and a badger guard hair was found in the spoil (also labeled as '1' in the Badger Survey Report dated November 2011).
2	Mammal burrow with two entrances which appear to be in current use by badgers and/or rabbits as the entrances were clear of vegetation. No conclusive signs of badger were noted (e.g. faeces, hairs or pad marks), but rabbit droppings were found outside the smaller of the two entrances. (Labeled as '2' in the Badger Survey Report dated November 2011).
3	Mammal burrow which is large enough for a badger to enter but was overgrown with vegetation and therefore considered to not be in current use (as per the Badger Survey Report dated November 2011)
4	The density of European gorse in these areas has increased significantly since the 2010 survey (it looked like the gorse had been relatively recently burnt when the 2010 survey was undertaken). However, there are still 'paths' and larger swathes of acid grassland amongst the gorse bushes.
5	Undisturbed spoil heaps around the quarry are gradually becoming colonised by grasses and scattered gorse. Overtime it is anticipated that this will develop into acid grassland and/or scrub habitats.

Appendix 3 – National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published on the 27th March 2012. This policy framework replaced many of the former Planning Policy Statements including Planning Policy Statement 9: Biodiversity and Geological Conservation (PPS9).

The NPPF contains reduced content with regards specific advice for biological conservation compared to that set out in PPS9. However much content is comparable with regards the needs for maintaining and enhancing biodiversity within planning policies and decisions. Specific sections of particular relevance include:

Paragraph 165: *"Planning policies and decisions should be based on up-to-date information about the natural environment".*

Paragraph 118: *"When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:"* including…

- *"if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts). adequately mitigated , or, as a last resort, compensated for, then planning permission should be refused;"*

- *"proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest feature is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;"*

- *"development proposals where the primary objective is to conserve or enhance biodiversity should be permitted"*

- *"Opportunities to incorporate biodiversity in and around developments should be encouraged;"*

- *"planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss;"*

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Andrea Robertson
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Leonards Road
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16 May 2013

Dear Andrea,

Ecological survey at Yennadon Quarry

Thank you for contacting us with regard the ecological survey work that has previously been undertaken at Yennadon Quarry. As you know the following surveys were undertaken by Acorn Ecology Ltd during 2010 and 2011, and this data was used to compile the Ecology Chapter for the Environmental Impact Assessment.

- Extended Phase 1 Habitat Survey: 9th November 2010
- Reptile Survey: April – July 2011
- Breeding Bird Survey: April – June 2011
- Bat Activity Surveys: June and July 2011
- Butterfly Surveys: April – August 2011
- Badger Sett Monitoring: November 2010, April 2011 and August 2011

As most of these surveys were conducted ~2 years ago, it was considered appropriate to conduct a verification survey to ensure that there were no significant changes in the vegetation/habitats on site and that there were no new signs of protected species (e.g. new badger setts).

Methodology

The verification survey was undertaken by myself (Sarah Candlin) on 2nd May 2013. The weather conditions during the survey were 14°C, wind force 1-2, 40% cloud and sunny intervals.

The visit involved conducting a walkover survey of the site and making note of any changes in habitat compared to the survey report dated 9th November 2010. The potential for protected species to be using the site was re-assessed and a specific search for active badger setts in the area of the proposed extension was undertaken.

Results and Recommendations

The extent and species composition of the habitats on site were similar to the findings of the Extended Phase 1 Habitat Survey undertaken in November 2010. The one noticeable change was that the density of scattered gorse scrub had altered in the intervening period, for example there was an increase in the density of scattered scrub to the south east of the quarry.

This slight change in habitat is not anticipated to have significantly increased or decreased the likelihood of protected species being present on site. It is therefore anticipated that the findings of the Phase 2 surveys undertaken in 2011 will still be valid and that the recommendations for mitigation and enhancement are still appropriate.

A specific search for badger setts was made in the area of the proposed extension and although a few mammal burrows were noted there was no evidence of recent badger activity in this area (as was found previously).

In correlation with the 2010/2011 surveys, active badger setts were found within the hedge bank to the west of the quarry (referred to as target notes 1 and 2 in the Badger Survey Report). It appeared that some further excavations had been undertaken in the intervening period as another entrance was present at sett 2 and a pile of spoil (may be the start of sett creation) had been created approximately 10-15m to the north of sett 2. However, as was previously concluded the proposed quarry extension works will not damage these setts or cause disturbance to badgers significantly above what they experience at present.

Overall, it is considered that the existing reports are still valid and there is no need to update the species specific surveys at this time. However, it should be noted that if works are not commenced within the next 12 months a further review will be required. Please also note that where the reports refer to Planning Policy Statement 9, this has been superseded by relevant sections of the National Planning Policy Framework (see Appendix 2 for details).

If you or your planning officer has any queries regarding this letter, please do not hesitate to contact me.

Yours sincerely,

Sarah Candlin BSc (Hons), MCIEEM
Ecologist/Training Manager

Appendix 1: Photo showing similar view of proposed quarry extension in 2010 and 2013

November 2010

May 2013

Appendix 2 – National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published on (and applies from) the 27th March 2012. This policy framework replaces many of the existing Planning Policy Statements including Planning Policy Statement 9: Biodiversity and Geological Conservation (PPS9).

The new NPPF contains reduced content with regards specific advice for biological conservation compared to that set out in PPS9. However much content is comparable with regards the needs for maintaining and enhancing biodiversity within planning policies and decisions. Specific sections of particular relevance include:

Paragraph 165: *"Planning policies and decisions should be based on up-to-date information about the natural environment".*

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- *"Opportunities to incorporate biodiversity in and around developments should be encouraged;"*

- *"planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss;"*

Ecological Survey Report

Site: Yennadon Stone Quarry

Client: Yennadon Stone Ltd.

Date of Survey: 9th November 2010

Prepared by Adam Bratt BSc (Hons), AIEEM
NE Bat Licence No: 20103604 NE Dormouse Licence No: 20104283
Sue Searle BSc (Hons),
PGDip (Ecology), MIEEM
NE Bat Licence No: 20103037 NE Dormouse Licence No: 20102944

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1. Introduction

This ecological survey was commissioned by Yennadon Stone Quarry Ltd. and a walkover survey was carried out on the 9th November 2010 by Adam Bratt BSc (Hons), AIEEM of Acorn Ecology Ltd. The purpose of the survey was to assess the conservation value of the survey area, the likely presence of rare or protected species, to identify any features, habitats or species which would constitute potential constraints to any development which might take place, and to make recommendations for mitigation and/or further survey work, as appropriate.

1.1 Site Location

The site is located on the edge of Yennadon Down on the southwestern side of Dartmoor National Park (Grid reference SX 542 687) at a height of approximately 250m above sea level. The village of Dousland is situated less than 500m to the west and Burrator Reservoir is located approximately 1km to the east. The immediate surroundings consist of open moorland with enclosed fields of pasture within 100m to the west. An area of sessile oak and beech woodland is located approximately 270m to the north.

1.2 Site description

Yennadon Stone Quarry is an active stone quarry measuring approximately 1.5Ha in area. It is accessed by a single track lane from the south. The following habitats were identified during the survey of the quarry and the surroundings:

Scrub
The majority of scrub on site consists of gorse (*Ulex europaeus*) occurring in various densities throughout the site. Density is highest in the immediate surroundings of the quarry, with scattered gorse occurring throughout areas of dense bracken (*Pteridium aquilinum*) and acid grassland. Scrub consisting of bramble (*Rubus fructicosus*), blackthorn (*Prunus spinosa*) and small amounts of buddleia (*Buddleia sp.*) is also present near to the active quarry area.

Scattered trees
Scattered trees including sessile oak (*Quercus petraea*) and hawthorn (*Crataegus monogyna*) are present in areas of dense bracken. Several small planted specimens including ash (*Fraxinus excelsior*), silver birch (*Betula pendula*) and beech (*Fagus sylvatica*) are present amongst dense scrub immediately to the west of the quarry.

Bracken
Dense bracken is present both to the north and south of the quarry. The bracken occurs over acid grassland. Ground vegetation consists of very short grazed acid grassland including common bent (*Agrostis capillaris*), common sorrel (*Rumex acetosa*), sheep's sorrel (*Rumex acetosella*), heath bedstraw (*Galium saxatile*), tormentil (*Potentilla erecta*), common mouse ear (*Cerastium fontanum*), violet (*Viola sp*.) and foxglove (*Digitalis purpurea*). Scattered gorse and hawthorn trees are present in this area.

Acid grassland
Unimproved acid grassland is present over a large area to the north, south and east of the quarry. The grassland is grazed short by ponies (present at time of survey) and probably rabbits and sheep too. Plant species present include tormentil, heath bedstraw and sheep's sorrel present. Grasses and sedges including common bent, wavy hair grass (*Deschampsia flexuosa*), fescues (*Festuca* spp.), meadow grasses (*Poa* spp.) and wood rush (*Luzula sp*.) were also noted. Very small amounts of bell heather (*Erica cinerea*) were noted to the north of the proposed new quarry extension.

Quarry
The quarry is an active slate quarry consisting of areas of spoil and active quarry face. The main quarry face at the northern end of the quarry comprises of near-vertical rock face extending approximately 50m in height.

Hedgerow
A species rich intact hedgerow on top of a bank is present at the western end of the survey area. This marks the boundary between enclosed pasture to the west and open moorland to the east. Woody species present include sessile oak, hazel (*Corylus avellana*), alder (*Alnus glutinosa*), blackthorn, holly (*Ilex aquifolium*), elder (*Sambucus nigra*) and gorse. Other plant species include foxglove, bilberry (*Vaccinium myrtillus*) and ferns (*Dryopteris sp*.). The hedgerow meets the criteria of an ‗important hedgerow' under the Hedgerows Regulations (1997).

Buildings
An open-fronted wooden building used as a stone cutting shed is present within the quarry. Offices in Portakabin/metal containers are present at the southern end of the quarry.

See photos in Appendix 1 and Phase 1 habitat map in Appendix 2.

1.3 Proposed Development

It is proposed that the existing quarry will be extended to the north as shown in Drawing No. FIG2 Rev. P1 and Drawing No.FIG3 Rev. P2 produced by John Grimes Partnership Ltd. The extended area measures approximately 0.75Ha in size.

2. Survey Methods

2.1 Walkover survey

An extended Phase 1 habitat survey was undertaken in accordance with the JNCC (1990) in order to produce a Phase 1 habitat map, with target notes identifying the potential for any protected or notable species.

2.2 Data search

A data search was undertaken by Devon Biodiversity Records Centre (DBRC) in November 2010. The data search identified records of statutory and non-statutory sites as well as legally protected and notable species records within 2km of Yennadon Quarry. An additional search for bat species within 4km of the site was also undertaken. A search on the National Biodiversity Network www.nbn.org.uk for records of high brown fritillary (*Argynnis adippe*) was also undertaken.

A Phase 1 habitat survey report for the site produced by *Rural Arisings* (August 2006) was also referred to during the study.

3. Survey Results

3.1 Walkover survey results (species)

3.1.1 Bats

No signs of bats were noted during the survey. The buildings on site offered no/negligible potential to be used by bat species as a roost site due to the unsuitability of the structures themselves (sealed Portakabins and metal containers or open fronted wooden structures with unlined sheet roofing) and high levels of noise and dust disturbance present. The exposed active quarry faces appear to have relatively limited potential to be used by bat species for roosting due to the relatively smooth faces with an apparent lack of fissures and cracks which could offer potential roost sites.

The site has potential to be used by bats species for foraging and commuting. The length of intact species rich hedgerow is a feature which is most likely to be used by bats. It is also possible that some bat species may use the open grassland, scrub and areas of bracken to the north of the quarry for foraging.

The data search shows records of four bat species within 4km of the survey site including common pipistrelle (*Pipistrellus pipistrellus*), brown long-eared (*Plecotus auritus*), lesser horseshoe (*Rhinolophus hipposideros*) and noctule (*Nyctalus noctula*).

3.1.2 Dormice

No signs of dormice (*Muscardinus avellanarius*) were noted during the survey. Dormice frequently use areas of woodland, hedgerow and dense scrub in Devon. The species rich hedgerow to the west of the quarry has potential to support dormice. The data search shows a record of dormouse within Dousland in 2001 (approximately 600m to the west of the site).

3.1.3 Great crested newts

No signs of great crested newt (*Triturus cristatus*) were noted during the survey. There is no regular water body on site which could support this species. Great crested newts are not known to be present in this part of Devon.

3.1.4 Reptiles

Habitat with the potential to support reptiles exists within the survey site. Areas of ungrazed grass and gorse scrub immediately surrounding the quarry and extensive areas of bracken could potentially support reptiles such as slow worm (*Anguis fragilis*), common lizard (*Zootoca vivipara*) and adder (*Vipera berus*).

3.1.5 Badgers

A badger (*Meles meles*) sett was identified within the bank of the hedgerow bordering the western edge of the survey site. The sett comprised of two entrances with spoil heaps. A dung pit with faeces was present beside one of the sett entrances indicating that the sett was in current use. Further single mammal burrows which had the potential to have been created by/used by a badger were also noted on site. These entrances did not display any signs of being in current use by badgers.

3.1.6 Nesting birds

Scrub and scattered trees on site have the potential to be used by nesting birds. Areas of unenclosed acid grassland and gorse scrub on the edge of Dartmoor often support birds such as wheatear (*Oenanthe oenanthe*), meadow pipit (*Anthus pratensis*) and stonechat (*Saxicola torquata*).

Several quarry sites in the southwest are known to be used by peregrine falcon (*Falco peregrinus*) for nesting. The quarry faces appeared unsuitable for nesting by this species due to a lack of obvious ledges. Staff at the quarry had not seen peregrine on site.

3.1.7 Invertebrates

The data search includes 13 Biodiversity Action Plan (UKBAP) priority moth species and 4 UKBAP butterfly species. In addition to those species listed on the data search, the Phase 1 habitat survey undertaken by *Rural Arisings* in 2006 highlighted the potential for high brown fritillary (*Argynnis adippe*). Records of high brown fritillary in the local area are present on www.nbn.org.uk. Several of the species listed on the DBRC data search could use the habitat present within the proposed quarry extension.

3.2 Survey constraints

The survey was carried out at a time of year when breeding birds were not present and many plant species not conspicuous. However the survey did identify the habitats present and the potential for protected species.

3.3 Data search results

Sites

The site does not fall within a site designated for nature conservation. Within 2km of the site there is 1 Site of Special Scientific Interest (SSSI), 4 County Wildlife Sites (CWS) and 2 Unconfirmed Wildlife Sites. The closest designated site is Burrator Quarries SSSI located approximately 1.2km to the southeast. The site is designated as a geological SSSI for its *"Rare exposures of Permo-Carboniferous Dartmoor granite and Devonian country rocks of the Kate Brook Formation".* Other sites within 2km include semi-natural ancient woodland, acid flush and unimproved and semi-improved acid grassland.

Species

In total there are 53 records of legally protected or notable plant and animal species for the search area. Protected and notable species include common lizard, badger, dormouse and butterfly and moth species. The additional search for bats (within 4km of the site) included results for common pipistrelle, brown long-eared, lesser horseshoe and noctule. None of these records are within the survey area but that is potentially due to lack of survey effort or non-submission of records.

For the full data search results see Appendix 3.

4. Evaluation

Please note that all conclusions and recommendations are based upon the current survey findings and on the proposal outlined in 1.3 above. If the site changes then the potential for protected species to use the site may change accordingly.

4.1 Conclusions (Habitats)

4.2.1 Acid grassland

Unenclosed, unimproved acid grassland comprises the majority of the habitat surrounding the quarry (including the proposed quarry extension). Significant areas of dense bracken and scattered gorse are also present in these areas. The grassland is grazed short by ponies (and probably sheep and rabbits too). The close grazed nature of the grassland and time of year when the survey was undertaken made compiling a full vegetative list challenging. However the grassland appears typical of this type of habitat in the region. It is possible that this area was once more typical of upland heath (due to the presence of very small amounts of heather).

The areas of acid grassland, bracken and scrub mosaic surrounding the quarry have potential to support a range of fauna including reptile species, breeding birds and invertebrates.

4.2.2 Quarry

Yennadon Quarry is an active slate quarry which has some limited potential to be used by bat species for roosting and peripheral grassland has potential to be used by reptile species. The geological features of the quarry were not assessed.

4.2.3 Hedgerow

The intact species-rich hedgerow to the west of the quarry meets the criteria of an ‗important hedgerow' under the Hedgerow Regulations (1997) due to the number of woody species present. This hedgerow has an active badger sett present and potential to support other protected species such as dormice and nesting birds. Bat species are also likely to use the hedgerow for commuting and foraging. This hedgerow will be retained under the proposals.

4.2 Conclusions (Species)

4.2.4 Bats

No signs of bats were noted. The northern face of the quarry has relatively low potential to be used for roosting by bats (with few obvious suitable cracks, fissures or crevices identified). No buildings or trees will be affected as part of the proposed quarry extension. The loss of approximately 0.75Ha of acid grassland, gorse scrub and bracken is anticipated to have a negligible effect on bat foraging habitat in the area.

Although the quarry has relatively low potential to be used by bat species for roosting, many quarry sites do support bat roosts and bats may roost in unseen cracks and crevices in the rock face. It is therefore advisable that surveys are conducted to determine presence or likely absence of a roost site in the northern quarry face (in accordance with guidelines given by the Bat Conservation Trust Bat (2007) and referred to by Natural England. **It is recommended that two activity surveys are undertaken during the period (May to end of August).**

All bat species in Britain are European Protected Species and if a roost is identified on site then a European Protected Species licence (EPSL) will be required from Natural England if an activity likely to result in an offence were proposed (see section 4.3 for more details). In order for a licence to be granted, planning permission will be required and you will need to demonstrate that the proposed activity meets the criteria set out in Regulations 53 (2) (e), 53 (9) (a) and 53 (9) (b). Please read section 4.2 in detail to ensure that your project would meet these criteria.

4.2.5 Dormice

No signs of dormice were noted. There is potential for dormice to be present within the intact species-rich hedgerow along the western boundary of the survey area. It is extremely unlikely that dormice would be present in scattered gorse across the proposed location of the quarry extension due the exposed location and poor connectivity with more suitable habitat. **Providing that the hedgerow is retained then no further survey for this species is recommended.**

4.2.6 Great crested newts

No signs of great crested newts were noted. No suitable habitat is present and this species is not known to occur in this part of Devon. **No further survey for this species is recommended**.

4.2.7 Reptiles

There is potential for reptiles to be present in ungrazed grass immediately surrounding the quarry and on the area of unenclosed grassland and bracken to the north. Reptile species such as slow worms and common lizards are protected from being killed and injured (See Section 4.3 for more details). Proposals to clear vegetation prior to quarrying could potentially kill or injure reptiles. **A reptile survey is recommended** to determine if reptiles are present and their distribution throughout the proposed quarry extension. Reptile surveys involve placing reptile refugia (bitumen roofing felt tiles) in suitable habitat and leaving for a period of one week. They are then surveyed on seven occasions for reptile presence. Reptile surveys can only take place when reptiles are active and during suitable weather conditions. The optimal season for reptile surveys is generally between April and end of September (although the optimal period for surveying sites of reasonably high elevation are often reduced due to cooler average temperatures).

If reptiles are present then a strategy to protect them will be required. This would potentially consist of installing reptile barrier fencing around the proposed area of quarrying works and relocating any reptiles from that habitat. The relocation process can sometimes take several weeks for large populations. When numbers of reptiles encountered are consistently low, a destructive search of any remaining habitat is often required. This involves an ecologist being present whilst a mechanical digger scrapes the vegetative layer. Any remaining reptiles identified can then be relocated to suitable habitat nearby.

4.2.8 Badgers

A badger sett displaying signs of current use by badgers was noted in the bank of the hedgerow to the west of the proposed new quarry extension. A further two mammal burrows (potentially used by badgers in the past) were noted either in or very close to the area of proposed new quarrying works. Neither of these burrows was displaying signs of current use by badgers. It is likely that badgers will pass through the proposed new quarry extension.

Badgers are protected under the Badgers Act (1992) from disturbance and setts are protected from being damaged or destroyed (see Section 4.3 for more details). Guidance from Natural England defines a sett as showing signs of ‗current use' by badgers. Disturbance must include activities above which that group of badgers are used to experiencing.

It is proposed that quarrying works will take place to within approximately 90m of the sett within the hedge bank. It is not anticipated that this will damage that sett or disturb badgers (the boundary of the existing quarry is currently the same distance away).

However as there are mammal burrows which may have been used by badgers in the past (and could do again) **it is recommended that a survey of badgers takes place prior to works being started**. If a sett showing signs of current use is present (and would either be damaged or badgers using it

disturbed) then a licence will be required from Natural England. Licences will usually only be granted to works during the period 1st July to the 30th November in any year to avoid the potential of harming dependant juveniles.

As an active sett is present in the vicinity of the proposed new quarry extension a strategy to limit harm or disturbance to badgers should be adhered to. A strategy should include fencing the proposed new quarry area to prevent badgers accessing the site prior to digging works commencing.

4.2.9 Nesting birds

The gorse scrub within the proposed new quarry extension has potential to be used by nesting birds, including bird species which may be of conservation concern (Eaton et al. 2009). **In order to determine the bird species using the area of the proposed quarry extension and therefore the likely impacts of the new quarrying activities on birds, it is recommended that a breeding bird survey is undertaken. Breeding bird surveys involve survey visits in April, May and June to record and map the bird species present.**

Under the Wildlife and Countryside Act 1981 it is illegal to take, damage or destroy the nests of wild birds whilst being built or in use. Some species listed on Schedule 1 of the Wildlife and Countryside Act (1981) as amended are also protected from disturbance whilst nesting and rearing dependant juveniles. However, it is not an offence to carry out work in areas that they use, outside of the nesting period. **Therefore it is recommended that works to remove vegetation with potential to be used by nesting birds are carried out during the period between end of September and end of February to avoid the breeding season**.

If works to remove stands of gorse need to be carried out during the nesting season (March to September) a check should be made by an ecologist for nesting birds, the day before the works are due to commence. Any birds nesting should be left to complete their breeding (i.e. until the young have fully fledged) before carrying out vegetation removal.

4.2.10 Invertebrates

The proposed quarry extension has potential to provide habitat to a number of moth and butterfly species. In particular the potential for high brown fritillary has been noted in the previous phase 1 habitat survey conducted by *Rural Arisings* (2006). During this survey potential larval food plants of this species (violets) were noted in small numbers in the area of bracken to the north of the existing quarry. **A survey for high brown fritillary and other butterfly species, as in indicator of invertebrate life, should be carried out in the summer months** in order to give an indication of insect diversity.

High brown fritillary butterflies are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (see section 4.3 for more details). Other butterfly species which could potentially use the area of acid grassland and bracken are also UK Biodiversity Action Plan (UKBAP) priority species due to their recorded declines within the last 25 years. Efforts to reduce the loss of habitats used by invertebrates and undertake efforts to enhance or restore habitat nearby will reduce the impacts of the development on invertebrate species.

4.2.11 Avoidance, mitigation and enhancement

Planning Policy Statement 9 (PPS9) states that **planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests.** A scheme of mitigation and enhancement will be most appropriately created after specific species surveys have been undertaken. The following are some suggestions which could be undertaken to reduce impacts on biodiversity and ensure long term ecological enhancements as a result of the development.

- Encourage establishment of locally typical acid grassland in areas of redundant spoil from previous quarrying activities on site. This could include seeding areas of bare earth with a suitable grassland mixture.
- Consider translocation of turf from areas of proposed new quarrying activities to suitable receptor sites nearby (possibly areas of disturbed ground, former areas of quarrying or agriculturally improved grasslands).
- Remove any buddleia to prevent it from spreading and affecting native, locally typical vegetation.
- Erect bat boxes and bird nest boxes in larger trees to benefit bat and bird species.

Summary of further survey work required

Survey type	Timing	Notes
Bat activity	May-end of August	Two surveys. Aim to determine whether a bat roosting location is present which could be affected by proposals.
Reptile	April/May-September	7 survey visits
Breeding Birds	April, May and June	3 survey visits
Butterfly survey	June, July and August	3 survey visits
Badger survey	Prior to works (to be discussed)	1 survey visit to determine current use of setts

4.3 Wildlife and the Law

European Protected Species

Background to the legislation:
The Bern Convention (The Convention on the conservation of European Wildlife and Natural Habitats) was adopted in 1979 and came into force in 1982. To implement this agreement, the European Community adopted the EC Habitats Directive.

The EC habitats directive has been transposed into UK legislation by the Wildlife and Countryside Act, 1981 (as amended) and the Conservation of Habitats and Species Regulations, 2010. The Countryside and Rights of Way Act (CRoW), 2000 strengthened the existing wildlife legislation in the UK.

The UK has also signed The Bonn Convention (The Convention on the Conservation of Migratory Species of Wild Animals) and is therefore party to various agreements.

Bats: All 17 species of bats are protected under Schedules 5 and 6 of the Wildlife and Countryside Act 1981(and as amended) and are also protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2010. They are listed under Appendix III of the Bern Convention and Annex IV of the EC Habitats Directive. Bats and their habitats are also listed under Appendix II of The Bonn Convention and therefore the UK has an obligation to protect their habitat, including links to important feeding areas.

Common Dormouse: Dormice are classified as Lower Risk-near threatened by the IUCN (International Union for the Conservation of Nature and Natural Resources) Red List and Vulnerable in the UK. They are listed under Appendix III of the Bern Convention and Annex IV of the European Habitats & Species Directive. In the UK they are protected under Schedule 5 of the Wildlife and Countryside Act, 1981 (and as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2010.

Legislation relating to the European Protected Species mentioned above:

In relation to a development a person commits an offence if they—

- Deliberately captures, injures or kills a European Protected Species
- Deliberately or recklessly disturbs wild animals of any such species in such a way as to be likely significantly to affect:
  (i) the ability of any significant group of animals to survive, breed, or rear or nurture their young; or
  (ii) the local distribution or abundance of that species;
- Damages or destroys a breeding site or resting place (even if unintentional or when the animal is not present)
- Intentionally or recklessly obstructs access to a structure or place used for protection or shelter

This legislation applies, regardless of the life stage (including eggs).

A European Protected Species Licence is required to carry out any activity that would otherwise involve committing an offence.

European Protected Species Licences
At the present time, Natural England require the following three ‗tests' to be met, in order that a licence may be granted:

Test 1. Regulation 53 (2) (e) states that ‗licences may be granted to ‗preserve public health, or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment'.

Test 2. Regulation 53 (9) (a) states that a licence may not be granted unless the licensing authority is satisfied ‗that there is no reasonable alternative'.

Test 3. Regulation 53 (9) (b) states that a licence cannot be issued unless the licensing authority is satisfied that the action proposed ‗will not be detrimental to the maintenance of the species concerned at a favourable conservation status in its natural range.

Other protected species:

Nesting Birds: All wild birds are protected under part 1 of the Wildlife and Countryside Act, 1981. Therefore, in the UK it is an offence to:

- Take, damage or destroy the nest of any wild bird whilst it is being built or in use.
- Kill, injure or take any wild bird
- Take or destroy the eggs of any wild bird

To avoid committing an offence no works should be carried out on a structure/ feature that is being used by nesting birds. Nesting is deemed to be over when the young have fully fledged.

Certain species which are listed in Schedule 1 of the Wildlife and Countryside Act receive special protection. In these cases any form of intentional or reckless disturbance when they are nesting or rearing dependant young, constitutes an offence.

Reptiles: Common lizard, slow worm, adder and grass snake are all protected under Schedule 5 of the Wildlife and Countryside Act, 1981 against intentional injuring, killing or selling.

For development sites in **England, Wales or Scotland,** to avoid prosecution under the ***Wildlife and Countryside Act 1981 (as amended)***, wherever works will impact on slow worms, common lizards, adders and/or grass snakes there must be evidence that every reasonable effort was made to avoid breaking the law – including proof of adequate surveys and mitigation plans. Mitigation measures should, ideally, be agreed with the relevant SNCO (in this case Natural England).

Only the sand lizard and smooth snake are fully protected under the Wildlife and Countryside Act, 1981 (Section 9) and Regulation 9 of the Conservation of Habitats and Species Regulations 2010 against killing, injuring, capture, damaging or destroying a breeding or resting site, intentionally obstructing access to a place used for shelter, keeping, transporting or selling. This means that not only are the animals themselves protected but so are their habitats. These species do not occur in Devon outside specific nature reserves.

Badger: Badgers are fully protected in the UK by the Protection of Badgers Act, 1992 and by Schedule 6 of the Wildlife and Countryside Act, 1981(as amended). This makes it an offence to:

- Willfully kill, injure, take, possess or cruelly treat a badger
- Intentionally or recklessly damage, destroy or obstruct access to a badger sett.
- Disturb a badger while it is occupying a sett. Disturbance could include digging or scrub clearance within 30m of the sett, and therefore advice should be sought before carrying out such activities.

Badgers are mainly protected due to persecution in the past and are not rare, especially in the South West.

Invertebrates: Several invertebrates are listed under Schedule 5 of the Wildlife and Countryside Act 1981 and are protected to varying degrees, from killing and injuring to being sold. The high brown fritillary receives full protection including protection from being killed or injured. Many invertebrates (including butterfly and moth species are also UK Biodiversity Action Plan (UKBAP) priority species. These species have undergone declines within the past 25 years and have plans in place to prevent further declines and improve their conservation status.

Hedgerows Regulations 1997: The Hedgerows Regulations 1997 were made under section 97 of the Environment Act 1995 and came into force on 1 June 1997. They introduced new arrangements for local planning authorities in England and Wales to protect important hedgerows in the countryside, by controlling their removal through a system of notification. The Regulations set out the criteria that must be used by the local planning authority in determining which hedgerows are important. The criteria relate to the value of hedgerows from an archaeological, historical, landscape, amenity or wildlife perspective. They exclude hedgerows that are less than 30 years old. If a hedgerow is at least 30 years old and qualifies under any one of the criteria, then it is important. See http://www.opsi.gov.uk/si/si1997/19971160.htm

Hedgerows and the Law

Legal Protection

In England and Wales hedgerows are protected under the ***Hedgerow Regulation 1997*** which require landowners and/ or tenants to submit a hedgerow removal notice to the LPA.

- For important hedgerows, LPA will issue a ~~h~~hedgerow retention notice", requiring the hedge to be preserved
- It is a criminal offence to remove a hedgerow without submitting a notice to the LPA and waiting for the decision. The regulations do not apply to hedges around private dwellings or where planning permission has been granted for a project that includes hedge removal.
- Individual trees (and Hedges) can be protected by Tree preservation Orders (TPOs)
- Hedgerows and individual trees can also be protected where they are within a SSSI, national nature reserve, local nature reserve or other protected area.
- Hedgerows may contain plants which are protected under the ***Wildlife and Countryside Act 1981***. it is an offence to intentionally pick, uproot or destroy these plants species without a licence.
- It is an offence to uproot any wild plant without the landowner's permission.
- A number of protected animal species are associated with hedgerows and trees. These include several bat species, which roost in cavities in trees, dormice, badger, reptiles such as adder, grass snake, slow worm and common lizard plus a wide range of nesting birds.

Planning Policy Statement 9: Planning Policy Statement 9 (PPS9) sets out national planning policies on the protection of biodiversity and geological conservation. Circular 06/05 (DEFRA 01/05): Biodiversity and Geological Conservation: Statutory Obligations and Their Impact within The Planning System provides administrative guidance on application of the law in England relating to planning and nature conservation. Para 98 states ‗The presence of protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. … They should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species … For European protected species further strict provisions apply … to which the planning authorities must have regard.'

Key principles of PPS9

Regional planning bodies and local planning authorities should adhere to the following key principles to ensure that the potential impacts of planning decisions on biodiversity and geological conservation are fully considered.

i. Development plan policies and planning decisions should be based upon up-to-date information about the environmental characteristics of their areas. These characteristics should include the relevant biodiversity and geological resources of the area. In reviewing environmental characteristics local authorities should assess the potential to sustain and enhance those resources.

ii. Plan policies and planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. In taking decisions, **local planning authorities should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; and to biodiversity and geological interests within the wider environment.**

iii. Plan policies on the form and location of development should take a strategic approach to the conservation, enhancement and restoration of biodiversity and

geology, and recognise the contributions that sites, areas and features, both individually and in combination, make to conserving these resources.

iv. **Plan policies should promote opportunities for the incorporation of beneficial biodiversity and geological features within the design of development.**

v. Development proposals where the principal objective is to **conserve or enhance biodiversity** and geological conservation interests should be permitted.

vi. The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests. Where granting planning permission would result in significant harm to those interests, local planning authorities will need to be satisfied that the development cannot reasonably be located on any alternative sites that would result in less or no harm. In the absence of any such alternatives, local planning authorities should ensure that, before planning permission is granted, adequate mitigation measures are put in place. Where a planning decision would result in significant harm to biodiversity and geological interests which cannot be prevented or adequately mitigated against, appropriate compensation measures should be sought. If that significant harm cannot be prevented, adequately mitigated against, or compensated for, then planning permission should be refused.

5. References

Bat Conservation Trust (2007) *Bat Surveys- Good Practice Guidelines.* Bat Conservation Trust, London.

Eaton MA, Brown AF, Noble DG, Musgrove AJ, Hearn R, Aebischer NJ, Gibbons DW, Evans A, and Gregory RD (2009) *Birds of Conservation Concern 3*: *The Population Status of Birds in the United Kingdom, Channel Islands and the Isle of Man.* British Birds 102, pp296-341

Herpetofauna Worker's Manual (2003) Joint Nature Conservation Committee
Great Crested Newt Conservation Handbook (2001) Froglife

Handbook for Phase 1 habitat survey (1990) Joint Nature Conservation Committee

Dormouse Conservation handbook (2006) Natural England

Yennadon Quarry Phase 1 habitat survey (2006) Rural Arisings.

6. Appendices

Appendix 1 - Photographs of the site.

Photo 1. Yennadon Quarry viewed in a southerly direction.

Photo 2. Showing areas of proposed new quarrying activity. Viewed in a northerly direction.

Photo 3. Showing area of proposed new quarrying activity. Viewed in a westerly direction.

Appendix 2 – Phase 1 habitat survey map showing features.

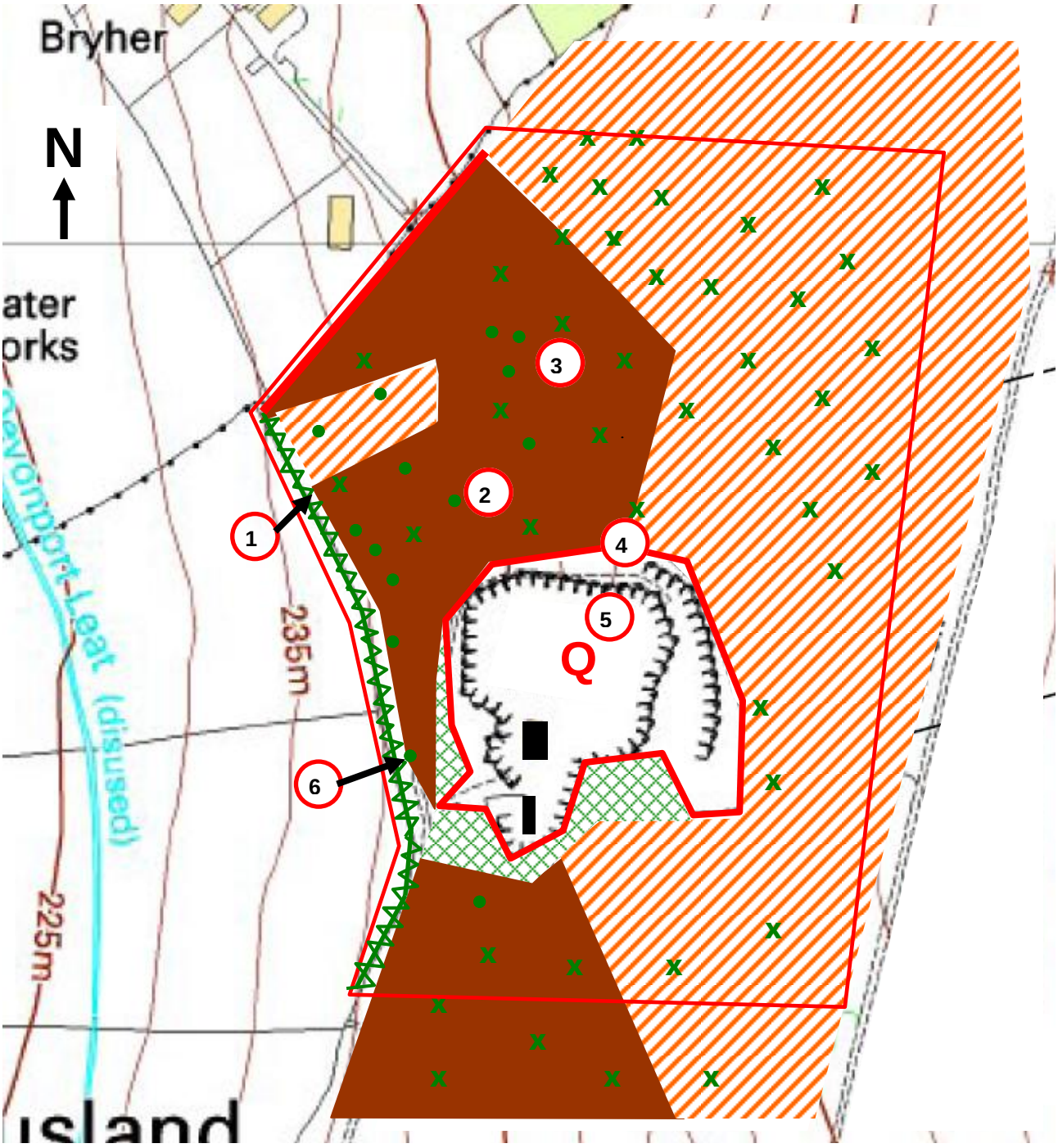


Figure 1. Phase 1 habitat map

Note: *Locations and extent of habitats are approximate. Scattered trees and scrub are indicative and locations not exact. Phase 1 habitat key and target notes on following pages.*

Phase 1 habitat survey key


Dense continuous scrub

Scattered scrub


Scattered broadleaved trees


Unimproved acid grassland


Bracken

Quarry


Intact species-rich hedgerow


Wall (stone faced bank)


Buildings

Target notes


Survey boundary

Target note descriptions

Target note number	Notes
1	Badger sett in base of hedge bank. Two entrances. Dung pit with faeces indicating in current use by badgers.
2	Approximate location of mammal burrow. Of a size large enough to have been created by badger. No signs of current use by badgers.
3	Approximate location of mammal burrow. Of a size large enough to have been created by badger. No signs of current use by badgers. On edge of dip in ground.
4	Edge of quarry. Grassland with potential to support reptiles. Especially ungrazed margin of quarry.
5	Active quarry. Northern face has relatively limited potential to be used by bats for roosting. However active quarries are used for roosting by bats and potential exists.
6	Mature sessile oak. Of conservation importance and should be retained.

Appendix 3 – Criteria for granting licences

Natural England will only issue a European Protected Species Licence if your project is deemed as satisfying the following 3 ‗tests'. When assessing your licence application, Natural England needs to see objective evidence to support any statements that are made in the licence application.

Test 1
Regulation 53 (2) (e) states that **'licences may be granted to 'preserve public health, or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment'.**

Examples of satisfactory purposes (not an exhaustive list):

- Structure is unstable and there is a report from a structural engineer or a tree surgeon to justify the claim.
- There is a high degree of need for affordable housing in an area already allocated for development in the Local Plan.

Test 2
Regulation 53 (9) (a) states that a licence may not be granted unless the licensing authority is satisfied **‗that there is no satisfactory alternative'**.

- The applicant needs to provide evidence to show that they have explored other alternatives and found them to be inadequate.

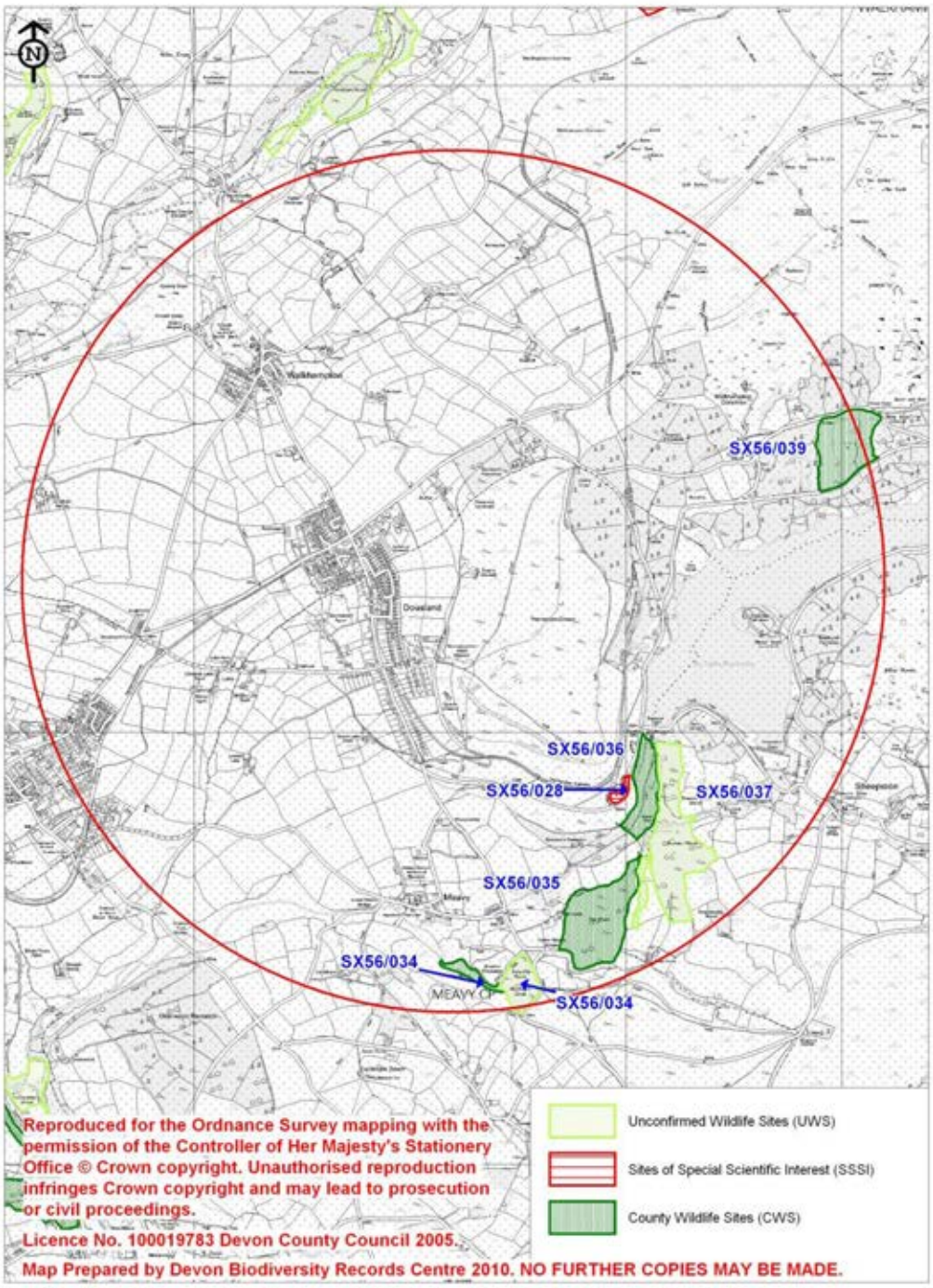
- The ‗do nothing' option must also be considered as a possible alternative, and if this is not a satisfactory option then evidence will be required to support this decision.

Test 3
Regulation 53 (9) (b) states that a licence cannot be issued unless the licensing authority is satisfied that the action proposed **‗will not be detrimental to the maintenance of the species concerned at a favourable conservation status in its natural range'**.

Natural England advises that there should be no net loss in the local population status of the species concerned and they base this decision on the information provided by your ecologist in the wildlife survey reports. Therefore it is important that your ecologist conducts sufficient survey work to find out which species are present, gain an estimate of likely numbers and to determine how the species are using the site (e.g. for breeding or hibernation).

It is possible that the conservation value of the site may be deemed to be too important to permit the development, for example if it is a breeding site for a rare species. However, in many cases this test can be satisfied by providing suitable mitigation that aims to maintain a population of equivalent status on or near the original site. Acorn Ecology can advise on appropriate mitigation measures.

Appendix 4 – Data search results



Statutory & non-statutory sites within 2 kilometres of SX 542687 (2010) Enq no. 5182

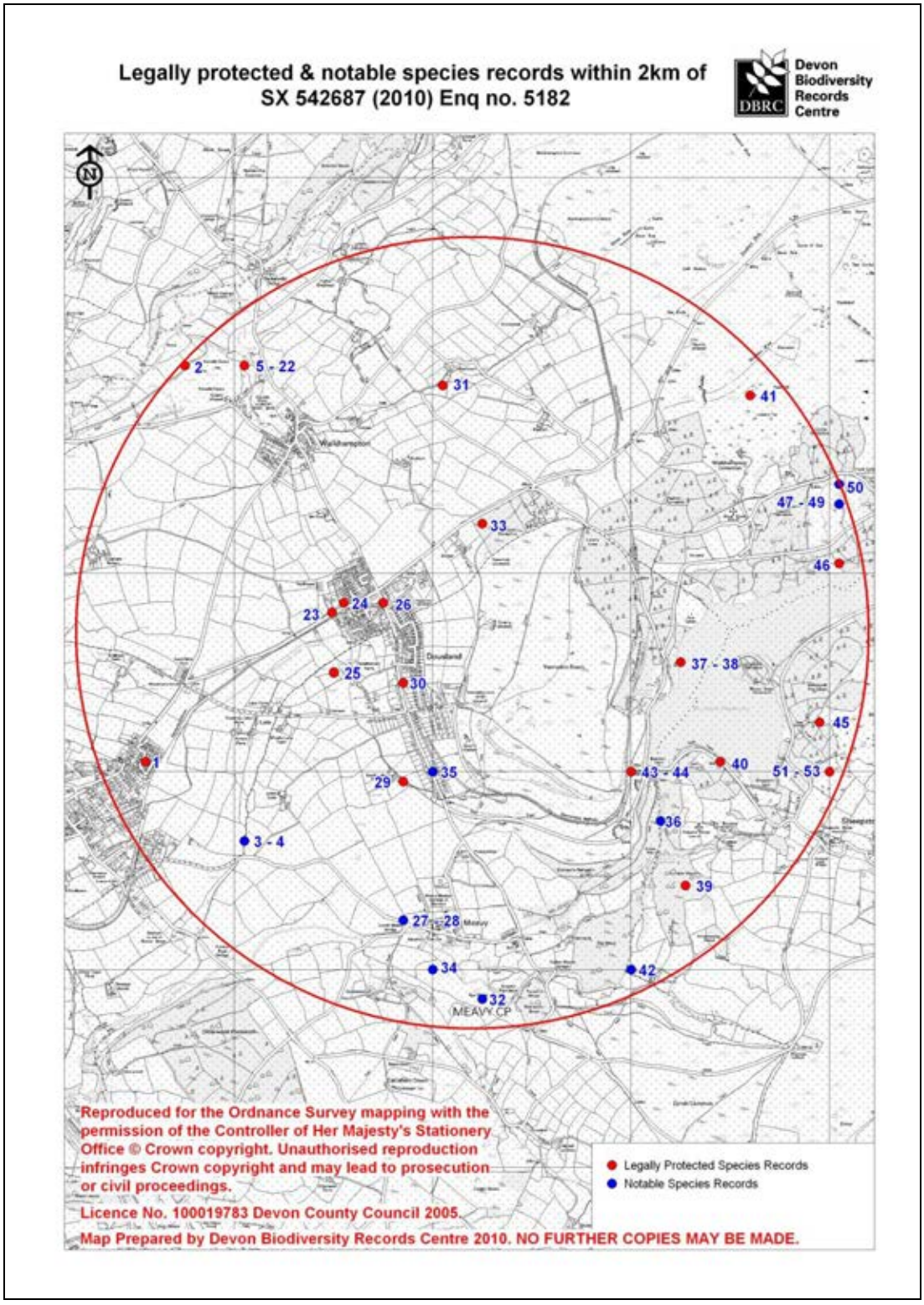
File Code	Site Name	Grid Reference	Area (ha)	Description	Status
SX56/028	Burrator Quarries	SX549677	0.4	Rare exposures of Permo-Carboniferous Dartmoor granite and Devonian country rocks of the Kate Brook Formation	SSSI
SX56/034	Parsons and Hay Woods	SX545668	1.1	Semi natural ancient woodland and wet woodland	CWS
SX56/035	Flat Wood	SX548671	10.5	Semi-natural ancient woodland with coppiced oak	CWS
SX56/036	Bowden Plantation	SX551677	4.5	Semi natural ancient woodland	CWS

File Code	Site Name	Grid Reference	Area (ha)	Description	Status
SX56/039	Burrator	SX560693	7.9	Acid flush, unimproved and semi-improved acid grassland	CWS
SX56/034	Parsons and Hay Woods	SX545668	3.1	Semi natural ancient woodland and wet woodland	UWS
SX56/037	Burrator Wood	SX552675	13.3	Semi natural ancient woodland	UWS

Sites of Special Scientific Interest (SSSI): these are notified by Natural England because of their plants, animals or geological features (the latter are geological SSSIs or gSSSI). Natural England needs to be consulted before any operations likely to damage the special interest are undertaken. SSSI is a statutory designation with legal implications.

County Wildlife Sites (CWS): these are sites of county importance for wildlife, designated on the basis of the habitat or the known presence of particular species. This is not a statutory designation like SSSIs, and does not have any legal status. County Wildlife Sites are usually included in Local Plans as sites of substantive nature conservation interest and are covered by Planning Policy Statement note nine (PPS9). CWS recognition does not demand any particular actions on the part of the Landowner and does not give the public rights of access. However, it may increase eligibility for land management grants.

Unconfirmed Wildlife Sites (UWS): these are sites identified as having possible interest but not fully surveyed. Some of these sites will be areas of significant wildlife interest


Legally protected & notable species records within 2km of
SX 542687 (2010) Enq no. 5182
Devon Biodiversity Records Centre
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MEAVY CP
Legally Protected Species Records
Notable Species Records
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Legally protected & notable Species within 2 kilometres of SX 542687 (2010) Enq 5182

No	Common Name	Scientific Name	Location	Date	Grid Reference	UK protection	International protection	Status
1	a Bat	Chiroptera	Barrycott, Binkham Hill, Yelverton.	1994	SX525680	WCA 5, 6	EC IVa; Bonn II	
2	Badger	Meles meles	Knowle Down, between Horrabridge and Walkhampton.	2000	SX527700	WCA 6, BA	Bern III	
3	Cornish Moneywort	Sibthorpia europaea	Meavy-Yelverton	1978	SX530676			NS; DN3
4	Cornish Moneywort	Sibthorpia europaea	Meavy-Yelverton	1978	SX530676			NS; DN3
5	Mullein Wave	Scopula marginepunctata	Huckworthy Hill, Walkhampton	1992	SX530700	NERC 41		UKBAP (P)
6	Rosy Rustic	Hydraecia micacea	Huckworthy Hill, Walkhampton	1992	SX530700	NERC 41		UKBAP (P)
7	Ruddy Carpet	Catarhoe rubidata	Huckworthy Hill, Walkhampton	1992	SX530700			Nb
8	Rustic	Hoplodrina blanda	Huckworthy Hill, Walkhampton	1992	SX530700	NERC 41		UKBAP (P)
9	Shaded Broad-Bar	Scotopteryx chenopodiata	Huckworthy Hill, Walkhampton	1992	SX530700	NERC 41		UKBAP (P)
10	Small Phoenix	Ecliptopera silaceata	Huckworthy Hill, Walkhampton	1992	SX530700	NERC 41		UKBAP (P)
11	White Ermine	Spilosoma lubricipeda	Huckworthy Hill, Walkhampton	1992	SX530700	NERC 41		UKBAP (P)

No	Common Name	Scientific Name	Location	Date	Grid Reference	UK protection	International protection	Status
12	August Thorn	Ennomos quercinaria	Huckworthy Hill, Walkhampton	1992	SX530700	NERC 41		UKBAP (P)
13	Beaded Chestnut	Agrochola lychnidis	Huckworthy Hill, Walkhampton	1992	SX530700	NERC 41		UKBAP (P)
14	Bleached Pug	Eupithecia expallidata	Huckworthy Hill, Walkhampton	1992	SX530700			Nb
15	Buff Ermine	Spilosoma luteum	Huckworthy Hill, Walkhampton	1992	SX530700	NERC 41		UKBAP (P)
16	Cloaked Carpet	Euphyia biangulata	Huckworthy Hill, Walkhampton	1992	SX530700			Nb
17	Dark-Barred Twin-Spot Carpet	Xanthorhoe ferrugata	Huckworthy Hill, Walkhampton	1992	SX530700	NERC 41		UKBAP (P)
18	Devon Carpet	Lampropteryx otregiata	Huckworthy Hill, Walkhampton	1992	SX530700			Nb
19	Dot Moth	Melanchra persicariae	Huckworthy Hill, Walkhampton	1992	SX530700	NERC 41		UKBAP (P)
20	Double Line	Mythimna turca	Huckworthy Hill, Walkhampton	1992	SX530700			Na
21	Green-Brindled Crescent	Allophyes oxyacanthae	Huckworthy Hill, Walkhampton	1992	SX530700	NERC 41		UKBAP (P)
22	Minor Shoulder-Knot	Brachylomia viminalis	Huckworthy Hill, Walkhampton	1992	SX530700	NERC 41		UKBAP (P)
23	Japanese Knotweed	Fallopia japonica	Princetown Road, Dousland (B3212)	2009	SX5349068801	WCA 9		
24	Japanese Knotweed	Fallopia japonica	B3212 Dousland, Yelverton (road verge/beside water)	2009	SX535688	WCA 9		
25	Japanese	Fallopia	Near Yelverton	2002	SX5368	WCA 9		

No	Common Name	Scientific Name	Location	Date	Grid Reference	UK protection	International protection	Status
	Knotweed	japonica						
26	Common Dormouse	Muscardinus avellanarius	Barons Road, Dousland.	2001	SX537688	WCA 5, 6; NERC 41	EC IVa; Bern III	UKBAP (P); DBAP
27	Cornish Moneywort	Sibthorpia europaea	Meavy, R Meavy W of bridge	1978	SX538672			NS; DN3
28	Cornish Moneywort	Sibthorpia europaea	Meavy, R Meavy W of bridge	1978	SX538672			NS; DN3
29	a Bat	Chiroptera	South Lake House, Dousland, Yelverton, Tavistock.	1994	SX538679	WCA 5, 6	EC IVa; Bonn II	
30	a bat	Chiroptera	Yennadon Lodge, Burrator Road, Dousland, Yelverton.	1999	SX538684	WCA 5, 6	EC IVa; Bonn II	
31	Common Lizard	Zootoca vivipara	Welltown	1996	SX540699	WCA 5 (KIS); NERC 41	Bern III	UKBAP (P)
32	Primrose	Primula vulgaris	Hay Wood	1997	SX542668			DBAP
33	a Bat	Chiroptera	Te Ware House, Dousland, Yelverton.	2004	SX542692	WCA 5, 6	EC IVa; Bonn II	
34	Purple Hairstreak	Quercusia quercus	MEAVY	1999	SX5467			Decline
35	Purple Hairstreak	Quercusia quercus	Burrator	1998	SX5468			Decline
36	Cornish Moneywort	Sibthorpia europaea	Bowden Plantation; Bowden Plantation East	1997	SX551677			NS; DN3
37	45 Khz Pipistrelle	Pipistrellus pipistrellus 45kHz	Burrator Lodge	2001	SX552685	WCA 5, 6	EC IVa; Bern III, Bonn II	
38	Brown Long-Eared Bat	Plecotus auritus	Burrator Lodge	2001	SX552685	WCA 5, 6; NERC 41	EC IVa; Bern II; Bonn II	UKBAP (P)
39	Badger	Meles meles	Burrator Wood, near	1999	SX55276742	WCA 6, BA	Bern III	

No	Common Name	Scientific Name	Location	Date	Grid Reference	UK protection	International protection	Status
			Meavy.					
40	Black Redstart	Phoenicurus ochruros	Burrator Reservoir	2009	SX554680	WCA 1		Amber
41	Grayling	Hipparchia semele	PEEK HILL	1991	SX556699	NERC 41		UKBAP (P)
42	Purple Hairstreak	Quercusia quercus	BOWDEN'S PLNTN.	1999	SX5567			Decline
43	Small Heath	Coenonympha pamphilus	BURRATOR RESERVOIR	2001	SX5568	NERC 41		UKBAP (P)
44	Small Pearl-bordered Fritillary	Boloria selene	BURRATOR RESERVOIR	1990	SX5568	NERC 41		UKBAP (P); Decline
45	Common Lizard	Zootoca vivipara	Near Burrator Reservoir, Yelverton.	2003	SX559682	WCA 5 (KIS); NERC 41	Bern III	UKBAP (P)
46	Small Heath	Coenonympha pamphilus	Burrator Reservoir, Nr. Sheepstor	1984	SX560690	NERC 41		UKBAP (P)
47	Round-Leaved Crowfoot	Ranunculus omiophyllus	Burrator	1996	SX560693			DN1
48	Cornish Moneywort	Sibthorpia europaea	Burrator	1996	SX560693			NS; DN3
49	Ivy-Leaved Bellflower	Wahlenbergia hederacea	Burrator	1996	SX560693			DN3
50	Keeled Skimmer	Orthetrum coerulescens	Burrator [Crossgate], Yelverton	1998	SX560694			KeyD (N)
51	Small Heath	Coenonympha pamphilus	Yellowmead Down	1997	SX5668	NERC 41		UKBAP (P)
52	Purple Hairstreak	Quercusia quercus	Yellowmead Down	1998	SX5668			Decline
53	Wall Brown	Lasiommata megera	Yellowmead Down	1998	SX5668	NERC 41		UKBAP (P)

NERC 41	**NERC Act (2006) Section 41:** Species listed under Section 41 of the Natural Environment and Rural Communities Act (2006). These are the species found in England which have been identified as requiring action under the UK BAP. All local authorities and other public authorities in England and Wales have a duty to promote and enhance biodiversity in all of their functions.
WCA 1	**Wildlife and Countryside Act (1981) Schedule 1:** birds which are protected by special penalties at all times.
WCA 5	**Wildlife and Countryside Act (1981) Schedule 5:** species protected against killing, injury, disturbance and handling.
WCA 5 (KIS)	**Wildlife and Countryside Act (1981) Schedule 5: (killing & injury):** species protected against killing, injury and sale only.
WCA 6	**Wildlife and Countryside Act (1981) Schedule 6:** animals (other than birds) which may not be killed or taken by certain methods
WCA 9	**Wildlife and Countryside Act (1981) Schedule 9:** animals and plants for which release into the wild is prohibited.
BA	**Protection of Badgers Act 1992:** badgers may not be deliberately killed, persecuted or trapped except under licence. Badger setts may not be damaged, destroyed or obstructed.
Bern II	**Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) Appendix II:** Special protection for listed animal species and their habitats.
Bern III	**Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) Appendix III:** Exploitation of listed animal species to be subject to regulation
ECIVa, IVb	**EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats & Species Directive) Annex IVa:** Exploitation of listed animals and plants to be subject to management if necessary.
Bonn II	**Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) Appendix II:** Range states encouraged to conclude international agreements to benefit species listed.
UKBAP(P)	**UK Priority Species (Short and Middle Lists - UK Biodiversity steering Group Report 1995)** i.e. species that are globally threatened and rapidly declining in the UK (by more than 50% in the last 25 years). Has a Species Action Plan.
DBAP	**Devon Biodiversity Action Plan species:** these have been identified as species of key conservation concern in Devon.

NS **Nationally Scarce:** 15-100 10km squares in Atlas of British Flora 1962.

Devon Notable Species: Selected species recorded from over 50 2km squares in the Atlas of Devon Flora 1984 (R.B. Ivimey-Cook, Department of Biological Sciences, The University of Exeter).

DN1 **Devon Notable[1]:** 1-25 2 km squares in Atlas of Devon Flora 1984.

DN3 **Devon Notable[3]:** Selected species recorded from over 50 2 km squares in Atlas of Devon Flora 1984.

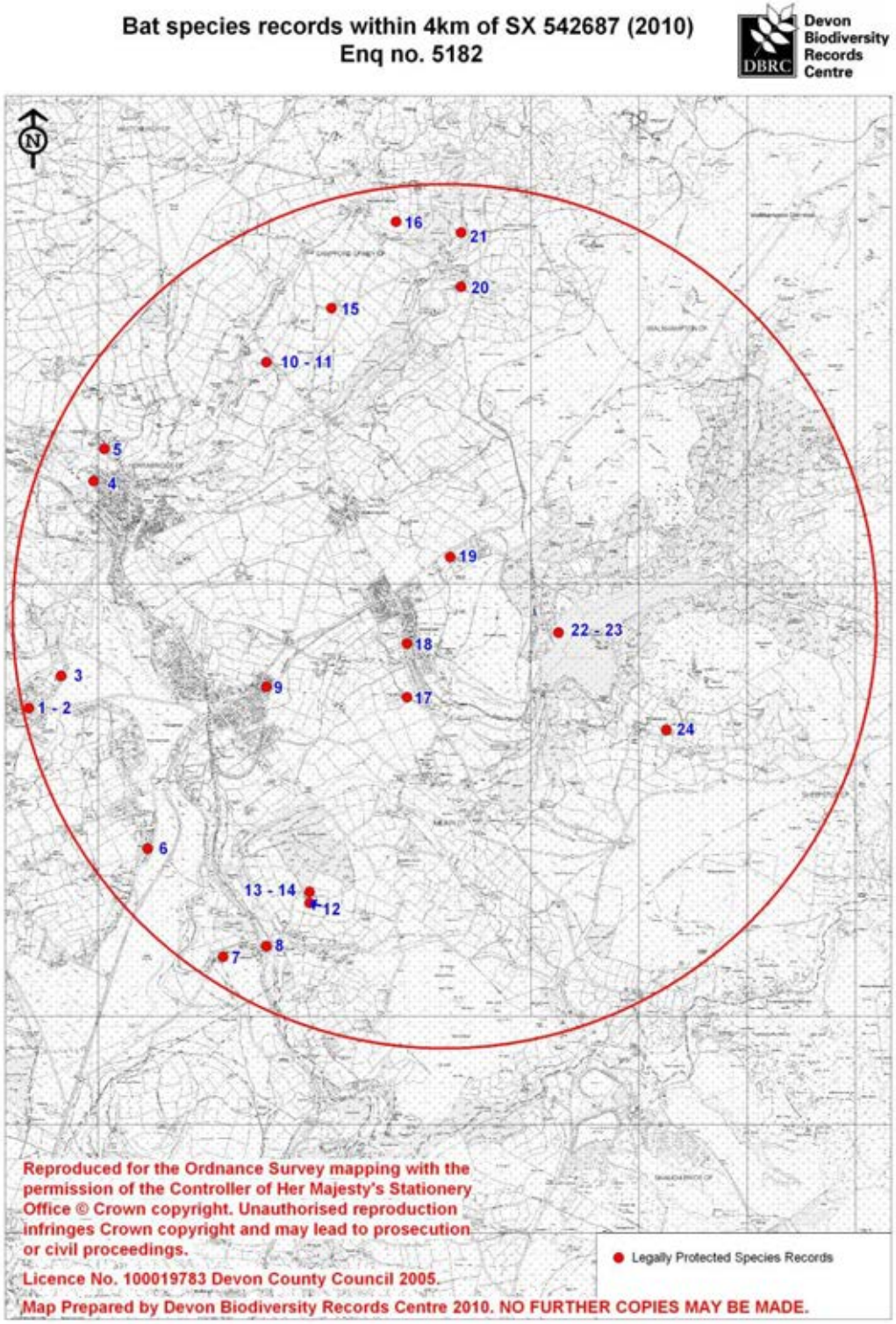
Na **Nationally Notable A:** known from 30 or fewer 10km squares. Taken from the Invertebrate Site Register.

Nb **Nationally Notable B:** known from 100 or fewer 10km squares. Taken from the Invertebrate Site Register.

Decline Substantial local decline in Devon

Amber List Bird species of medium conservation concern, such as those whose population is in moderate decline, rare breeders, internationally important and localised species and those of unfavourable conservation status in Europe.

KeyD (N) **Nationally Important Key Dragonfly Species:** those which have been recorded in less than 10% of 10km squares in Britain. Those occurring in Devon are White-legged damselfly (Playcnemis pennipes) Scarce blue-tailed damselfly (Ischnura pumilio) Small red damselfly (Ceriagrion tenellum) Hairy dragonfly (Bracytron pratense) Downy emerald (Cordulia aenea) and Keeled skimmer (Orthoetrum coerulescens).


Bat species records within 4km of SX 542687 (2010)
Enq no. 5182
Devon Biodiversity Records Centre
DBRC
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Legally Protected Species Records

Bat Species within 4 kilometres of SX 542687 (2010) Enq 5182

No	Common Name	Scientific Name	Location	Date	Sex or Stage	Abundance	Grid Reference	Comment	Data Source	UK protection	International protection	Status
1	Pipistrelle	Pipistrellus pipistrellus	Black Lion Cottage, The Glade, Crapstone, Yelverton.	2003	present	Present	X503678	None seen at time of visit (20.2.04) and no droppings, but owners see bats exiting early evening in the summer months. Roost possibly inside flat roof of dormer and behind hanging tiles on dormer side. EN bat archives 2004.	English Nature Bat Archive	WCA 5, 6	EC IVa; Bern III, Bonn II	
2	Pipistrelle	Pipistrellus pipistrellus	Black Lion Cottage,The Glade, Crapstone, Yelverton.	2003	present		SX503678			WCA 5, 6	EC IVa; Bern III, Bonn II	

No	Common Name	Scientific Name	Location	Date	Sex or Stage	Abundance	Grid Reference	Comment	Data Source	UK protection	International protection	Status
3	a Bat	Chiroptera	Tamar House, Crapstone, Yelverton	1991	Droppings	Present	SX506681	Small quantity of old droppings which implies that the roof is occupied from time to time but is unlikely to be major nursery roost. No bats present. [EN bat archive 1991]	English Nature Bat Archive	WCA 5, 6	EC IVa; Bonn II	

No	Common Name	Scientific Name	Location	Date	Sex or Stage	Abundance	Grid Reference	Comment	Data Source	UK protection	International protection	Status
4	Lesser Horseshoe Bat	Rhinolophus hipposideros	Copperfields, Horrabridge, Yelverton (garage)	2007	present	present	SX509699	Live adult and volant juvenile still attached; one dead baby bat about seven days old which has been dead about a week. Roost in roof apex in garage attached to main dwelling. Small collection of droppings (c 100) on items in garage.	English Nature Bat Archive	WCA 5, 6; NERC 41	EC IIa, IVa; Bern II; Bonn II	UKBAP (P)

No	Common Name	Scientific Name	Location	Date	Sex or Stage	Abundance	Grid Reference	Comment	Data Source	UK protection	International protection	Status
5	Brown Long-Eared Bat	Plecotus auritus	Copperfields, Horrabridge, Yelverton (garage)	2007	present	present	SX510702	No evidence to suggest high numbers, or a natal or nursery site, probably multi-seasonal usage. Two seen at time of visit. Roost in roof apex and on purlin. Droppings are generally in an even layer under ridge line, no cluster heaps to suggest prolonged	English Nature Bat Archive	WCA 5, 6; NERC 41	EC IVa; Bern II; Bonn II	UKBAP (P)
6	A bat	Chiroptera	Yelverton Golf Club, Golf Links Road, Yelverton.	1994	Droppings	present	SX514665	No survey form available. [Grid ref for club house provided.] Timber treatment company reported bat droppings to EN (15/4/94). EN bat archives 1994	English Nature Bat Archive	WCA 5, 6	EC IVa; Bonn II	

No	Common Name	Scientific Name	Location	Date	Sex or Stage	Abundance	Grid Reference	Comment	Data Source	UK protection	International protection	Status
7	a Bat	Chiroptera	Rosehill, Clearbrook, Yelverton	2007	present	present	SX521655	Bat roost in attic but no bats present at time of visit. New owners not supposed to mind the bats - due to move in a couple of months' time. [Definitely a bat roost but no other details available as record transcribed from email and not bat roost form.]	English Nature Bat Archive	WCA 5, 6	EC IVa; Bonn II	
8	a Bat	Chiroptera	Underwood, Clearbrook, Yelverton.	1996	present	present	SX525656	Surveyor and date of survey uknown (survey form not available). No bats seen and old droppings found. See file note dated 15/10/96.	English Nature Bat Archive	WCA 5, 6	EC IVa; Bonn II	

No	Common Name	Scientific Name	Location	Date	Sex or Stage	Abundance	Grid Reference	Comment	Data Source	UK protection	International protection	Status
9	A bat	Chiroptera	Barrycott, Binkham Hill, Yelverton.	1994	Droppings	present	SX525680	Possibly Pipistrelle bats. None seen. Roost in cavity wall with some excursions to underfelt and purlins close to end wall. Droppings from 1994 & 1993. Exclusion required. EN bat archives 1994.	English Nature Bat Archive	WCA 5, 6	EC IVa; Bonn II	
10	Brown Long-Eared Bat	Plecotus auritus	Brook House, Sampford Spiney, nr Yelverton	2007	present	present	SX525710	Probably a medium summer colonly (<30 bats with other seasonal usage) in the southern void, with bats roosting against the chimney, and some occupation throughout the remaining sections. Eleven counted in roof apex at time of visit. Droppings generally l	English Nature Bat Archive	WCA 5, 6; NERC 41	EC IVa; Bern II; Bonn II	UKBAP (P)

No	Common Name	Scientific Name	Location	Date	Sex or Stage	Abundance	Grid Reference	Comment	Data Source	UK protection	International protection	Status
11	a Bat	Chiroptera	Brook House, Sampford Spiney, Yelverton.	1996	present	Present	SX525710	EN bat archives 1996. 'Evidence' of bats reported to English Nature by surveyor, but owner does not think she has bats. No bat visit arranged.	English Nature Bat Archive	WCA 5, 6	EC IVa; Bonn II	
12	a Bat	Chiroptera	Hoo Meavy Farm, Yelverton (house)	1992		present	SX529660	No survey form. Details taken from EN letter to owner dated 7/1/92. Timber treatment company reported evidence of bats in loft [EN bat archive 1992]	English Nature Bat Archive	WCA 5, 6	EC IVa; Bonn II	

No	Common Name	Scientific Name	Location	Date	Sex or Stage	Abundance	Grid Reference	Comment	Data Source	UK protection	International protection	Status
13	Brown Long-Eared Bat	Plecotus auritus	Hoo Meavy Farm, Hoo Meavy, Nr Yelverton, Plymouth.	2004	present	present	SX529661	One seen in roof area. Droppings liberally spread on most surfaces particularly in newer part of roof space. Greatest concentration under roof apex. Probably use roof all year round. Possibly greater use during summer.	English Nature Bat Archive	WCA 5, 6; NERC 41	EC IVa; Bern II; Bonn II	UKBAP (P)
14	Pipistrelle	Pipistrellus pipistrellus	Hoo Meavy Farm, Hoo Meavy, Nr Yelverton, Plymouth.	2004	present	present	SX529661	Droppings liberally spread on most surfaces particularly in newer part of roof space. Greatest concentration under roof apex. Probably use roof all year round. Possibly greater use during summer.	English Nature Bat Archive	WCA 5, 6	EC IVa; Bern III, Bonn II	

No	Common Name	Scientific Name	Location	Date	Sex or Stage	Abundance	Grid Reference	Comment	Data Source	UK protection	International protection	Status
15	a Bat	Chiroptera	Stourtown Cottage, Sampford Spiney, Yelverton.	1994	present	present	SX531715	No survey form available (though J Kaczanow to visit). Owner has bats in roof. Thought to be present from about three weeks ago. (EN file note dated 12/12/94) EN bat archives 1994	English Nature Bat Archive	WCA 5, 6	EC IVa; Bonn II	
16	a Bat	Chiroptera	Stoney Croft, Sampford Spiney, Yelverton.	1997	present	Present	SX537723	None seen. Possibly brown long-eared and pipistrelles. Fresh & old droppings.	Incidental Species Records	WCA 5, 6	EC IVa; Bonn II	

No	Common Name	Scientific Name	Location	Date	Sex or Stage	Abundance	Grid Reference	Comment	Data Source	UK protection	International protection	Status
17	A bat	Chiroptera	South Lake House, Dousland, Yelverton, Tavistock.	1994	Droppings	present	SX538679	Roost in roof apex. None seen at time of survey. Unidentified medium to large bat. Fresh droppings (only a few). EN bat archives 1994.	English Nature Bat Archive	WCA 5, 6	EC IVa; Bonn II	
18	a Bat	Chiroptera	Yennadon Lodge, Burrator Road, Dousland, Yelverton.	1999	present	Present	SX538684	English Nature bat archives - 1999. None seen.	English Nature Bat Archive	WCA 5, 6	EC IVa; Bonn II	
19	a Bat	Chiroptera	Te Ware House, Dousland, Yelverton.	Jun-05	present	present	SX542692	No visit made but owner reported bats flying in rooms on two occasions.	English Nature Bat Archive	WCA 5, 6	EC IVa; Bonn II	

No	Common Name	Scientific Name	Location	Date	Sex or Stage	Abundance	Grid Reference	Comment	Data Source	UK protection	International protection	Status
20	Pipistrelle	Pipistrellus pipistrellus	Furzetor, Sampford Spiney, Tavistock.	2004	present	present	SX543717	None seen. Roost under slates. Small deposits of droppings (dry & fresh) under gaps in felt throughout roof space. Likely to be used all year round.	English Nature Bat Archive	WCA 5, 6	EC IVa; Bern III, Bonn II	
21	Noctule	Nyctalus noctula	Ward Bridge near Sampford Spiney	2007	hunting	3	SX543722	Hunting over meadow beside River Walkham at dusk.	Incidental Species Records	WCA 5, 6; NERC 41	EC IVa; Bern II; Bonn II	UKBAP (P)
22	45 Khz Pipistrelle	Pipistrellus pipistrellus 45kHz	Burrator Lodge	2001	present	1	SX552685	One plus lots of signs	Incidental Species Records	WCA 5, 6	EC IVa; Bern III, Bonn II	

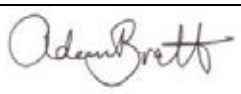
No	Common Name	Scientific Name	Location	Date	Sex or Stage	Abundance	Grid Reference	Comment	Data Source	UK protection	International protection	Status
23	Brown Long-Eared Bat	Plecotus auritus	Burrator Lodge	2001	present	Present	SX552685		Incidental Species Records	WCA 5, 6; NERC 41	EC IVa; Bern II; Bonn II	UKBAP (P)
24	A bat	Chiroptera	Lambs Park, Sheepstor, Yelverton.	1994	present	present	SX562676	Nursrey roost. File note of 30/6/94 shows owner discovered many bats in loft after finding baby bat on ground. Many droppings. Owner had noted bats previously. John Kaczanow supposed to visit in July but no survey available.EN bat archives 1994.	English Nature Bat Archive	WCA 5, 6	EC IVa; Bonn II	

Ecology Chapter Report

Site: Yennadon Quarry

Client: Yennadon Quarry Ltd.

Date: November 2011

Prepared by	Adam Bratt BSc (Hons), MIEEM	
Checked by	Sue Searle BSc (Hons), PGDip (Ecology), MIEEM	
Approved by	Sue Searle BSc (Hons), PGDip (Ecology), MIEEM	

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IEEM Member subject to the Code of Professional Conduct.

Contents

1.1 Introduction

This section of the Environmental Statement has been prepared by Acorn Ecology Ltd. and assesses the ecological effects of the proposed quarry extension at Yennadon Quarry.

This chapter follows the procedure of ecological impact assessment with reference to guidance produced by the Institute of Ecology and Environmental Management (IEEM). This chapter covers the methods used to gather baseline ecological data, the results of those studies, assessment of impacts, mitigation strategies and residual effects.

Technical ecological survey reports including the Phase 1 habitat survey report and separate species reports are given as an appendix to the Environmental Statement.

1.2 Methodology

Desk Study

A desk study was undertaken by obtaining a biological records search through the Devon Biodiversity Records Centre (DBRC) during November 2010. The data search identified records of statutory and non-statutory sites (such as Special Areas of Conservation (SACs), Sites of Special Scientific Interest (SSSIs) and County Wildlife Sites (CWSs)) and legally protected or notable species within 2km of OS grid reference SX 542 687.

Due to the mobility of bat species an additional data search for records of bat species was undertaken through DBRC to a radius of 4km of the site. A search on the National Biodiversity Network website (www.nbn.org.uk) for records of high brown fritillary (*Argynnis adippe*) was also undertaken.

A Phase 1 habitat survey report for the site produced by *Rural Arisings* (August 2006) was also referred to during the study.

Field Survey

The various field survey methodologies undertaken are discussed below:

Extended Phase 1 Habitat Survey

A Phase 1 Habitat survey was undertaken on the 9th November 2010 by Ecologist Adam Bratt BSc (Hons), AIEEM. The standard methodology for identifying habitats as published by the JNCC (2010) was followed. In addition to this signs of and potential for protected species was noted.

Badger Survey

Signs of badgers (e.g. setts, latrines, foraging signs etc.) were surveyed for during the Phase 1 Habitat survey on the 9th November 2010. This was supplemented with additional checks on the activity level of setts present during surveys for other protected species during the period April to August 2011.

Bat Survey

Potential for the quarry to be used by bats for roosting was identified during the Phase 1 Habitat survey on the 9th November 2010. This was followed by two transect surveys (undertaken in June and July 2011) by Adam Bratt and Sarah Candlin BSc (Hons), AIEEM following guidelines published by the Bat Conservation Trust (2007). One survey was conducted at dusk and one at dawn. Surveyors were equipped with duet and Anabat SD1/SD2 bat detectors.

Routes were walked around the quarry to incorporate areas where bats could potentially be roosting. Stopping locations were incorporated into the routes taken to watch areas where bats may emerge (or re-enter) potential roost sites.

Table 1. Bat survey 1 details (dusk)

Survey Date	16th June 2011
Lead Ecologist	Sarah Candlin BSc (Hons), AIEEM NE Bat Survey Licence 20112238
Assistant	Charlotte Bellamy BSc (Hons)
Time of sunset	21:30
Start time	21:20
Finish time	23:25
Weather conditions	12°C, 45% cloud cover, wind force 2/3, dry

Table 2. Bat survey 2 details (dawn)

Survey Date	26th July 2011
Lead Ecologist	Adam Bratt BSc (Hons), AIEEM NE Bat Survey Licence 20113708
Assistant	Ele Cooper BSc (Hons), MSc
Time of sunrise	05:32
Start time	03:45
Finish time	05:30
Weather conditions	14°C, 80% cloud cover, wind force 2/3, dry

The number of bat passes was recorded during each survey. Bat passes do not equate to the number of bats present (and as a single bat may make several passes, and passes are often much higher than the number of bats encountered) but do give an indication of levels of bat activity present on a site.

Botanical survey

A botanical list was compiled during ecological survey visits between November 2010 and September 2011. A specific botanical survey was compiled by Senior Ecologist Sue Searle BSc (Hons), PGDip (Ecology), MIEEM on the 22nd September 2011.

Breeding Bird Survey

An assessment of the breeding bird assemblage surrounding the quarry was undertaken by Adam Bratt following a methodology similar to the British Trust for Ornithology (BTO) Common Bird Census

(CBC). A transect was walked around the site and birds (and their activity) recorded onto a map of the survey area.

Three visits were undertaken during suitable conditions (one in April, May and June 2011). The survey information allowed an assessment of which species were breeding within the survey area, and an estimation of the number of pairs present.

Table 3. Survey details

Survey date	Surveyor*	Sunrise time	Start time	Finish time	Weather conditions
07.04.11	AB	06:30	06:20	08:20	10°C, dry, <10% cloud cover, wind force 0-1, dry
13.05.11	AB	05:30	05:30	07:45	8°C, dry, 10% cloud cover, wind force 1-2, dry
14.06.11	AB	05:03	06:15	07:45	8°C, dry, 10% cloud cover, wind force 0-1, dry

*AB Adam Bratt BSc (Hons), AIEEM

Butterfly Survey

A survey for larval food plants of the high brown fritillary was undertaken by Adam Bratt on the 7th April 2011. The area of proposed new quarry was walked and the presence of violets noted. The frequency of occurrence of violets within the survey area was assessed against the DAFOR scale (dominant, abundant, frequent, occasional and rare).

A survey for larva of the high brown fritillary was also undertaken by Adam Bratt on the 7th April 2011. Thirty patches of bracken litter (each approximately 2 m^2) within the area of proposed new quarry were visually inspected. Each patch of bracken was inspected for between 1-2 minutes for the presence of larvae (caterpillars). Weather conditions were 14°C, dry and 50% cloud cover.

Three walked transect surveys were conducted between July and August 2011 to determine the presence of adult butterflies within the area of proposed new quarry. Surveys were carried out based on methodology used in the UK Butterfly Monitoring Scheme.

The transect comprised seven sections throughout the area of proposed new quarry and the immediate surrounds, totaling approximately 1km in length and covering a representation of the habitats present. The habitat within each section was described using the habitat classification for butterfly transects produced by the UK Butterfly Monitoring Scheme.

Surveys were undertaken during suitable weather conditions (either 13-17°C with at least 60% sunshine or over 17°C and not raining) and where possible between the hours of 10:45 and 15:45 hours.

Transects were walked at a steady, slow pace to enable identification of butterflies seen. All butterflies within 2.5m either side of the surveyor (and 5m in front) were recorded. Binoculars were available to aid with identification.

Table 4. Details of butterfly surveys undertaken at Yennadon Quarry.

Survey type	Date	Surveyor*	Weather conditions and times (where appropriate)
Larval food plant survey	7th April 2011	AB	14°C, 50% cloud cover, dry.
Larval survey	7th April 2011	AB	14°C, 50% cloud cover, dry.
Transect survey 1	15th July 2011	AB	Start time: 11:30 18°C, 100% cloud cover, dry.
Transect survey 2	27th July 2011	AB	Start time: 14:45 25°C, 20% cloud cover, dry.
Transect survey 3	9th August 2011	SS	Start time: 16:45 18°C, 15% cloud cover, dry.

*AB Adam Bratt BSc (Hons), AIEEM
SS Sue Searle BSc (Hons), PG Dip (Ecology), MIEEM

Reptile Survey

Standard methods for conducting reptile surveys were employed, including refugia surveys and walked transects aimed at identifying basking reptiles.

34 reptile refugia (either bitumen roofing felt squares or sheets of corrugated bitumen or metal, measuring at least 0.5m^2) were placed in suitable habitat within the area of proposed new quarry to the north of the existing quarry in April 2011. Tiles were then checked on seven occasions for presence of reptiles during suitable weather conditions.

Four walked transect surveys were conducted between April and June 2011 to determine the presence of reptiles basking in areas of the site other than under or on top of reptile tiles. Each survey consisted of walking four North/ South routes through the proposed new quarry area and identifying any reptiles basking.

Table 5. Details of reptile surveys undertaken at Yennadon Quarry.

Survey type	Date and Time	Surveyor	Weather conditions and times (where appropriate)
Transect Survey 1	7th April 2011 11:00	AB	14°C, 50% cloud cover, dry.
Refugia Survey 1	19th April 09:15	EC	18°C, 20% cloud cover, dry.
Refugia Survey 2	21st April 2011 08:50	EC	18°C, 5% cloud cover, dry.
Refugia Survey 3	26th April 2011 08:50	EC	14°C, 20% cloud cover, dry.
Refugia Survey 4 Transect Survey 2	10th May 2011 09:10	EC	13°C, 70% cloud cover, dry.
Refugia Survey 5 Transect Survey 3	13th May 2011 08:30	AB	12°C, 100% cloud cover, dry.
Refugia Survey 6	14th June 2011	AB	12°C, 0% cloud cover, dry.

Transect Survey 4	08:00		
Refugia Survey 7	15th July 2011 10:45	AB	16°C, 100% cloud cover, dry.

*AB Adam Bratt BSc (Hons), AIEEM
EC Eleanor Cooper BSc (Hons), MSc

Method of Ecological Evaluation

When assessing the ecological value of the site, regard has been given to the Guidelines for Ecological Impact Assessment in the United Kingdom published by the Institute of Ecology and Environmental Management (IEEM 2006).

Assigning Ecological Value

Assigning value to ecological features is a key part of the assessment process but one that is both complex and subjective and which the guidelines recognise requires a level of professional judgement. Consideration is given to a range of factors including geographic frame of reference, designated sites, biodiversity value, potential value, secondary or supporting value, social value and legally protected sites and species. The UK and Dartmoor Biodiversity Action Plans have been referred to in this process where appropriate.

For each habitat or species (or species group) present, their importance has been given in a geographical context using the following hierarchy:

- International
- National (UK)
- Regional (Southwest)
- County (Devon)
- District (Dartmoor National Park)
- Local (Parish)
- Site

Predicting and Characterising Ecological Impacts

In addition to determining ecological value of features, the anticipated level of impact arising from proposals is also considered. When considering impacts consideration is given to a number of factors including whether impacts are positive or negative, the magnitude of impact, the extent, duration, reversibility, timing and frequency. Using these factors to characterise impacts allows an assessment of significance to be employed with reference to impacts.

Significance of Ecological Impacts

An "ecologically significant impact is defined as an impact (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area" (IEEM 2006).

A judgement has therefore been given based on whether the effects on the integrity or conservation status of each ecological feature will be significant. The impact significance is determined at the appropriate geographical level. For example, although the impact on a feature may be limited or negligible at a county level, they may be significant at a local level.

1.3 Baseline Conditions

This section outlines and summarises the findings of the ecological surveys undertaken at Yennadon Quarry. Full details of the desk and field studies undertaken are provided in the survey reports within the technical appendices of this report.

Desk Study

Full results of the desk study are given in the Phase 1 Habitat survey report.

Statutory Designated Sites

The site is not within any statutory sites of nature conservation interest, however the site is fully within Dartmoor National Park. There is one Site of Special Scientific Interest (SSSI) located within 2km. This is Burrator Quarries SSSI located approximately 1.2km to the southeast of Yennadon Quarry (grid reference SX549677). Burrator Quarries have been designated due to their geological (and not ecological) interest.

Non-Statutory Designated Sites

The site does not lie within any non-statutory sites of nature conservation interest. There are four County Wildlife Sites (CWS) and two Unconfirmed Wildlife Sites (UWS) within 2km of Yennadon Quarry. These include sites with semi-natural ancient woodland, acid flush and unimproved and semi-improved acid grassland. The closest of these sites is Bowden Plantation CWS (grid reference SX551677) located approximately 1.1km to the southeast, comprising of semi-natural and ancient woodland.

Protected and Notable Species

The records search with the Devon biodiversity Records Centre (DBRC) returned fifty three records of legally protected or notable plant and animal species within 2km of Yennadon Quarry. Protected and notable species include common lizard, badger, dormouse and butterfly and moth species.

An additional search for bats (within 4km of the site) included results for common pipistrelle, brown long-eared, lesser horseshoe and noctule. None of these records are within the survey area. However this is potentially due to lack of survey effort or non-submission of records.

Habitats

Details and locations of habitats can be seen within the Phase 1 Habitat survey report, including a Phase 1 Habitat map.

Unimproved acid grassland

Land to the north of the existing quarry (and proposed quarry extension) comprises of a mosaic of unimproved acid grassland, gorse and bracken. Vegetation in this area is maintained at a very short sward height by the extensive grazing of livestock (sheep, ponies and cattle).

Grass species present include purple moor grass *Molinia caerulea*, common bent *Agrostis capillaris*, bristle bent *Agrostis curtisii*, wavy hair grass *Deschampsia flexuos,* cock"s-foot *Dactylis glomerata*, and fescues *Festuca* sp. Other plant species include tormentil *Potentilla erecta*, heath bedstraw *Galium mollugo*, common mouse ear *Cerastium fontanum*, common sorrel *Rumex acetosa*, sheep"s sorrel *Rumex acetosella*, heath milkwort *Polygala serpyllifolia*, common dog violet *Viola riviniana*, foxglove *Digitalis purpurea*, bell heather *Erica cinerea* and heath wood-rush *Luzula multiflora*.

Bracken

Bracken *Pteridium aquilinum* covers in excess of 50% of the area of proposed quarry extension. The densest areas of bracken cover the western part of the new quarry area extending towards the hedgerow at the western boundary of the site. Bracken covers areas of unimproved acid grassland (as described above).

Scrub

Scattered gorse scrub covers areas to the north of the existing quarry. The majority of gorse present is European gorse *Ulex europaeus*, although western gorse *Ulex gallii* is present in small quantities too.

Dense European gorse is also present surrounding the active quarry (primarily on the southern periphery of actively worked areas). Scrub consisting of bramble *Rubus fructicosus*, blackthorn *Prunus spinosa* and small amounts of buddleia *Buddleia davidii* is also present surrounding the active quarry area.

Scattered trees

Scattered trees including sessile oak *Quercus petraea* and hawthorn *Crataegus monogyna* are present in areas of dense bracken to the north and west of the quarry. Several small planted specimens including ash *Fraxinus excelsior*, silver birch *Betula pendula* and beech *Fagus sylvatica* are present amongst dense scrub immediately to the west of the quarry.

Hedgerow

An intact, species-rich hedgerow is located to the west of the quarry running in a north/south direction. This hedgerow marks the boundary between enclosed pasture to the west and unencclosed and unimproved acid grassland to the east. Woody species present include sessile oak, hazel *Corylus avellana*, alder *Alnus glutinosa*, blackthorn, holly *Ilex aquifolium*, elder *Sambucus nigra* and European gorse. Other plant species include foxglove, bilberry *Vaccinium myrtillus* and ferns *Dryopteris sp*.

Quarry

Yennadon quarry is an active slate quarry comprising exposed rock and spoil piles consisting of broken aggregate. Although some of the older spoil piles to the south and west have been colonised by scrub, the majority of recent piles are moved relatively regularly and are not vegetated.

The northern (and to some extents eastern) faces are those most worked during 2011 and include steep vertical rock faces up to approximately 15m in height.

Buildings

An open-fronted wooden building used as a stone cutting shed is present within the quarry. Offices in Portakabin/metal containers are present at the southern end of the quarry.

Protected Species

Detailed reports concerning each of the following species/ species groups can be read within the technical appendices of this report.

Badgers

Two badger setts (consisting of one and two entrances respectively) were identified in the hedge bank of the hedgerow to the west of Yennadon Quarry. These setts have shown evidence of current use during the entire survey period (November 2010 to August 2011) and despite its relatively small size the larger sett may be used for breeding and therefore may be a main sett for badgers.

The amount of spoil associated with the sett entrances indicates that the setts present are small, and likely to be restricted to the hedge bank.

Two other mammal burrows with single entrance holes were identified to the north of Yennadon Quarry (within the proposed quarry extension area). Although large enough for a badger to access, neither of these entrances showed signs of current use by badgers during the survey period.

Bat species

During the Phase 1 habitat survey no obvious bat roost sites were noted. Trees to the north of the quarry comprise of relatively small hawthorn trees with no potential to be used by bats for roosting.

The buildings on site (Portakabins and open fronted cutting shed) are considered largely unsuitable to be used by roosting bats either due to high light levels, high levels of noise disturbance or lack of suitable crevices for roosting. Although the quarry faces have no obvious large crevices, bat activity surveys were used to determine whether a roost was present within the quarry.

The dusk survey conducted in June 2011 did not identify any bats emerging from roost sites within the quarry. Passes by both common pipistrelle *Pipistrellus pipistrellus* and noctule *Nyctalus noctula* bats were recorded during the survey both within and on the edge of the quarry.

The dawn survey conducted in July 2011 did not identify any swarming behaviour by bats or re-entry to roost sites. Small numbers of passes by common pipistrelle bats were recorded both within and on the edge of the quarry.

The following tables show the number of bat passes recorded during the two surveys.

Table 6. Bat passes recorded during the survey (16th June 2011)

Time	Species	Number of bat passes
21:53	Common pipistrelle	1
21:54	Common pipistrelle	4
21.55	Common pipistrelle	4
21:56	Common pipistrelle	3
21:57	Common pipistrelle	4
21:58	Common pipistrelle	4
21:59	Common pipistrelle	4
22:00	Common pipistrelle	3
22:01	Common pipistrelle	4
22:02	Common pipistrelle	4
22:03	Common pipistrelle	4
22:04	Common pipistrelle	4
22:05	Common pipistrelle	2
22:06	Common pipistrelle	4
22:07	Common pipistrelle	4
22:08	Common pipistrelle	4
22:09	Common pipistrelle	2
22:10	Common pipistrelle	1
22:11	Noctule	1
22:13	Common pipistrelle	1
22:15	Noctule	4
22:16	Noctule	3
22:18	Noctule	2
22:18	Common pipistrelle	1
22:21	Noctule	1
22:21	Common pipistrelle	3
22:22	Noctule	2
22:23	Noctule	1
22:24	Common pipistrelle	1
22:28	Noctule	1
22:30	Noctule	1
22:30	Common pipistrelle	1
22:39	Common pipistrelle	1
22:54	Common pipistrelle	1
23:09	Common pipistrelle	1

Table 7. Bat passes recorded during the survey (26th July 2011)

Time	Species	Number of bat passes
03:49	Common pipistrelle	2
03:51	Common pipistrelle	1
04:19	Common pipistrelle	4
04:20	Common pipistrelle	2
04:29	Common pipistrelle	1
04:52	Common pipistrelle	1

04:53	Common pipistrelle	1
04:54	Common pipistrelle	1
05:04	Common pipistrelle	1

Species:
Common pipistrelle (*Pipistrellus pipistrellus*)
Noctule (*Nyctalus noctula*)

Botanical species

The botanical survey did not identify any legally protected or notable plant species in the area of the proposed new quarry. Plants identified are described in the relevant habitat descriptions. It is possible that other areas of Yennadown Down do support notable plant species.

Bird species

In total thirty one species of bird were recorded either on site or passing over the site during breeding bird surveys and other incidental records (see Table 8). Eighteen species were either confirmed breeding or considered probably breeding on (or adjacent to) the site. These included four red listed bird species of high conservation concern (linnet *Carduelis cannabina*, skylark *Alauda arvensis*, yellowhammer *Emberiza citrinella*, song thrush *Turdus philomelos*) and four amber listed species of medium conservation concern (dunnock *Prunella modularis*, stonechat *Saxicola torquata*, meadow pipit *Anthus pratensis*, willow warbler *Phylloscopus trochilus*) (Eaton *et al.* 2009).

A single hobby (listed on Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended) was seen flying to the north of the site during another ecological survey in June. This species was not considered to be nesting on site.

Birds recorded were associated with a variety of habitats including woodland to the north of the site, the hedgerow along the western boundary of the site and more open grassland and gorse scrub habitats across Yennadon Down. Those species noted as using the habitat type in the proposed new quarry extension (e.g. acid grassland, bracken and scrub mosaic) are highlighted in bold in the following table.

Table 8. *Bird species recorded during surveys* (PTO)

Common name	Latin name	Conservation status			Status on site[4]	Estimated no. of pairs[5]
		Schedule 1[1]	BOCC[2]	UKBAP[3]		
Hobby*	*Falco subbuteo*	Yes	Green	-	Not breeding	-
Linnet	***Carduelis cannabina***	**-**	**Red**	**Yes**	**Probably breeding**	**3**
Skylark	***Alauda arvensis***	**-**	**Red**	**Yes**	**Probably breeding**	**3**
Yellowhammer	***Emberiza citrinella***	**-**	**Red**	**Yes**	**Probably breeding**	**1**
Song thrush	*Turdus philomelos*	-	Red	Yes	Probably breeding	1
House sparrow	*Passer domesticus*	-	Red	Yes	Possibly breeding	-
Spotted flycatcher*	*Muscicapa striata*	-	Red	Yes	Not breeding	-
Dunnock	*Prunella modularis*	-	Amber	-	Confirmed breeding	2-3
Stonechat	***Saxicola torquata***	**-**	**Amber**	**-**	**Probably breeding**	**4**
Meadow pipit	***Anthus pratensis***	**-**	**Amber**	**-**	**Probably breeding**	**2-3**
Willow Warbler	*Phylloscopus trochilus*	-	Amber	-	Probably breeding	1-2
Swallow	*Hirundo rustica*	-	Amber	-	Not breeding	-
House martin	*Delichon urbica*	-	Amber	-	Not breeding	-
Coal tit	*Periparus ater*	-	Green	-	Confirmed breeding	1
Blackbird	*Turdus merula*	-	Green	-	Probably breeding	2-3
Pied wagtail	*Motacilla alba*	-	Green	-	Probably breeding	2-3
Wren	*Troglodytes troglodytes*	-	Green	-	Probably breeding	2
Chaffinch	*Fringilla coelebs*	-	Green	-	Probably breeding	2
Blue tit	*Cyanistes caeruleus*	-	Green	-	Probably breeding	1-2
Robin	*Erithacus rubecula*	-	Green	-	Probably breeding	1-2
Greenfinch	*Carduelis chloris*	-	Green	-	Probably breeding	1-2
Great tit	*Parus major*	-	Green	-	Probably breeding	1
Chiffchaff	*Phylloscopus collybita*	-	Green	-	Probably breeding	1
Carrion crow	*Corvus corone corone*	-	Green	-	Possibly breeding	-
Goldfinch	*Carduelis*	-	Green	-	Possibly	-

	carduelis				breeding	
Great spotted woodpecker	*Dendrocopos major*	-	Green	-	Possibly breeding	-
Jackdaw	*Corvus monedula*	-	Green	-	Possibly breeding	-
Long-tailed tit	*Aegithalos caudatus*	-	Green	-	Possibly breeding	-
Magpie	*Pica pica*	-	Green	-	Possibly breeding	-
Rook	*Corvus frugilegus*	-	Green	-	Not breeding	-
Woodpigeon	*Columba palumbus*	-	Green	-	Not breeding	-

*Hobby and spotted flycatcher were both incidental results gathered during other ecological surveys undertaken in June 2011. A single hobby was seen flying to the north of the survey area and a spotted flycatcher foraging on the edge of woodland to the north of the site. Neither species is considered to be breeding on site.

Calls of Cuckoo (*Cuculus canorus*) were heard in the distance during the survey undertaken in May towards Burrator reservoir to the east.

[1]Schedule 1: Refers to birds listed on Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended).

[2]BOCC: Refers to Birds of Conservation Concern (2009).

[3]UKBAP: Refers to species listed on the UK Biodiversity Action Plan www.ukbap.org.uk (for selection criteria see Appendix 2).

[4]Status on site: Breeding status on site

Possibly breeding: species seen in suitable habitat.

Probably breeding: species seen in suitable habitat with behaviour suggestive of breeding nearby (e.g. territorial male song, carrying nesting material or food or leaving potential nest site, pair of opposite sex).

Confirmed breeding: Bird on nest or dependant juveniles seen.

[5]Estimated number of pairs: An estimation based on the number of pairs or number of calling males recorded on each survey for species confirmed as breeding or probably breeding on site (- = unconfirmed breeding and numbers).

Butterfly species

Surveys specifically aimed at determining the presence (or likely absence of) high brown fritillary and other fritillaries were undertaken. Food plants of the high brown fritillary (Common dog violets *Viola riviniana*) were identified within the bracken and acid grassland mosaic of the area of proposed new quarry. The frequency of occurrence for violets throughout the site was assessed as being „Occasional".

No caterpillars of the high brown fritillary were identified during the larval survey.

No high brown fritillary (or other legally protected butterfly species) were identified during the transect surveys. Seven species of butterflies were identified during the surveys including individuals or small numbers of speckled wood *Pararge aegeria*, meadow brown *Maniola jurtina*, gatekeeper *Pyronia tithonus*, large white *Pieris brassicae*, small copper *Lycaena phlaeas*, ringlet *Aphantopus hyperantus* and small heath *Coenonympha pamphilus*.

Table 9. Numbers of butterflies recorded during each survey.

Species	Transect survey 1	Transect survey 2	Transect survey 3
Speckled wood (*Pararge aegeria*)	-	1	5
Meadow brown (*Maniola jurtina*)	2	7	1
Gatekeeper (*Pyronia tithonus*)	-	1	-
Large white (*Pieris brassicae*)	-	4	-
Small copper (*Lycaena phlaeas*)	-	1	1
Ringlet (*Aphantopus hyperantus*)	-	1	-
Small heath (*Coenonympha pamphilus*)	-	-	1

Reptile species

Surveys of reptile refugia (tiles) resulted in a single adult male common lizard being identified under a reptile tile on the 13th May 2011. No other reptiles were identified under refugia during the other six surveys.

Walked transect surveys identified individual adult common lizards on two occasions.

Table 10. Reptile refugia survey results

	19/04/11	21/04/11	26/04/11	10/05/11	13/05/11	14/06/11	15/07/11
Common lizard	-	-	-	-	1 adult	-	-

Table 11. Reptile transect survey results

	07/04/11	10/05/11	13/05/11	14/06/11
Common lizard	1 adult	-	-	1 adult

1.4 Assessment of Impact

Statutory Designated Sites

There is one SSSI within 2km of Yennadon Quarry (Burrator Quarries). The site is designated for geological and not ecological importance. No impacts to this site are predicted.

Non-Statutory Designated Sites

There are four County Wildlife Sites (CWS) and two Unconfirmed Wildlife Sites (UWS) within 2km of Yennadon Quarry. No impacts to non-statutory sites are predicted.

Habitats

Hedgerows

The hedgerow to the west of the site and buildings present are not anticipated to be affected by the proposed quarry extension. Therefore they have been omitted from impact assessment.

Unimproved acid grassland, bracken scrub mosaic

Evaluation

The unenclosed and unimproved acid grassland, bracken and scrub mosaic of Yennadon Down comprises part of the Dartmoor Biodiversity Action Plan for „Moorland". It is likely that Yennadon Down was once largely upland heathland (vegetation with greater than 25% heather, bilberry or western gorse) which is undergoing a transition into „grass moor" with frequently occurring European gorse.

Only very small amounts of heather are present and the grassland is not considered particularly botanically valuable (due to the absence of nationally rare or legally protected plant species).

Objective 6 of the Dartmoor Biodiversity Action Plan (2007) aims to reduce the loss of upland heathland to grass moor. This makes Yennadon Down a good candidate area for habitat improvement. This could take the form of a reduction in grazing intensity or re-establishment of plant species such as heather when the quarry restoration takes place.

Despite the continued conversion of this habitat into that of less ecologically valuable „grass moor", Yennadon Down is assessed as being of **district** ecological importance.

Impacts

Extension of Yennadon Quarry will result in the loss of approximately 1.8 ha of unimproved acid grassland, bracken and scrub mosaic. Yennadon Down is part of a complex of open common ground of similar unenclosed unimproved acid grassland totalling approximately 408 ha. The negative impact arising from the loss of 1.8 ha of grassland, bracken and scrub mosaic is considered only significant at the **local** level.

Scattered trees

Evaluation

Small numbers of scattered hawthorn trees (approximately 10) are present in the area of the proposed quarry extension. Hawthorn trees are frequently occurring across the lower and more sheltered areas of Yennadon Quarry, especially alongside the access track. These are assessed as being of **site** interest only.

Impacts

Loss of small numbers of small scattered hawthorn trees is considered adverse and significant at the **site** level.

Quarry

Evaluation

Quarries form part of the Dartmoor Habitat Action Plan for „Rocks". Yennadon Quarry is an active slate quarry with the worked rock faces regularly disturbed due to quarrying activities. The active quarry faces are largely absent of vegetation and the quarry is not identified as an important site for rare or protected plant or animal species. Therefore Yennadon Quarry is only identified as ecologically important at the **site** level.

Impact

Extension of the quarry will include extension to the north and continued working of the northern quarry face. This is anticipated to have a **neutral** ecological impact on the current quarry face.

Protected Species

Badgers

Evaluation

Badgers are protected under the Protection of Badgers Act 1992. This includes protection from being killed, their setts are protected from damage or destruction and badgers are protected from disturbance whilst occupying a sett.

Two badger setts (consisting of one and two entrances respectively) were identified in the hedge bank of the hedgerow to the west of Yennadon Quarry. These setts have shown evidence of current use during the entire survey period and despite its relatively small size it is concluded that the larger sett may be used for breeding and therefore a main sett for badgers.

Badgers are widespread and common in Britain, particularly in the southwest of England. The use of the site by badgers is therefore assessed as being of **local** ecological importance.

Impacts

At present the nearest boundary of the quarry is approximately 80m from the nearest badger sett entrance. The new margin of the extended area of quarry will not encroach within 50m of these sett entrances. The works associated with the extension of the quarry are not anticipated to result in the damage or destruction of badger setts within the hedgerow to the west of the quarry.

As works during quarrying will not encroach on these setts closer than what is experienced at present it is considered unlikely that disturbance to badgers (by noise and vibration) will significantly exceed that which they are currently exposed to.

The loss of approximately 1.0ha of open acid grassland, scattered gorse scrub and bracken is expected to result in a negligible loss of foraging habitat for badgers (as badgers are anticipated to

spend more time foraging alongside the hedgerow, and in improved pastures to the west or in the surrounding woodland).

There is also not anticipated to be an increase in traffic movements to and from the quarry (or increase in traffic after dusk) and therefore potential harm to badgers due to vehicle collision is not expected to increase.

In summary the impact of disturbance and loss of foraging opportunities on badgers is anticipated to be **negligible**.

Bat species

Evaluation

British bat species are protected under the Wildlife and Countryside Act (1981) and Conservation of Habitats and Species Regulations (2010). These make it illegal to kill, disturb or injure a bat, or damage or destroy a roosting site (amongst other things).

No bat roost sites were identified within the quarry. However the quarry and its immediate surrounds are used for foraging by both common pipistrelle and noctule bats. Both of these species are considered widespread and fairly common. The use of the site by bat species is therefore assessed as being of **local** ecological importance.

Impacts

It is not anticipated that works to extend the quarry will harm bats or damage or destroy a roosting site. The loss of approximately 1.0 ha of open acid grassland, scattered gorse scrub and bracken is expected to result in a minimal loss of foraging habitat to bat species in the locality and it is not anticipated to disrupt a well used flight route used by bats. There is no anticipated addition in artificial lighting on site or working at night (with lights) during quarrying activities.

In summary the impact of loss of foraging opportunities for bat species is anticipated to be **negligible**.

Bird species

Evaluation

Bird species are protected under Section 1 of the Wildlife and Countryside Act, 1981 (as amended). This makes it an offence to take, damage or destroy the nests of wild birds whilst being built or in use. Certain species which are listed in Schedule 1 of the Wildlife and Countryside Act (1981) receive special protection. In these cases any form of intentional or reckless disturbance when they are nesting or rearing dependant young, constitutes an offence.

In total eighteen bird species were considered to be breeding or probably breeding within the survey area (which exceeded the area of the proposed quarry extension). This included bird species listed on both the Red and Amber lists of Birds of Conservation Concern (Eaton *et al.* 2009) and listed on the UK Biodiversity Action Plan as priority species. No birds listed on Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended) were recorded as breeding on site.

Using criteria developed by Fuller (1980) and adapted by IEEM, the assemblage of breeding birds on the site is assessed as being of **local** importance.

Impacts

The loss of 1.0 ha of grassland, bracken and scrub mosaic is anticipated to result in the loss of potential nesting habitat for five bird species; linnet, skylark, yellowhammer, stonechat and meadow pipit. Extensive suitable habitat is available for these species beyond the site on Yennadon Down. If works to clear vegetation (including grassland) were to be undertaken during the breeding season then nesting birds or dependant juveniles could be harmed. This would lead to an offence under the Wildlife and Countryside Act (1981). Therefore works to clear vegetation which could be used by birds for nesting is recommended to be removed outside of the nesting season.

In summary the impact of loss of 1.0 ha of potential nesting habitat for five bird species is anticipated to be a negative impact and significant only at the **site** level.

Butterflies

Evaluation

Several butterfly species (including the high brown fritillary) are listed on Schedule 5 of the Wildlife and Countryside Act, 1981 (as amended). Other butterfly species are listed on the UK Biodiversity Action Plan. The principle reason for undertaking butterfly surveys were due to the potential for high brown fritillary butterflies to be present within the area of the proposed quarry extension.

No high brown fritillary (or other legally protected butterfly species) were identified during either the larval survey or transect surveys for adult butterflies. Six widespread and common butterfly species were identified and a single small heath (a UK BAP species) was also identified during a transect survey. The site is assessed as being of **local** ecological importance for butterfly species.

Impacts

The loss of approximately 1.0ha of open acid grassland, scattered gorse scrub and bracken is expected to result in a small loss of habitat for common butterfly species and one UK BAP Species (small heath).

The impact of this loss is anticipated to be significant at the **site** level.

Reptiles

Evaluation

Widespread reptile species (including common lizards) are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are protected from being killed or injured.

Individual common lizards were identified on three occasions. The suitability of habitat throughout the survey area (and beyond the survey area across Yennadon Down) indicates that the site supports a small and widespread population of common lizard. The use of the site by reptile species is assessed as being of **site** importance.

Impacts

The loss of 1.0 ha of grassland, bracken and scrub mosaic is anticipated to result in the loss of a relatively small amount of habitat for common lizards when compared to the total available habitat across Yennadon Down. However works to clear the site have the potential to kill or injure common lizards and therefore have potential to result in an offence under the Wildlife and Countryside Act, 1981 (as amended). Therefore a strategy to protect reptiles during site clearance has been formulated.

In summary the impact of loss of 1.0 ha of habitat suitable for a small population of common lizards is anticipated to be significant at the **site** level.

1.5 Mitigation Strategies

The following mitigation strategies have been developed to avoid any offences under wildlife legislation and reduce impacts to habitats and species identified within the previous section. Measures have also been implemented to enhance the biodiversity value of the site in line with PPS9 (key principle ii) which states "*planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. In taking decisions, local planning authorities should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; and to biodiversity and geological interests within the wider environment".*

Specific details of these measures will be finalised within a specific biodiversity mitigation and enhancement plan.

Site clearance

Site clearance will be undertaken in a manner (and at a time of year) which will avoid harm to nesting birds or reptile species. The works programme will also highlight the location of badger sett entrances and avoid vehicle movement or digging operations within a distance which would either damage a sett or cause disturbance to badgers.

Reptile translocation

Prior to ground works commencing (e.g. turf stripping) a translocation of reptiles will be implemented by a suitably experienced ecologist. A translocation will comprise of setting out of reptile refugia (e.g. tiles) within the areas of work and relocating any reptiles beneath to adjacent habitat. Temporary reptile barrier fencing will be required to prevent recolonisation of the new quarry area prior to works commencing.

Bund creation

A bund will be created along the western edge of the proposed new quarry extension in order to screen quarrying operations. This will be seeded with species-rich locally sourced seed of locally typical grass and flower species suitable for the acidic soil type present. Also dog-violet and heath dog violet seedling plugs can be planted to give larval food plants for fritillary butterflies.

After establishment the bund will be managed in order to create a mosaic of scrub (gorse and/or heather) and more open grassy and flower-rich areas either through light grazing by livestock or seasonal mowing.

Restoration of spoil piles

Long term redundant spoil piles from previous quarrying activities on site will be manipulated to restore the original ground profile. At this time these spoil piles will be capped with locally sourced topsoil and seeded with a seed mix of species-rich locally typical grass and flower species.

After establishment restored spoil piles will be managed to provide a mosaic of habitats including scrub (gorse and/or heather) and more open grassy and flower-rich areas for the benefit of a variety of local species including birds, reptiles and invertebrates including butterflies. In addition dog-violet and heath dog violet seedling plugs can also be planted to give larval food plants for fritillary butterflies.

Tree planting

Ten hawthorn trees will be planted on the newly created bund. These will be planted in a randomised way to give the appearance of scattered and naturally self sown trees, rather than a straight formal line, evenly spaced. Young trees will be protected by tree guards until established to prevent damage by rabbits and livestock.

Creation of two reptile hibernacula on earth bund

Two reptile hibernacula will be constructed on the new earth bund prior to seeding. These will consist of two hibernacula following guidelines on Page 45/46 of the Reptile Habitat Management Book (Amphibian and Reptile Conservation 2010). Hibernacula comprise features of rock and log piles under turf where reptiles can both overwinter and bask on top of.

Provision of nest boxes for bird species

New nesting opportunities will be provided for woodland bird species by the installation of four nest boxes (two robin boxes and two tit boxes) on mature trees within the vicinity of the quarry. Trees alongside the access track offer numerous opportunities to be enhanced for nesting birds.

Provision of bat boxes for bat species

New roosting opportunities will be provided for bat species by the installation of four bat boxes on mature trees within the vicinity of the quarry. Trees alongside the access track offer numerous opportunities to be enhanced for roosting by bat species.

Biological monitoring

A biological monitoring programme should be established to determine the success of establishment of any habitat creation and effects on species groups. It is suggested that monitoring for species, in particular birds and butterflies, and the establishment of planting, is carried out annually for the first 3 years after start of works and alternate years for the next 4 years giving a total of 7 years of monitoring. This is in order to ensure the site mitigation and enhancement measures are establishing correctly and that populations are returning to or increasing from the baseline levels.

1.6 Residual Effects (summary of)

This section describes, assesses and summarises the likely impacts of the quarry extension based on the proposed mitigation, compensation and enhancement measures proposed.

Statutory Designated Sites

There is one SSSI within 2km of Yennadon Quarry (Burrator Quarries). The site is designated for geological and not ecological importance. No impacts to this site are predicted.

Non-Statutory Designated Sites

There are four County Wildlife Sites (CWS) and two Unconfirmed Wildlife Sites (UWS) within 2km of Yennadon Quarry. No impacts to non-statutory sites are predicted.

Habitats

Unimproved acid grassland, bracken scrub mosaic

The negative impact arising from the loss of 1.0 ha of grassland, bracken and scrub mosaic prior to mitigation and compensatory strategies being employed is considered significant at the **local** level.

After restoration of existing spoil piles and creation of a new bund which will be seeded and managed as acid grassland and scrub mosaic with locally typical plant species, it is anticipated that the residual impacts will be adverse and significant at the **site** level in the first 3-4 years. However, post restoration, once the grassland has established, there should be an increase in species which would constitute an ***enhancement*** for biodiversity.

Scattered trees

Loss of small numbers of small scattered hawthorn trees prior to mitigation and compensatory strategies being employed is considered adverse and significant at the **site** level

After compensatory planting of hawthorn trees and measures to ensure their successful establishment are implemented, the long term negative effects are anticipated to be **negligible**.

Quarry

Extension of the quarry will include extension to the north and continued working of the northern quarry face. This is anticipated to have a **neutral** ecological impact both before and after mitigation and compensatory strategies are employed.

Protected Species

Badgers

The impact of disturbance and loss of foraging opportunities on badgers is anticipated to be **negligible** both prior to and after mitigation and compensatory strategies have been employed.

Bat species

The negative impact of loss of foraging opportunities for bat species is anticipated to be **negligible** prior to mitigation and compensatory strategies being employed.

After restoration of existing spoil piles and creation of a new bund which will be seeded and managed as acid grassland and scrub mosaic, it is anticipated that the residual impacts will be **neutral**.

Bird species

The impact of the loss of 1.0 ha of potential nesting habitat for five bird species is anticipated to be significant at the **site** level prior to mitigation and compensatory strategies being employed.

After restoration of existing spoil piles and creation of a new bund which will be seeded and managed as an acid grassland and scrub mosaic, it is anticipated that the residual impacts will be **negligible**.

Butterfly species

The loss of approximately 1.0ha of open acid grassland, scattered gorse scrub and bracken is expected to result in a small loss of habitat for common butterfly species and one UK BAP Species (small heath).The impact of this loss prior to mitigation and compensatory strategies being employed is anticipated to be significant at the **site** level.

After restoration of existing spoil piles and creation of a new bund which will be seeded and managed as a species rich acid grassland and scrub mosaic, it is anticipated that the long term residual impacts will be **positive.**

Reptile species

The impact of the loss of 1.0 ha of habitat suitable for a small population of common lizards (and potential for small numbers of common lizards to be killed) is anticipated to be negative and significant at the **site** level prior to mitigation and compensatory strategies being employed.

After implementation of mitigation and compensatory strategies (including translocation of reptiles from the footprint of the new quarry area; restoration of existing spoil piles; creation of a new bund which will be seeded and managed as acid grassland and scrub mosaic and creation of two new reptile hibernacula on the new earth bund) the residual impacts on reptile species are anticipated to be **negligible** and possibly positive.

Table 12. Assessment of Impacts.

Element	Geographical	Nature of Impact	Duration	Significance	Mitigation
Statutory sites (Burrator Quarries SSSI)	National	None	N/A	N/A	N/A
Non-statutory sites (various)	County	None	N/A	N/A	N/A
Unimproved acid grassland, bracken and scrub mosaic	District to Local	Adverse	Long	Moderate	Managed site restoration to include seeding with local plant species and biological monitoring
Scattered hawthorn trees	Site	Adverse	Long	Moderate	Compensatory planting of tress on new bund and across site during restoration
Quarry	Local / Site	Neutral	Long	Insignificant	Spoil and disused quarry areas to be capped with locally sourced topsoil, seeded with local plant species and monitored
Badgers	Local	Negligible	Long	Insignificant	Avoid vehicle movement or digging operations within a distance that would either damage or disturb badgers
Bat species	Local	Negligible	Long	Insignificant	Four bat boxes to be installed on mature trees in the vicinity
Bird species	Local / Site	Adverse	Long	Moderate	Four nest boxes (2 Robin; 2 tit) to be installed on mature trees in the vicinity. Site clearance to be undertaken at time of year and in a manner to avoid harm to nesting birds.
Butterfly species	Local / Site	Adverse	Long	Moderate	Managed site restoration with local plant species will provide an enhanced habitat
Reptile species	Local / Site	Adverse	Long	Moderate	Reptiles to be translocated prior to site clearance. Two new reptile hibernacula to be created on new bund and during site restoration

Table 13. Summary of residual Effects.

Element	Predicted residual effects	Confidence
Statutory sites (Burrator Quarries SSSI)	None	High
Non-statutory sites (various)	None	High
Unimproved acid grassland, bracken and scrub mosaic	Beneficial*	High
Scattered hawthorn trees	Negligible	High
Quarry	Neutral	High
Badgers	Negligible	High
Bat species	Neutral	High
Bird species	Negligible	High
Butterfly species	Beneficial*	High
Reptile species	Negligible	High

*Once grassland has been established post restoration, there is anticipated to be an increase in species diversity.

Badger Survey Report

Site: Yenndon Quarry

Client: Yennadon Stone Ltd.

Report Date: November 2011

Prepared by	Adam Bratt BSc (Hons), MIEEM
Checked by	Sue Searle BSc (Hons), PGDip (Ecology), MIEEM
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Contents

1. Summary

This is a brief summary of findings and recommendations. Please read the report in its entirety for full details.

- A badger survey report has been compiled due to the presence of badger setts being identified during the Phase 1 habitat survey undertaken in November 2010.
- Two setts (with one and two entrances respectively) are present within a hedge bank to the west of the proposed quarry extension.
- The setts displayed regular use by badgers during the summer of 2011. The proposed quarry extension is not anticipated to damage or destroy a sett, or cause disturbance to badgers significantly above what they experience at present.
- A specific biodiversity mitigation and enhancement plan is recommended to ensure that impacts on badgers are minimised and a verification survey of badger activity is undertaken closer to the time of works commencing.

2. Introduction

This badger report was commissioned by Yennadon Stone Ltd. and surveys for badger (*Meles meles*) undertaken during the summer of 2011 by staff of Acorn Ecology Ltd. These surveys were undertaken after a Phase 1 habitat survey undertaken in November 2010 identified the presence of badgers on site.

The purpose of the survey was to determine how badgers use the site, identify any impacts of the development on badgers and make recommendations for avoidance, mitigation or compensation as appropriate.

2.1 Site Location

The site is located on the edge of Yennadon Down on the south western side of Dartmoor National Park (Grid reference SX 542 687) at a height of approximately 250m above sea level. The village of Dousland is situated less than 500m to the west and Burrator Reservoir is located approximately 1km to the east. The immediate surroundings consist of open down with enclosed fields of pasture within 100m to the west. An area of sessile oak and beech woodland is located approximately 270m to the north.

2.2 Site Description

Yennadon Stone Quarry is an active stone quarry measuring approximately 1.5 ha in area. The quarry is surrounded by unenclosed acid grassland, bracken and scattered gorse scrub.

2.3 Proposed Development

It is proposed that the existing quarry will be extended to the north as shown in Drawing No. FIG2 Rev. P1 and Drawing No.FIG3 Rev. P2 produced by John Grimes Partnership Ltd. The extended area measures approximately 1.0 ha in size.

It is proposed to infill the depleted part of the quarry in a phased manner concurrently with the ongoing excavation. On completion of quarrying operation, it is planned to restore the site to near original ground profile. The restoration will create habitat for local species and will be accessed by National Park visitors.

3. Methods

3.1 Data Search

A data search was undertaken by Devon Biodiversity Records Centre (DBRC) in November 2010. The data search identified records of badgers within a 2km radius of the site (Grid reference SX 542 687).

3.2 Badger Survey

The extended Phase 1 habitat survey undertaken in November 2010 by Adam Bratt BSc (Hons), AIEEM included a survey for signs of badgers. This involved Yennadon Quarry, the area of proposed

quarry extension and the immediate surrounds being surveyed for signs of badgers. Signs of badgers include setts, latrines, foraging signs and hair.

Subsequent periodic surveys for signs of (and activity levels of) badgers were undertaken throughout the period April to August 2011 during other protected species surveys.

4. Survey Results

4.1 Data Search Results

The data search undertaken by the Devon Biodiversity Records Centre (DBRC) identified two records of badger within 2km of the site.

Table 2. Data search results for badgers.

Common name	Latin name	Date	OS Grid Reference	Location	Approximate distance from site
Badger	*Meles meles*	2000	SX527700	Knowle Down, between Horrabridge and Walkhampton.	2km
Badger	*Meles meles*	1999	SX55276742	Burrator Wood, near Meavy.	1.75km south east

4.2 Badger Survey

Two badger setts are present within the hedgerow to the west of Yennadon Quarry. One of these comprises two entrances with the other (located within 15m to the north) comprising of a single entrance. Each sett entrance has an associated spoil pile and well worn path linking them. These sett entrances displayed signs of current use (either fresh digging, smoothed entrances, latrine with faeces or hair on fence nearby) during both November 2010 and during ecological surveys conducted between April and August 2011.

Despite the relatively small size (only two entrances) it is possible that the larger of the two setts represents a main badger sett used for breeding, due to the apparent use in November, and continued use during the period April to August.

Signs of foraging by badgers (or „snuffle holes") were noted close to the sett entrances (within 10m of the hedgerow) during surveys conducted in July 2011.

Two further mammal burrows were identified within (or close to) the area of proposed new quarry extension. Although of a size large enough for a badger to access, these entrances did not display any field signs of badgers during the survey period.

It is considered highly likely that badgers will forage alongside the hedgerow and within surrounding areas of woodland, and may also pass across more open areas of Yennadon Down whilst foraging. No signs of badgers were noted within the area of current active quarry.

A map of survey results for badgers (and photographs of field signs) are shown in Appendix 1.

4.3 Survey Constraints

No constraints were identified whilst undertaking this survey.

5. Evaluation

Please note that all conclusions and recommendations are based upon the current survey findings and on the proposal outlined in 2.3 above. If the site changes then the potential for protected species to use the site may change accordingly.

5.1 Summary of Findings

Two badger setts (consisting of one and two entrances respectively) were identified in the hedge bank of the hedgerow to the west of Yennadon Quarry. These setts have shown evidence of current use during the entire survey period and despite its relatively small size it is concluded that the larger sett may be used for breeding and therefore could be a main sett for badgers.

The amount of spoil associated with the sett entrances indicates that the setts present are small, and likely to be restricted to the hedge bank.

5.2 Summary of Legislation

Badgers are protected under the Protection of Badgers Act 1992. This includes protection from being killed, their setts are protected from damage or destruction and badgers are protected from disturbance whilst occupying a sett (see Section 6 for more details).

5.3 Impacts

5.3.1 During construction phase

Extension of Yennadon Quarry will involve excavation of an area of approximately 1.8 ha of land to the north of the existing quarry. At present the nearest boundary of the quarry is approximately 80m from the nearest badger sett entrance. Drawings provided (and referred to in Section 2.3) show that the new quarry margin will extend northwards and will not encroach within 80m of these sett entrances. Therefore works associated with the extension of the quarry will not result in the damage or destruction of badger setts within the hedgerow to the west of the quarry.

Natural England has given guidance on what constitutes „disturbance‟ to badgers occupying a sett (Natural England 2009a). As works during quarrying will not encroach on these setts closer than what is experienced at present it is considered unlikely that disturbance to badgers (by noise and vibration) will significantly exceed that which they are currently exposed to.

5.3.2 During operational phase

The loss of approximately 1.0ha of open acid grassland, scattered gorse scrub and bracken is expected to result in negligible loss of foraging habitat for badgers (as badgers are anticipated to spend more time foraging in the hedgerow, improved pastures to the west or surrounding woodland).

There is also not anticipated to be an increase in traffic movements to and from the quarry (or increase in traffic after dusk) and therefore potential harm to badgers due to vehicle collision is not expected to increase.

5.4 Avoidance, Mitigation and Enhancement

Planning Policy Statement 9 (PPS9) states that planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. The following measures are aimed at reducing impacts on biodiversity and ensuring long term ecological enhancements as a result of this development (with specific regard for badgers).

Table 3. Measures to avoid and mitigate for adverse impacts to badgers.

Measure	Reason
Undertake a verification survey prior to any works commencing.	To ensure that no new badger setts are present.
Ensure that vehicle movements or excavation works do not take place within 50m of existing badger sett entrances.	To prevent damage to setts or an increase in levels of disturbance to badgers.
Creation of a specific biodiversity mitigation and enhancement strategy. This should include the restoration of acid grassland and scrub mosaic within previously quarried areas on site.	To restore locally typical habitat. This is anticipated to benefit a variety of biodiversity (including foraging opportunities for badgers).

6. Wildlife Legislation and Planning Policy Context

6.1 Badger Species

Badgers are fully protected in the UK by the Protection of Badgers Act, 1992 and by Schedule 6 of the Wildlife and Countryside Act, 1981(as amended). This makes it an offence to:

- Willfully kill, injure, take, possess or cruelly treat a badger
- Intentionally or recklessly damage, destroy or obstruct access to a badger sett.
- Disturb a badger while it is occupying a sett.

Natural England have produced two documents “Guidance on 'Current Use' in the definition of a badger sett” and “Interpretation of 'Disturbance' in relation to badgers occupying a sett”. These documents are useful in determining when an offence in relation to be badgers is reasonably likely to occur, and has been used in the preparation of this report.

6.2 Planning Policy Statement 9

Planning Policy Statement 9 (PPS9) sets out national planning policies on the protection of biodiversity and geological conservation. Circular 06/05 (DEFRA 01/05): Biodiversity and Geological Conservation: Statutory Obligations and Their Impact within The Planning System provides administrative guidance on application of the law in England relating to planning and nature conservation. Para 98 states „The presence of protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. … They should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species … For European protected species further strict provisions apply … to which the planning authorities must have regard."

Key principles of PPS9

Regional planning bodies and local planning authorities should adhere to the following key principles to ensure that the potential impacts of planning decisions on biodiversity and geological conservation are fully considered.

i. Development plan policies and planning decisions should be based upon up-to-date information about the environmental characteristics of their areas. These characteristics should include the relevant biodiversity and geological resources of the area. In reviewing environmental characteristics local authorities should assess the potential to sustain and enhance those resources.

ii. Plan policies and planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. In taking decisions, **local planning authorities should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; and to biodiversity and geological interests within the wider environment.**

iii. Plan policies on the form and location of development should take a strategic approach to the conservation, enhancement and restoration of biodiversity and geology, and recognise the contributions that sites, areas and features, both individually and in combination, make to conserving these resources.

iv. Plan policies should promote opportunities for the incorporation of beneficial biodiversity and geological features within the design of development.

v. Development proposals where the principal objective is to **conserve or enhance biodiversity** and geological conservation interests should be permitted.

vi. The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests. Where granting planning permission would result in significant harm to those interests, local planning authorities will need to be satisfied that the development cannot reasonably be located on any alternative sites that would result in less or no harm. In the absence of any such alternatives, local planning authorities should ensure that, before planning permission is granted, adequate mitigation measures are put in place. Where a planning decision would result in significant harm to biodiversity and geological interests which cannot be prevented or adequately mitigated against, appropriate compensation measures should be sought. If that significant harm cannot be prevented,

adequately mitigated against, or compensated for, then planning permission should be refused.

7. References

Natural England (2009a) Interpretation of „Disturbance" in relation to badgers occupying a sett. Natural England.

Natural England (2009b) Guidance on „Current Use" in the definition of a Badger Sett. Natural England.

8. Appendices

Appendix 1. Badger Survey Results

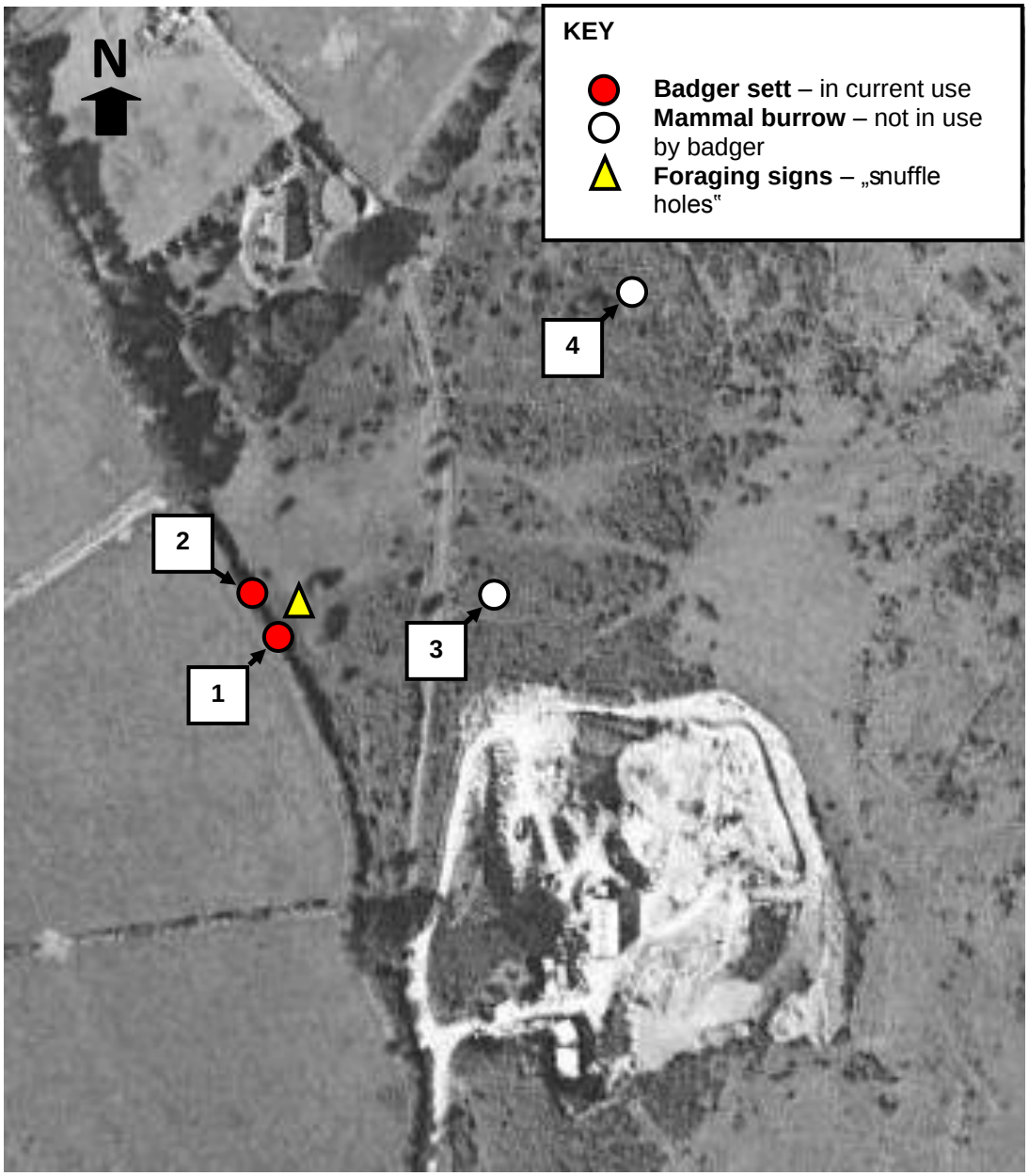

Figure 1. Site plan with badger survey results shown.

Table 4. Descriptions of setts/ mammal burrows (from Figure 1).

Reference number	Description
1	Badger sett. Two entrances. Signs of being in current use by badgers throughout the period April-Aug 2011. Latrine close by at base of hedge bank.
2	Badger sett. Single entrance. Signs of being in current use by badgers throughout the period April-Aug 2011.
3	Mammal burrow. No signs of use by badgers during period April-Aug 2011.
4	Mammal burrow. No signs of use by badgers during period April-Aug 2011.

Photo 1. Sett entrances relating to ref no.1

Photo 2. Sett entrance relating to ref no.2

Photo 3. Foraging marks made by badgers

Photo 4. Mammal burrow relating to ref no.3

Bat Survey Report

Site: Yenndon Quarry

Client: Yennadon Stone Ltd.

Report Date: November 2011

Prepared by	Adam Bratt BSc (Hons), MIEEM
Checked by	Sue Searle BSc (Hons), PGDip (Ecology), MIEEM
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Contents

1. Summary

This is a brief summary of findings and recommendations. Please read the report in its entirety for full details.

- Surveys for bat species were undertaken during the summer of 2011 in order to determine whether a roost site would be affected by the proposed quarry extension.
- No roost site for bats was identified within the quarry and works can proceed without the need for a European Protected Species Licence. Two bat species (Common pipistrelle *Pipistrellus pipistrellus* and Noctule *Nyctalus noctula*) were recorded flying through or foraging within the site.
- A specific biodiversity mitigation and enhancement plan is recommended to ensure that impacts on bat species are minimised and long term ecological enhancements are gained.

2. Introduction

This bat survey report was commissioned by Yennadon Stone Ltd. and surveys for bat species undertaken during the summer of 2011 by staff of Acorn Ecology Ltd. These surveys were undertaken after a Phase 1 habitat survey undertaken in November 2010 highlighted the potential for bat species to roost within the quarry on site.

The purpose of the survey was to assess the use of the site by bats, identify any impacts of the development on bat species and recommendations for avoidance, mitigation or compensation as appropriate.

2.1 Site Location

The site is located on the edge of Yennadon Down on the south western side of Dartmoor National Park (Grid reference SX 542 687) at a height of approximately 250m above sea level. The village of Dousland is situated less than 500m to the west and Burrator Reservoir is located approximately 1km to the east. The immediate surroundings consist of open down with enclosed fields of pasture within 100m to the west. An area of sessile oak and beech woodland is located approximately 270m to the north.

2.2 Site Description

Yennadon Stone Quarry is an active stone quarry measuring approximately 1.5 ha in area. The quarry is surrounded by unenclosed acid grassland, bracken and scattered gorse scrub.

2.3 Proposed Development

It is proposed that the existing quarry will be extended to the north as shown in Drawing No. FIG2 Rev. P1 and Drawing No.FIG3 Rev. P2 produced by John Grimes Partnership Ltd. The extended area measures approximately 1.0 ha in size.

It is proposed to infill the depleted part of the quarry in a phased manner concurrently with the ongoing excavation. On completion of quarrying operation, it is planned to restore the site to near original ground profile. The restoration will create habitat for local species and will be accessed by National Park visitors.

3. Methods

3.1 Data Search

A data search was undertaken by Devon Biodiversity Records Centre (DBRC) in November 2010. The data search identified all records of bat species within a 4km radius of the site (Grid reference SX 542 687).

3.2 Bat Activity Surveys

3.2.1 Transect surveys

Two bat activity surveys were conducted following guidance given in *Bat Surveys Good Practice Guidelines* (2007) produced by the Bat Conservation Trust. One survey was conducted at dusk (aimed at identifying bats emerging from day time roosting sites) and one at dawn (aimed at identifying bats returning to day time roosting sites).

Each survey comprised of one pair of surveyors (equipped with Duet and Anabat SD1/SD2 bat detectors) undertaking a walked transect within the site, aimed at identifying potential roost sites Stopping locations were used to view areas of the quarry where bats could potentially roost. Surveyors stopped at these locations for periods in excess of five minutes (transects and stopping locations can be seen in map in Appendix 1).

Table 1. Survey 1 details (dusk)

Survey Date	16th June 2011
Lead Ecologist	Sarah Candlin BSc (Hons), AIEEM NE Bat Survey Licence 20112238
Assistant	Charlotte Bellamy BSc (Hons)
Time of sunset	21:30
Start time	21:20
Finish time	23:25
Weather conditions	12°C, 45% cloud cover, wind force 2/3, dry

Table 2. Survey 2 details (dawn)

Survey Date	26th July 2011
Lead Ecologist	Adam Bratt BSc (Hons), AIEEM NE Bat Survey Licence 20103604
Assistant	Ele Cooper BSc (Hons), MSc
Time of sunrise	05:32
Start time	03:45
Finish time	05:30
Weather conditions	14°C, 80% cloud cover, wind force 2/3, dry

3.2.2 Echolocation call analysis

Calls recorded on Anabat SD1/SD2 bat detectors were analysed using Analook software on Microsoft Windows. Identification of bat species from echolocation calls was undertaken by comparison of sonograms with a known reference of echolocation call parameters and library of echolocation calls.

Identification to species level was made where possible. Where this was ambiguous, calls were identified to genus level.

4. Survey Results

4.1 Data Search Results

The data search undertaken by the Devon Biodiversity Records Centre (DBRC) identified twenty four records of bats within 4km of the site.

Table 3. Data search results for bat species.

Common name	Latin name	Date	OS Grid Reference	Location	Approximate Distance From Site
Common pipistrelle	*Pipistrellus pipistrellus*	2001	SX552685	Burrator Lodge.	1km east
Pipistrelle	*Pipistrellus pipistrellus*	2003	SX503678	Black Lion Cottage, The Glade, Crapstone, Yelverton.	4km west
Pipistrelle	*Pipistrellus pipistrellus*	2003	SX503678	Black Lion Cottage, The Glade, Crapstone, Yelverton.	4km west
Pipistrelle	*Pipistrellus pipistrellus*	2004	SX529661	Hoo Meavy Farm, Hoo Meavy, Nr Yelverton, Plymouth.	3km south south-west
Pipistrelle	*Pipistrellus pipistrellus*	2004	SX543717	Furzetor, Sampford Spiney, Tavistock.	3km north
Noctule	*Nyctalus noctula*	2007	SX543722	Ward Bridge near Sampford Spiney.	3.5km north
Lesser horseshoe bat	*Rhinolophus hipposideros*	2007	SX509699	Copperfields, Horrabridge, Yelverton (garage).	3.5km west north-west
Brown long-eared bat	*Plecotus auritus*	2007	SX510702	Copperfields, Horrabridge, Yelverton (garage).	3.5km west north-west
Brown long-eared bat	*Plecotus auritus*	2007	SX525710	Brook House, Sampford Spiney, nr Yelverton.	3km north west
Brown long-eared bat	*Plecotus auritus*	2004	SX529661	Hoo Meavy Farm, Hoo Meavy, Nr Yelverton, Plymouth.	3km south south-west
Brown long-eared bat	*Plecotus auritus*	2001	SX552685	Burrator Lodge.	1km east
A bat	*Chiroptera*	1991	SX506681	Tamar House, Crapstone, Yelverton.	3.5km west south-west
A bat	*Chiroptera*	1994	SX514665	Yelverton Golf Club, Golf Links Road, Yelverton.	3.5km south west
A bat	*Chiroptera*	2007	SX521655	Rosehill, Clearbrook, Yelverton.	3.75 south south-west

A bat	*Chiroptera*	1996	SX525656	Underwood, Clearbrook, Yelverton.	3.5 south south-west
A bat	*Chiroptera*	1994	SX525680	Barrycott, Binkham Hill, Yelverton.	2km south west
A bat	*Chiroptera*	1996	SX525710	Brook House, Sampford Spiney, Yelverton.	3km north west
A bat	*Chiroptera*	1992	SX529660	Hoo Meavy Farm, Yelverton (house).	3km south south-west
A bat	*Chiroptera*	1994	SX531715	Stourtown Cottage, Sampford Spiney, Yelverton.	3km north north-west
A bat	*Chiroptera*	1997	SX537723	Stoney Croft, Sampford Spiney, Yelverton.	3.5km north north-west
A bat	*Chiroptera*	1994	SX538679	South Lake House, Dousland, Yelverton, Tavistock.	1.5km south west
A bat	*Chiroptera*	1999	SX538684	Yennadon Lodge, Burrator Road, Dousland, Yelverton.	1km west south-west
A bat	*Chiroptera*	2005	SX542692	Te Ware House, Dousland, Yelverton.	0.5km north
A bat	*Chiroptera*	1994	SX562676	Lambs Park, Sheepstor, Yelverton.	2.5km south east

4.2 Bat Activity Survey Results

Bat survey data (number of bat passes throughout the survey periods) is shown in Appendix 2.

4.2.1 Survey 1 (16th June 2011)

No bats were observed emerging from possible roosting sites such as trees and quarry faces within the survey area. Bat species recorded during the survey included common pipistrelle (*Pipistrellus pipistrellus*) and noctule (*Nyctalus noctula*) bats.

4.2.2 Survey 2 (26th July 2011)

No bats were observed re-entering possible roosting sites within the survey area. Only passes by common pipistrelle bats were recorded during the survey.

4.3 Survey Constraints

Surveys were carried out during an optimal time of year and suitable weather conditions.

5. Evaluation

Please note that all conclusions and recommendations are based upon the current survey findings and on the proposal outlined in 2.3 above. If the site changes then the potential for protected species to use the site may change accordingly. Bat species are highly mobile and re survey of the site may be necessary in the future.

5.1 Summary of Findings

No bat roost sites were identified within the quarry. The survey information shows that the quarry and the immediate surrounds are used for foraging by both common pipistrelle and noctule bats.

5.2 Summary of Legislation

British bat species are protected under the Wildlife and Countryside Act (1981) and Conservation of Habitats and Species Regulations (2010). These make it illegal to kill or injury a bat, or damage or destroy a roosting site amongst other things (see section 6 for more details).

5.3 Impacts

5.3.1 During construction phase

It is not anticipated that a bat roost site will be impacted by the proposed extension of the existing quarry and it is not anticipated that works would harm bats or damage or destroy a roosting site. Therefore the works can proceed without the requirement of a European Protected Species Licence (EPSL).

5.3.2 During operational phase

The loss of approximately 1.0 ha of open acid grassland, scattered gorse scrub and bracken is expected to result in a minimal loss of foraging habitat to bat species in the locality.

However the proposed restoration of existing spoil piles for the benefit of biodiversity is anticipated to mitigate for this loss of this habitat in the long term. A specific biodiversity mitigation and enhancement strategy will ensure this.

5.4 Avoidance, Mitigation and Enhancement

Planning Policy Statement 9 (PPS9) states that planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. The following measures are aimed at reducing impacts on biodiversity and ensuring long term ecological enhancements as a result of this development (with specific regard for bat species).

Table 4. Measures to avoid and mitigate for adverse impacts, and enhance the site for bat species.

Measure	Reason
Avoidance of any works (both during construction of operational phases) between sunset and sunrise during the period April to end of October which would increase artificial lighting on site.	To avoid disturbance of bat species which are sensitive to artificial lighting.
Install two Schwegler 2F and one Schwegler 2FN bat boxes on suitable mature trees bordering the site to the north of the new quarry extension.	To provide new roosting opportunities for pipistrelle and noctule bat species which have been recorded foraging on the site.
Creation of a specific biodiversity mitigation and enhancement strategy. This should include the restoration of acid grassland and scrub mosaic within previously quarried areas on site.	To restore locally typical habitat. This is anticipated to benefit a variety of biodiversity (including bat species).

6. Wildlife Legislation and Planning Policy Context

6.1 European Protected Species

The Bern Convention (The Convention on the conservation of European Wildlife and Natural Habitats) was adopted in 1979 and came into force in 1982. To implement this agreement, the European Community adopted the EC Habitats Directive.

The EC habitats directive has been transposed into UK legislation by the Wildlife and Countryside Act, 1981 (as amended) and the Conservation of Habitats and Species Regulations, 2010. The Countryside and Rights of Way Act (CRoW), 2000 strengthened the existing wildlife legislation in the UK.

The UK has also signed The Bonn Convention (The Convention on the Conservation of Migratory Species of Wild Animals) and is therefore party to various agreements.

6.1.1 Bats

All 17 species of bats are protected under Schedules 5 and 6 of the Wildlife and Countryside Act 1981(and as amended) and are also protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2010. They are listed under Appendix III of the Bern Convention and Annex IV of the EC Habitats Directive. Bats and their habitats are also listed under Appendix II of The Bonn Convention and therefore the UK has an obligation to protect their habitat, including links to important feeding areas.

6.2 Legislation Relating to European Protected Species

In relation to a development a person commits an offence if they—

- Deliberately captures, injures or kills a European Protected Species
- Deliberately or recklessly disturbs wild animals of any such species in such a way as to be likely significantly to affect:
  - (i) the ability of any significant group of animals to survive, breed, or rear or nurture their young; or
  - (ii) the local distribution or abundance of that species;
- Damages or destroys a breeding site or resting place (even if unintentional or when the animal is not present)
- Intentionally or recklessly obstructs access to a structure or place used for protection or shelter
- This legislation applies, regardless of the life stage (including eggs).

A European Protected Species Licence is required to carry out any activity that would otherwise involve committing an offence.

6.3 Planning Policy Statement 9

Planning Policy Statement 9 (PPS9) sets out national planning policies on the protection of biodiversity and geological conservation. Circular 06/05 (DEFRA 01/05): Biodiversity and Geological Conservation: Statutory Obligations and Their Impact within The Planning System provides administrative guidance on application of the law in England relating to planning and nature conservation. Para 98 states 'The presence of protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. … They should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species … For European protected species further strict provisions apply … to which the planning authorities must have regard.'

Key principles of PPS9

Regional planning bodies and local planning authorities should adhere to the following key principles to ensure that the potential impacts of planning decisions on biodiversity and geological conservation are fully considered.

i. Development plan policies and planning decisions should be based upon up-to-date information about the environmental characteristics of their areas. These characteristics should include the relevant biodiversity and geological resources of the area. In reviewing environmental characteristics local authorities should assess the potential to sustain and enhance those resources.

ii. Plan policies and planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. In taking decisions, **local planning authorities should ensure that appropriate weight is attached to designated sites of**

international, national and local importance; protected species; and to biodiversity and geological interests within the wider environment.

iii. Plan policies on the form and location of development should take a strategic approach to the conservation, enhancement and restoration of biodiversity and geology, and recognise the contributions that sites, areas and features, both individually and in combination, make to conserving these resources.

iv. Plan policies should promote opportunities for the incorporation of beneficial biodiversity and geological features within the design of development.

v. Development proposals where the principal objective is to **conserve or enhance biodiversity** and geological conservation interests should be permitted.

vi. The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests. Where granting planning permission would result in significant harm to those interests, local planning authorities will need to be satisfied that the development cannot reasonably be located on any alternative sites that would result in less or no harm. In the absence of any such alternatives, local planning authorities should ensure that, before planning permission is granted, adequate mitigation measures are put in place. Where a planning decision would result in significant harm to biodiversity and geological interests which cannot be prevented or adequately mitigated against, appropriate compensation measures should be sought. If that significant harm cannot be prevented, adequately mitigated against, or compensated for, then planning permission should be refused.

7. References

Bat Conservation Trust (2007) *Bat Surveys- Good Practice Guidelines.* Bat Conservation Trust, London.

8. Appendices

Appendix 1. Bat Survey Routes

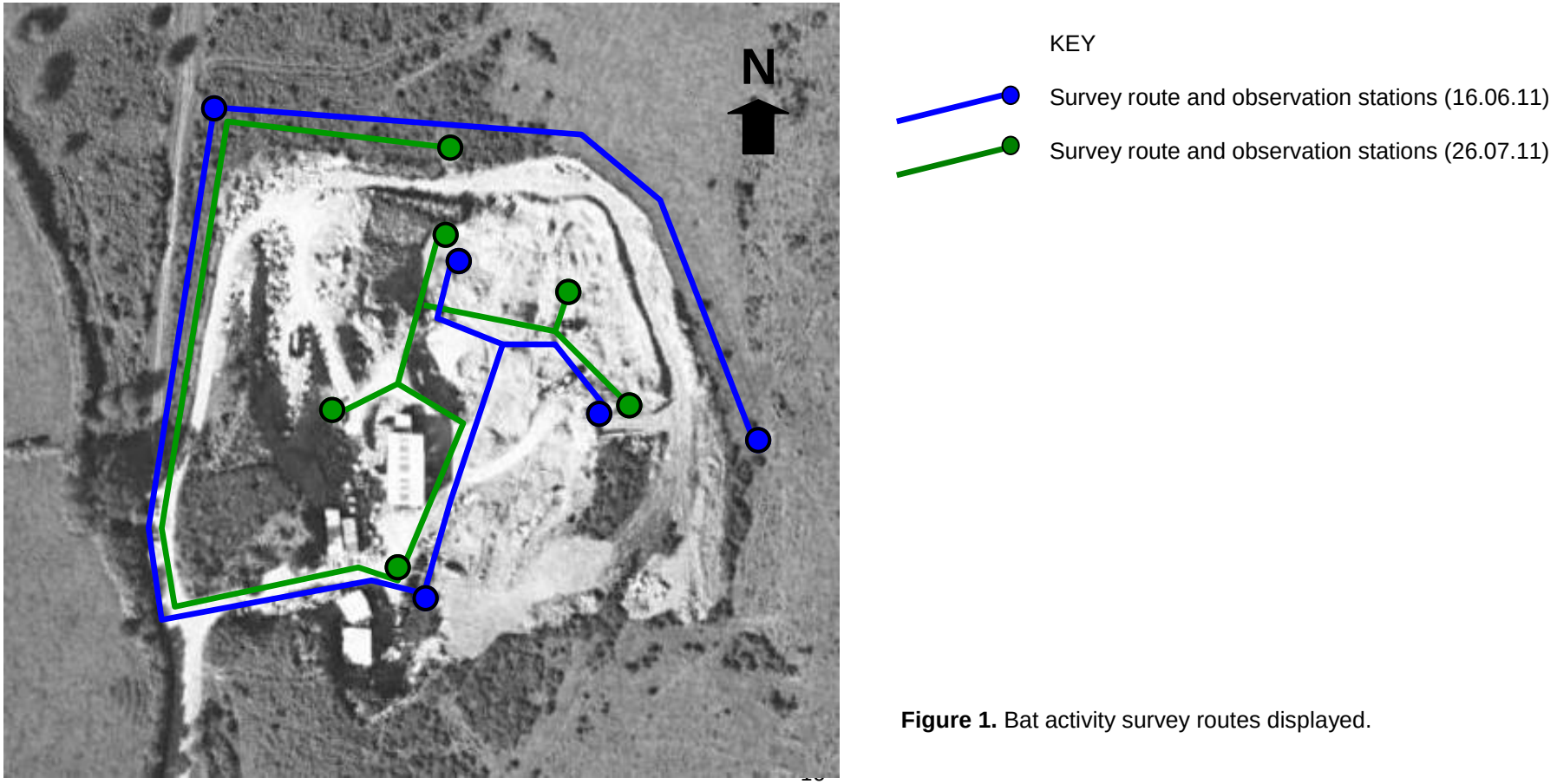

Figure 1. Bat activity survey routes displayed.

Appendix 2. Bat Survey Results

Bat passes recorded during bat activity surveys. Analysis of species undertaken using the Analook software package. Note: 'Number of bat passes' gives an index of bat activity and does not equate to number of bats encountered.

Table 5. Bat passes recorded during the survey (16th June 2011)

Time	Species	Number of bat passes
21:53	Common pipistrelle	1
21:54	Common pipistrelle	4
21.55	Common pipistrelle	4
21:56	Common pipistrelle	3
21:57	Common pipistrelle	4
21:58	Common pipistrelle	4
21:59	Common pipistrelle	4
22:00	Common pipistrelle	3
22:01	Common pipistrelle	4
22:02	Common pipistrelle	4
22:03	Common pipistrelle	4
22:04	Common pipistrelle	4
22:05	Common pipistrelle	2
22:06	Common pipistrelle	4
22:07	Common pipistrelle	4
22:08	Common pipistrelle	4
22:09	Common pipistrelle	2
22:10	Common pipistrelle	1
22:11	Noctule	1
22:13	Common pipistrelle	1
22:15	Noctule	4
22:16	Noctule	3
22:18	Noctule	2
22:18	Common pipistrelle	1
22:21	Noctule	1
22:21	Common pipistrelle	3
22:22	Noctule	2
22:23	Noctule	1
22:24	Common pipistrelle	1
22:28	Noctule	1
22:30	Noctule	1
22:30	Common pipistrelle	1
22:39	Common pipistrelle	1
22:54	Common pipistrelle	1
23:09	Common pipistrelle	1

Species:
Common pipistrelle (*Pipistrellus pipistrellus*)
Noctule (*Nyctalus noctula*)

Table 6. Bat passes recorded during the survey (26th July 2011)

Time	Species	Number of bat passes
03:49	Common pipistrelle	2
03:51	Common pipistrelle	1
04:19	Common pipistrelle	4
04:20	Common pipistrelle	2
04:29	Common pipistrelle	1
04:52	Common pipistrelle	1
04:53	Common pipistrelle	1
04:54	Common pipistrelle	1
05:04	Common pipistrelle	1

Species:
Common pipistrelle (*Pipistrellus pipistrellus*)

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Breeding Bird Survey Report

Site: Yenndon Quarry

Client: Yennadon Stone Ltd.

Report Date: November 2011

Prepared by	Adam Bratt BSc (Hons), MIEEM
Checked by	Sue Searle BSc (Hons), PGDip (Ecology), MIEEM
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IEEM Member subject to the Code of Professional Conduct.

Contents

1. Summary

This is a brief summary of findings and recommendations. Please read the report in its entirety for full details.

- Breeding bird surveys were undertaken during the spring and summer of 2011 in order to determine the breeding bird assemblage within the surrounding area and more specifically the area of proposed quarry extension.
- In total eighteen bird species were considered as confirmed or probably breeding within the survey area. Habitat within the proposed quarry extension is considered likely to be used by five of these species (linnet, skylark, yellowhammer, stonechat and meadow pipit).
- A specific biodiversity mitigation and enhancement plan is recommended to ensure that clearance of the site does not harm nesting birds and long term impacts on bird species are minimised by a process of habitat restoration of existing spoil piles.

2. Introduction

This breeding bird survey report was commissioned by Yennadon Stone Ltd. and surveys for bird species undertaken during the summer of 2011 by staff of Acorn Ecology Ltd. These surveys were undertaken after a Phase 1 habitat survey undertaken in November 2010 highlighted the potential for a variety of bird species to use the site for breeding.

The purpose of the survey was to record the bird species present, their conservation status, distribution and breeding status on site. This report also aims to determine potential impacts of the development on bird species and make recommendations for avoidance, mitigation or compensation as appropriate.

2.1 Site Location

The site is located on the edge of Yennadon Down on the south western side of Dartmoor National Park (Grid reference SX 542 687) at a height of approximately 250m above sea level. The village of Dousland is situated less than 500m to the west and Burrator Reservoir is located approximately 1km to the east. The immediate surroundings consist of open down with enclosed fields of pasture within 100m to the west. An area of sessile oak and beech woodland is located approximately 270m to the north.

2.2 Site Description

Yennadon Stone Quarry is an active stone quarry measuring approximately 1.5 ha in area. The quarry is surrounded by unenclosed acid grassland, bracken and scattered gorse scrub.

2.3 Proposed Development

It is proposed that the existing quarry will be extended to the north as shown in Drawing No. FIG2 Rev. P1 and Drawing No.FIG3 Rev. P2 produced by John Grimes Partnership Ltd. The extended area measures approximately 1.0 ha in size.

It is proposed to infill the depleted part of the quarry in a phased manner concurrently with the ongoing excavation. On completion of quarrying operation, it is planned to restore the site to near original ground profile. The restoration will create habitat for local species and will be accessed by National Park visitors.

3. Methods

3.1 Data Search

A data search was undertaken by Devon Biodiversity Records Centre (DBRC) in November 2010. The data search identified records of legally protected and notable bird species within a 2km radius of the site (Grid reference SX 542 687).

This includes species listed on Schedule 1 of the Wildlife and Countryside Act (1981) as amended, UK and Devon Biodiversity Action Plan (UK BAP and Devon BAP) species and birds listed either on either the red or amber lists of Birds of Conservation Concern (BOCC) (Eaton *et al.* 2009).

3.2 Breeding Bird Survey

The area surveyed comprised the existing boundaries of the quarry, the area of proposed new quarrying activities to the north and the immediate surroundings (extending to approximately 200m radius of the centre of the existing quarry).

The site was visited on three occasions between April and June 2011 to record bird species present. The method employed was broadly similar to that of the British Trust for Ornithology's (BTO) Common Bird Census.

Surveys commenced within approximately one hour of sunrise and lasted for approximately between one and a half and two hours. A transect was walked within the site to incorporate features which may be used by birds. Birds were identified by either visual sightings or from their calls and/or song. Locations of birds and their activity were recorded onto a map of the site using standard BTO species codes. Care was taken to not record the same bird twice on each survey. Activity maps, codes and their descriptions are given in Appendix 2.

The records gained from the three survey visits were used to determine the status of each species on site. Status was assigned based on criteria formulated by the European Ornithological Atlas Committee (EOAC 1979). This assigned each species a category of either 'possibly breeding' (species seen in suitable habitat), 'probably breeding' (species seen in suitable habitat with behaviour suggestive of breeding nearby (e.g. territorial male song, carrying nesting material or food or leaving potential nest site)) or 'confirmed breeding' (bird on nest or dependant juveniles seen). Birds not considered likely to be breeding on site were assigned the category 'not breeding' (e.g. in unsuitable habitat, seen flying over the site or individuals likely to be on passage).

Using information gained from the three surveys an estimate of the number of pairs of probable or confirmed breeding species was made based on the number of singing/ calling males or territories held.

Incidental records of birds seen on other occasions (during other ecological surveys) were included for species not recorded during the standard breeding bird surveys. Although no specific evening bird survey was undertaken for species more conspicuous at dusk (e.g. nightjar, *Caprimulgus europaeus*) a bat survey undertaken at dusk on the 16th June 2011 is expected to have identified obvious signs of such species.

An assessment of likely impacts as a result of the development has been made for those species listed as confirmed or probably breeding within the survey area.

Table 1. Survey details

Survey date	Surveyor*	Sunrise time	Start time	Finish time	Weather conditions
07.04.11	AB	06:30	06:20	08:20	10°C, dry, <10% cloud cover, wind force 0-1, dry
13.05.11	AB	05:30	05:30	07:45	8°C, dry, 10% cloud cover, wind force 1-2, dry
14.06.11	AB	05:03	06:15	07:45	8°C, dry, 10% cloud cover, wind force 0-1, dry

*AB Adam Bratt BSc (Hons), AIEEM

4. Survey Results

4.1 Data Search Results

The data search undertaken by the Devon Biodiversity Records Centre (DBRC) identified a single record of a black redstart (*Phoenicurus ochruros*) within 2km of the site.

Table 2. Data search results for bird species (source: Devon Biodiversity Records Centre).

Common name	Latin name	Conservation status		Approximate distance to site
		Schedule 1[1]	BOCC[2]	
Black redstart	*Phoenicurus ochruros*	Yes	Amber	1.5km South east

[1]Schedule 1: Refers to Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).
[2]BOCC: Refers to Birds of Conservation Concern (2009).
The absence of records for this site is likely to be due to the lack of survey effort or non-submission of records.

4.2 Breeding Bird Survey Results

4.2.1 Bird species present

In total thirty one species of bird were recorded either on site or passing over the site during breeding bird surveys and other incidental records (see Table 3). Eighteen species were either confirmed breeding or considered probably breeding on (or adjacent to the) site. These included four red listed bird species of conservation concern (linnet, skylark, yellowhammer, song thrush) and four amber listed species (dunnock, stonechat, meadow pipit, willow warbler) (Eaton *et al.* 2009).

A single hobby (listed on Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended)) was seen flying to the north of the site during another ecological survey in June. This species was not considered to be nesting on site.

Birds recorded were associated with a variety of habitats including woodland to the north of the site, the hedgerow along the western boundary of the site and more open grassland and gorse scrub habitats across Yennadon Down.

4.2.2 Status of bird species on site

The following table shows the estimated number of pairs recorded on the site, their conservation status and probable breeding status:

Table 3. *Bird species recorded during surveys*

Common name	Latin name	Conservation status			Status on site[4]	Estimated no. of pairs[5]
		Schedule 1[1]	BOCC[2]	UKBAP[3]		
Hobby*	*Falco subbuteo*	Yes	Green	-	Not breeding	-
Linnet	*Carduelis cannabina*	-	Red	Yes	Probably breeding	3
Skylark	*Alauda arvensis*	-	Red	Yes	Probably breeding	3
Yellowhammer	*Emberiza citrinella*	-	Red	Yes	Probably breeding	1
Song thrush	*Turdus philomelos*	-	Red	Yes	Probably breeding	1
House sparrow	*Passer domesticus*	-	Red	Yes	Possibly breeding	-
Spotted flycatcher*	*Muscicapa striata*	-	Red	Yes	Not breeding	-
Dunnock	*Prunella modularis*	-	Amber	-	Confirmed breeding	2-3
Stonechat	*Saxicola torquata*	-	Amber	-	Probably breeding	4
Meadow pipit	*Anthus pratensis*	-	Amber	-	Probably breeding	2-3
Willow Warbler	*Phylloscopus trochilus*	-	Amber	-	Probably breeding	1-2
Swallow	*Hirundo rustica*	-	Amber	-	Not breeding	-
House martin	*Delichon urbica*	-	Amber	-	Not breeding	-
Coal tit	*Periparus ater*	-	Green	-	Confirmed breeding	1
Blackbird	*Turdus merula*	-	Green	-	Probably breeding	2-3
Pied wagtail	*Motacilla alba*	-	Green	-	Probably breeding	2-3
Wren	*Troglodytes troglodytes*	-	Green	-	Probably breeding	2
Chaffinch	*Fringilla coelebs*	-	Green	-	Probably breeding	2
Blue tit	*Cyanistes caeruleus*	-	Green	-	Probably breeding	1-2
Robin	*Erithacus rubecula*	-	Green	-	Probably breeding	1-2
Greenfinch	*Carduelis chloris*	-	Green	-	Probably breeding	1-2

Great tit	*Parus major*	-	Green	-	Probably breeding	1
Chiffchaff	*Phylloscopus collybita*	-	Green	-	Probably breeding	1
Carrion crow	*Corvus corone corone*	-	Green	-	Possibly breeding	-
Goldfinch	*Carduelis carduelis*	-	Green	-	Possibly breeding	-
Great spotted woodpecker	*Dendrocopos major*	-	Green	-	Possibly breeding	-
Jackdaw	*Corvus monedula*	-	Green	-	Possibly breeding	-
Long-tailed tit	*Aegithalos caudatus*	-	Green	-	Possibly breeding	-
Magpie	*Pica pica*	-	Green	-	Possibly breeding	-
Rook	*Corvus frugilegus*	-	Green	-	Not breeding	-
Woodpigeon	*Columba palumbus*	-	Green	-	Not breeding	-

*Hobby and spotted flycatcher were both incidental results gathered during other ecological surveys undertaken in June 2011. A single hobby was seen flying to the north of the survey area and a spotted flycatcher foraging on the edge of woodland to the north of the site. Neither species is considered to be breeding on site.

Calls of Cuckoo (*Cuculus canorus*) were heard in the distance during the survey undertaken in May towards Burrator reservoir to the east.

[1]Schedule 1: Refers to birds listed on Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended).

[2]BOCC: Refers to Birds of Conservation Concern (2009).

[3]UKBAP: Refers to species listed on the UK Biodiversity Action Plan www.ukbap.org.uk (for selection criteria see Appendix 2).

[4]Status on site: Breeding status on site

Possibly breeding: species seen in suitable habitat.

Probably breeding: species seen in suitable habitat with behaviour suggestive of breeding nearby (e.g. territorial male song, carrying nesting material or food or leaving potential nest site, pair of opposite sex).

Confirmed breeding: Bird on nest or dependant juveniles seen.

The site comprises the entire survey area and not just the area of proposed quarry extension. For anticipated impacts on each species comfirmed or considered probably breeding on site see Table 5.

[5]Estimated number of pairs: An estimation based on the number of pairs or number of calling males recorded on each survey for species confirmed as breeding or probably breeding on site (- = unconfirmed breeding and numbers).

4.3 Survey Constraints

Surveys were carried out during optimal times of year and suitable weather conditions. No constraints were identified.

5. Evaluation

Please note that all conclusions and recommendations are based upon the current survey findings and on the proposal outlined in 2.3 above. If the site changes then the potential for protected species to use the site may change accordingly.

5.1 Summary of Findings

In total thirty species of bird were recorded during the surveys. Eighteen of these were considered to be breeding or probably breeding. This included bird species listed on both the Red and Amber lists of Birds of Conservation Concern (Eaton *et al.* 2009) and listed on the UK Biodiversity Action Plan as priority species. No birds listed on Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended) were recorded as breeding on site.

5.2 Bird Assemblage

The number of bird species breeding in an area can give an approximate estimate of its importance for birds (Fuller 1980). Since the publication of Fuller's method, further declines have been recorded in many bird populations. This has led the Institute of Ecologists and Environmental Management (IEEM) to produce an updated table of levels of importance. That adapted criteria has been incorporated into the table below.

Table 4. Site importance by number of breeding bird species present

Site importance	**Local**	**District**	**County**	**Regional**	**National**
Number of breeding bird species	<25	25-49	50-69	70-84	85+

Based on these criteria Yennadon Quarry (and surrounding land) has a breeding assemblage of *local importance*.

5.3 Summary of Legislation

Bird species are protected under Section 1 of the Wildlife and Countryside Act, 1981 (as amended). This makes it an offence to take, damage or destroy the nests of wild birds whilst being built or in use.

5.4 Impacts

Impacts for each bird species which have been assessed as a confirmed breeding species (or probable breeding species) is considered in the table below based on survey results.

Table 5. Likely impacts on bird species recorded as confirmed or probably breeding on site.

Common name	Latin name	Likely anticipated impacts
Linnet	*Carduelis cannabina*	**Loss of small area of potential nesting habitat. Scale of impact: small and local**
Skylark	*Alauda arvensis*	**Loss of small area of potential nesting habitat Scale of impact: small and local**
Yellowhammer	*Emberiza citrinella*	**Loss of small area of potential nesting habitat Scale of impact: small and local**
Song Thrush	*Turdus philomelos*	No anticipated loss in suitable nesting habitat Scale of impact: none
Dunnock	*Prunella modularis*	No anticipated loss in suitable nesting habitat Scale of impact: none
Stonechat	*Saxicola torquata*	**Loss of small area of potential nesting habitat Scale of impact: small and local**
Meadow Pipit	*Anthus pratensis*	**Loss of small area of potential nesting habitat Scale of impact: small and local**
Willow Warbler	*Phylloscopus trochilus*	No anticipated loss in suitable nesting habitat Scale of impact: none
Coal tit	*Periparus ater*	No anticipated loss in suitable nesting habitat Scale of impact: none
Blackbird	*Turdus merula*	No anticipated loss in suitable nesting habitat Scale of impact: none
Pied Wagtail	*Motacilla alba*	No anticipated loss in suitable nesting habitat Scale of impact: none
Wren	*Troglodytes troglodytes*	No anticipated loss in suitable nesting habitat Scale of impact: none
Chaffinch	*Fringilla coelebs*	No anticipated loss in suitable nesting habitat Scale of impact: none
Blue tit	*Cyanistes caeruleus*	No anticipated loss in suitable nesting habitat Scale of impact: none
Robin	*Erithacus rubecula*	No anticipated loss in suitable nesting habitat Scale of impact: none
Greenfinch	*Carduelis chloris*	No anticipated loss in suitable nesting habitat Scale of impact: none
Great tit	*Parus major*	No anticipated loss in suitable nesting habitat Scale of impact: none
Chiffchaff	*Phylloscopus collybita*	No anticipated loss in suitable nesting habitat Scale of impact: none

5.4.1 During construction phase

Scraping or clearing of vegetation has potential to kill or injure nesting birds (if works were conducted during the breeding season) which are associated with the unenclosed acid grassland and gorse scrub matrix of the area of proposed new quarry. Therefore removal of vegetation should be timed to avoid the nesting season, i.e. only carried out between October and February.

5.4.2 During operational phase

The loss of approximately 1.0ha of open acid grassland, scattered gorse scrub and bracken is expected to result in the loss of a small amount of nesting and foraging habitat with potential to be used by linnet, skylark, yellowhammer, stonechat and meadow pipit.

The proposed restoration of existing spoil piles for the benefit of biodiversity is anticipated to mitigate for the loss of this habitat in the long term which will provide replacement habitat for a variety of bird species including the five species named above. A specific biodiversity mitigation and enhancement strategy will ensure this. *It should be noted that there is extensive alternative habitat adjacent to the site.*

5.5 Avoidance, Mitigation and Enhancement

Planning Policy Statement 9 (PPS9) states that planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. The following measures are aimed at reducing impacts on biodiversity and ensuring long term ecological enhancements as a result of this development (with specific regard for bird species).

Table 6. Measures to avoid and mitigate for adverse impacts, and enhance the site for bird species.

Measure	**Reason**
Cut and maintain vegetation within area of proposed works at a short (<4cm) height during the period October to end of February. Ensure all cuttings are removed. This method should be employed in all areas which will be affected by new quarrying works.	To prevent harm to bird species whilst nesting.
Creation of a specific biodiversity mitigation and enhancement strategy. This should include the restoration of acid grassland and scrub mosaic within previously quarried areas on site.	To restore locally typical habitat. This is anticipated to benefit a variety of biodiversity (including bird species).

6. Wildlife Legislation and Planning Policy Context

6.1 Wildlife and Countryside Act 1981 (as amended): Part 1 (Bird Species)

All wild birds are protected under part 1 of the Wildlife and Countryside Act, 1981. Therefore, in the UK it is an offence to:

- Take, damage or destroy the nest of any wild bird whilst it is being built or in use.
- Kill, injure or take any wild bird
- Take or destroy the eggs of any wild bird

Certain species which are listed in Schedule 1 of the Wildlife and Countryside Act (1981) receive special protection. In these cases any form of intentional or reckless disturbance when they are nesting or rearing dependant young, constitutes an offence.

6.2 Birds of Conservation Concern

The Birds of Conservation Concern (BOCC) is an assessment of conservation status of British bird species based on a number of criteria set out within Eaton *et al.* (2009). Conservation status is indicated by a traffic light system of lists, with those listed on the Red list of highest conservation concern, followed by species on Amber and Green lists. Using such criteria is helpful when assessing impacts.

6.3 UK Biodiversity Action Plan Species

The original list of species and habitats within the UKBAP was adopted by the secretary of state as the list of habitats and species of principal conservation importance for the purpose of conserving biodiversity under Section 74 of the Countryside and Rights of Way (CROW) Act.

Government planning policy set out in Planning Policy Statement 9 (PPS9) is that:

'Planning authorities should ensure that species listed as of principal importance under Section 74 of the Countryside and Rights of Way Act are protected from the adverse effects of development, where appropriate, by using planning conditions or obligations'.

Since PPS9 was published, the UKBAP lists have been updated and Section 74 of the CROW Act has been replaced by the very similar list within Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. It is predicted that the UK BAP list will eventually be adopted by the secretary of state as habitats and species of principal importance under the NERC Act. PPS9 and associated documents will then be duly updated.

It is recommended to treat the UK BAP list as if it has already been adopted, and assume that the policy on species and habitats of principal importance set out in PPS9 applies to the UK BAP list.

Although UK BAP status does not constitute a legal protection, local planning authorities must have due regard within the planning process for these species and prevent any predicted adverse impacts of development.

6.4 Planning Policy Statement 9

Planning Policy Statement 9 (PPS9) sets out national planning policies on the protection of biodiversity and geological conservation. Circular 06/05 (DEFRA 01/05): Biodiversity and Geological Conservation: Statutory Obligations and Their Impact within The Planning System provides administrative guidance on application of the law in England relating to planning and nature conservation. Para 98 states 'The presence of protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. … They should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species … For European protected species further strict provisions apply … to which the planning authorities must have regard.'

Key principles of PPS9

Regional planning bodies and local planning authorities should adhere to the following key principles to ensure that the potential impacts of planning decisions on biodiversity and geological conservation are fully considered.

i. Development plan policies and planning decisions should be based upon up-to-date information about the environmental characteristics of their areas. These characteristics should include the relevant biodiversity and geological resources of the area. In reviewing environmental characteristics local authorities should assess the potential to sustain and enhance those resources.

ii. Plan policies and planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. In taking decisions, **local planning authorities should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; and to biodiversity and geological interests within the wider environment.**

iii. Plan policies on the form and location of development should take a strategic approach to the conservation, enhancement and restoration of biodiversity and geology, and recognise the contributions that sites, areas and features, both individually and in combination, make to conserving these resources.

iv. Plan policies should promote opportunities for the incorporation of beneficial biodiversity and geological features within the design of development.

v. Development proposals where the principal objective is to **conserve or enhance biodiversity** and geological conservation interests should be permitted.

vi. The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests. Where granting planning permission would result in significant harm to those interests, local planning authorities will need to be satisfied that the development cannot reasonably be located on any alternative sites that would result in less or no harm. In the absence of any such alternatives, local planning authorities should ensure that, before planning permission is granted, adequate mitigation measures are put in place. Where a planning decision would result in significant harm to biodiversity and geological interests which cannot be prevented or adequately mitigated against, appropriate compensation measures should be sought. If that significant harm cannot be prevented,

adequately mitigated against, or compensated for, then planning permission should be refused.

7. References

Sutherland (1996) *Ecological Survey Techniques.* Cambridge University Press.

8. Appendices

Appendix 1. Breeding Bird Survey Results

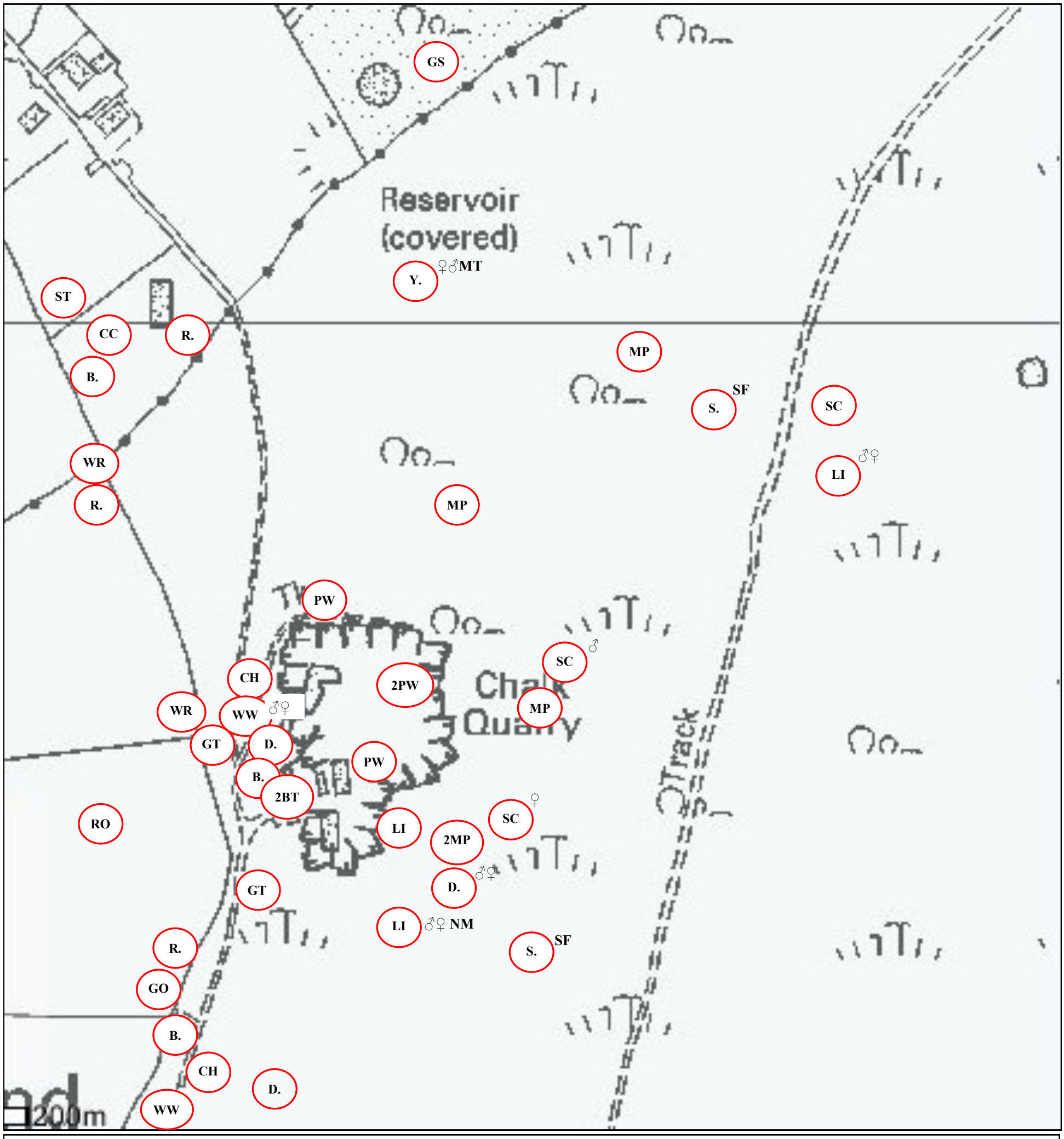
Common name	Latin name	Survey 1 07.04.11	Survey 2 13.05.11	Survey 3 14.06.11
House sparrow	*Passer domesticus*	-	√	-
Linnet	*Carduelis cannabina*	√	√	√
Skylark	*Alauda arvensis subsp.*	√	√	√
Song Thrush	*Turdus philomelos*	√	-	-
Yellowhammer	*Emberiza citrinella*	√	-	-
Dunnock	*Prunella modularis*	√	√	√
Meadow Pipit	*Anthus pratensis*	√	√	√
Stonechat	*Saxicola torquata*	√	√	√
Willow Warbler	*Phylloscopus trochilus*	√	√	√
Blackbird	*Turdus merula*	√	√	√
Blue tit	*Cyanistes caeruleus*	-	-	√
Carrion crow	*Corvus corone corone*	-	√	-
Chaffinch	*Fringilla coelebs*	√	√	√
Chiffchaff	*Phylloscopus collybita*	√	√	√
Coal tit	*Periparus ater*	-	-	√
Goldfinch	*Carduelis carduelis*	√	-	-
Great tit	*Parus major*	√	√	√
Great spotted woodpecker	*Dendrocopos major*	√	-	-
Greenfinch	*Carduelis chloris*	-	-	√
Jackdaw	*Corvus monedula*	-	√	√
Long-tailed tit	*Aegithalos caudatus*	-	-	√
Magpie	*Pica pica*	-	√	√
Pied Wagtail	*Motacilla alba*	√	√	-
Robin	*Erithacus rubecula*	√	-	√
Rook	*Corvus frugilegus*	√	-	-
Woodpigeon	*Columba palumbus*	-	√	-
Wren	*Troglodytes troglodytes*	√	√	√

[i] Hobby and Spotted flycatcher were incidentally seen on other survey visits to the site.

Appendix 2. Breeding Bird Survey Maps

Attached

Site: Yennadon Quarry
Survey: Breeding Bird Survey
Surveyor: Adam Bratt BSc (Hons), AIEEM
Survey No.: 1
Date: 07.04.11
Sunrise: ~ 06.30
Start time: 06.20
Finish time: 08.20
Weather conditions: 10ºC <10% CC 0/1 WF Dry



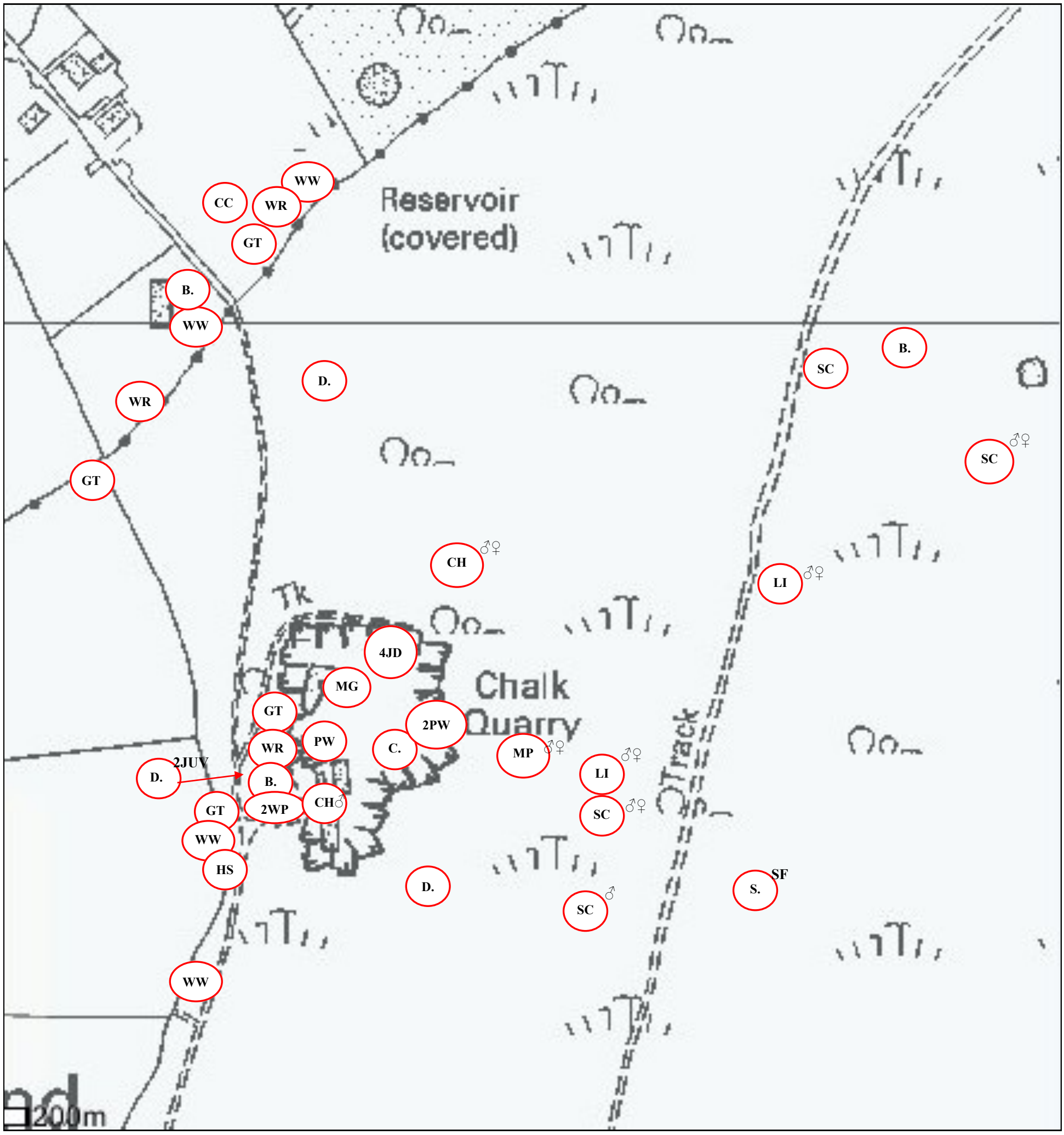
Key to bird species codes

HS	House Sparrow	CC	Chiffchaff
LI	Linnet	CT	Coal tit
S.	Skylark	GO	Goldfinch
ST	Song thrush	GT	Great tit
Y.	Yellowhammer	GS	Great spotted woodpecker
D.	Dunnock	GR	Greenfinch
MP	Meadow pipit	JD	Jackdaw
SC	Stonechat	LT	Long-tailed tit
WW	Willow warbler	MG	Magpie
B.	Blackbird	PW	Pied wagtail
BT	Blue tit	R.	Robin
C.	Carrion crow	RO	Rook
CH	Chaffinch	WP	Woodpigeon

Key to activity and other codes

2BT	Two blue tits seen
♂♀	Male female
SF	Song flight
MT	Mating behaviour
NM	Nesting material being carried
JUV	Juvenile birds

Site: Yennadon Quarry
Survey: Breeding Bird Survey
Surveyor: Adam Bratt BSc (Hons), AIEEM
Survey No.: 2
Date: 13.05.11
Sunrise: ~ 05.30
Start time 05.30
Finish time: 07.45
Weather conditions: 8ºC 10% CC WF 1/2 Dry



Key to bird species codes			
HS	House Sparrow	CC	Chiffchaff
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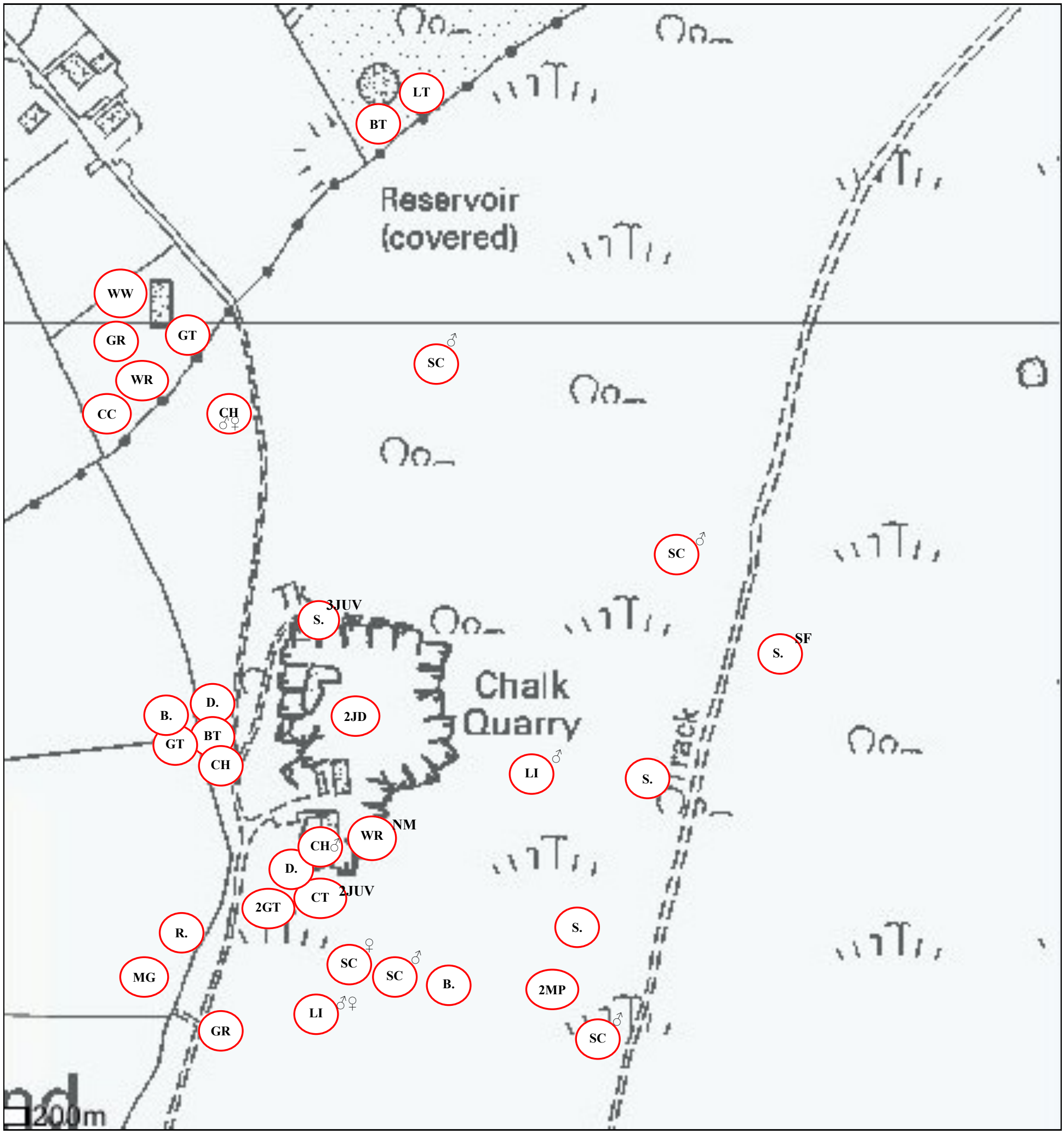
CH	Chaffinch	WP	Woodpigeon

Key to activity and other codes	
2BT	Two blue tits seen
♂♀	Male female
SF	Song flight
MT	Mating behaviour
NM	Nesting material being carried
JUV	Juvenile birds

Site: Yennadon Quarry
Survey: Breeding Bird Survey
Surveyor: Adam Bratt BSc (Hons), AIEEM
Survey No.: 3
Date: 14.06.11
Sunrise: ~ 05:03
Start time: 06:15
Finish time: 07:45
Weather conditions: Dry, bright, good visibility. ~8°C at start. ~10% cloud cover.



Key to bird species codes

HS	House Sparrow	CC	Chiffchaff
LI	Linnet	CT	Coal tit
S.	Skylark	GO	Goldfinch
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B.	Blackbird	PW	Pied wagtail
BT	Blue tit	R.	Robin
C.	Carrion crow	RO	Rook
CH	Chaffinch	WP	Woodpigeon

Key to activity and other codes

2BT	Two blue tits seen
♂♀	Male female
SF	Song flight
MT	Mating behaviour
NM	Nesting material being carried
JUV	Juvenile birds

Butterfly Survey Report

Site: Yenndon Quarry

Client: Yennadon Stone Ltd.

Report Date: November 2011

Prepared by	Adam Bratt BSc (Hons), MIEEM
Checked by	Sue Searle BSc (Hons), PGDip (Ecology), MIEEM
Approved by	Sue Searle BSc (Hons), PGDip (Ecology), MIEEM

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IEEM Member subject to the Code of Professional Conduct.

Contents

1. Summary

This is a brief summary of findings and recommendations. Please read the report in its entirety for full details.

- Surveys for butterflies were undertaken during spring and summer 2011 due to the potential for legally protected and notable butterfly species to be present within habitat of the proposed quarry extension on Yennadon Down.
- Particular effort was given to identifying whether high brown fritillary (*Argynnis adippe*) *and other fritillaries* were present.
- Surveys did not identify a population of high brown fritillary or other fritillaries using the site, although six relatively widespread species and one UK BAP species (small heath *Coenonympha pamphilus*) were noted.
- A specific biodiversity mitigation and enhancement plan is recommended to ensure that impacts on butterfly species are minimised and long term ecological enhancements are gained.

2. Introduction

This butterfly survey report was commissioned by Yennadon Stone Ltd. and surveys for butterfly species undertaken during the summer of 2011 by staff of Acorn Ecology Ltd. These surveys were undertaken after a Phase 1 habitat survey undertaken in November 2010 (and August 2006 by Rural Arisings Ltd) highlighted the potential for legally protected butterfly species to be present on site, such as the high brown fritillary butterfly (*Argynnis adippe*).

The purpose of the survey was to assess the use of the site by butterflies (with particular reference to the presence of high brown fritillary and other fritillaries), identify any impacts of the development on legally protected or notable butterfly species and make recommendations for avoidance, mitigation or compensation as appropriate.

2.1 High Brown Fritillary

The high brown fritillary is a legally protected butterfly species listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and also a UK Biodiversity Action Plan species. The species has undergone significant declines in both distribution and population since 1970 (Fox *et al*. 2006).

High brown fritillary are identified in habitats including grass and bracken mosaic. Strongholds for the species include sites in the southwest of England on Dartmoor and Exmoor (Asher *et al.* 2001). The larval food plants for this species include various species of violet.

Larvae hatch in spring and can be seen basking on vegetation including dead bracken. Adult butterflies can be seen on the wing between mid June until early August.

Other legally protected butterfly species which may be found in similar habitats (and range) as those identified at Yennadon Quarry include pearl bordered (*Boloria euphrosyne*) and small pearl bordered (*Boloria selene*) fritillaries.

2.2 Site Location

The site is located on the edge of Yennadon Down on the south western side of Dartmoor National Park (Grid reference SX 542 687) at a height of approximately 250m above sea level. The village of Dousland is situated less than 500m to the west and Burrator Reservoir is located approximately 1km to the east. The immediate surroundings consist of open down with enclosed fields of pasture within 100m to the west. An area of sessile oak and beech woodland is located approximately 270m to the north.

2.3 Site Description

Yennadon Stone Quarry is an active stone quarry measuring approximately 1.5 ha in area. The quarry is surrounded by unenclosed acid grassland, bracken and scattered gorse scrub.

2.4 Proposed Development

It is proposed that the existing quarry will be extended to the north as shown in Drawing No. FIG2 Rev. P1 and Drawing No.FIG3 Rev. P2 produced by John Grimes Partnership Ltd. The extended area measures approximately 1.0 ha in size.

It is proposed to infill the depleted part of the quarry in a phased manner concurrently with the ongoing excavation. On completion of quarrying operation, it is planned to restore the site to near original ground profile. The restoration will create habitat for local species and will be accessed by National Park visitors.

3. Methods

3.1 Data Search

A data search was undertaken by Devon Biodiversity Records Centre (DBRC) in November 2010. The data search identified records of legally protected and notable butterfly species within a 2km radius of the site (Grid reference SX 542 687).

A further data search specifically for the high brown fritillary butterfly within the 10km grid square containing the survey site was undertaken using the National Biodiversity Network website (www.searchnbn.net).

3.2 Larval Food Plant Survey

A survey for larval food plants of the high brown fritillary was undertaken by Adam Bratt BSc (Hons), AIEEM on the 7th April 2011. The area of proposed new quarry was walked and the presence of violets noted. The frequency of occurrence of violets within the survey area was assessed against the DAFOR scale (Dominant, abundant, frequent, occasional and rare).

3.3 Larval Survey

A survey for larva of the high brown fritillary was undertaken by Adam Bratt BSc (Hons), AIEEM on the 7th April 2011. Thirty patches of bracken litter (each approximately 2 m^2) within the area of proposed new quarry were visually inspected for signs of basking larvae. Each patch of bracken was inspected for between 1-2 minutes for the presence of larvae (caterpillars). Weather conditions were 14^oC, dry and 50% cloud cover.

3.4 Butterfly Transect Survey

Three walked transect surveys were conducted between July and August 2011 to determine the presence of adult butterflies within the area of proposed new quarry. Surveys were carried out based on methodology used in the UK Butterfly Monitoring Scheme (www.ukbms.org/methods), originally produced by Pollard and Yates (1993).

The transect comprised seven sections throughout the area of proposed new quarry and the immediate surrounds, totalled approximately 1km in length and covered a representation of the habitats present. The habitat within each section was described using the habitat classification for butterfly transects produced by the UK Butterfly Monitoring Scheme.

Surveys were undertaken during suitable weather conditions (either 13-17^oC with at least 60% sunshine or over 17^oC and not raining) and where possible between the hours of 10:45 and 15:45 hours.

Transects were walked at a steady, slow pace to enable identification of butterflies seen. All butterflies within 2.5m either side of the surveyor (and 5m in front) were recorded. Binoculars were available to aid with identification.

Table 1. Details of butterfly surveys undertaken at Yennadon Quarry.

Survey type	Date	Surveyor	Weather conditions and times (where appropriate)
Larval food plant survey	7th April 2011	Adam Bratt BSc (Hons), AIEEM	14°C, 50% cloud cover, dry.
Larval survey	7th April 2011	Adam Bratt BSc (Hons), AIEEM	14°C, 50% cloud cover, dry.
Transect survey 1	15th July 2011	Adam Bratt BSc (Hons), AIEEM	Start time: 11:30 18°C, 100% cloud cover, dry.
Transect survey 2	27th July 2011	Adam Bratt BSc (Hons), AIEEM	Start time: 14:45 25°C, 20% cloud cover, dry.
Transect survey 3	9th August 2011	Sue Searle BSc (Hons), PG Dip (Ecology), MIEEM	Start time: 16:45 18°C, 15% cloud cover, dry.

4. Survey Results

4.1 Data Search Results

The data search undertaken by the Devon Biodiversity Records Centre (DBRC) identified nine records of butterflies within 2km of the site. There are also records of high brown fritillary within approximately 4km listed on www.searchnbn.net.

Table 2. Data search results for butterfly species (DBRC)

Common name	Latin name	Date	OS Grid Reference	Location	Approximate distance from site
Purple Hairstreak	*Quercusia quercus*	1999	SX5467	Meavy	1.75km south
Purple Hairstreak	*Quercusia quercus*	1998	SX5468	Burrator	1km south
Purple Hairstreak	*Quercusia quercus*	1999	SX5567	Bowden's plntn.	1.75km south south- east
Purple	*Quercusia*	1998	SX5668	Yellowmead	2km south east

Hairstreak	*quercus*			Down.	
Small Heath	*Coenonympha pamphilus*	2001	SX5568	Burrator Reservoir.	1km south east
Small Heath	*Coenonympha pamphilus*	1984	SX560690	Burrator Reservoir, Nr. Sheepstor.	1.75km east
Small Heath	*Coenonympha pamphilus*	1997	SX5668	Yellowmead Down.	2km south east
Small Pearl-bordered Fritillary	*Boloria selene*	1990	SX5568	Burrator Reservoir.	1km south east
Wall Brown	*Lasiommata megera*	1998	SX5668	Yellowmead Down.	2km south east

NB the lack of survey data is likely to be due to lack of survey effort or non-submission of records.

4.2 Larval Food Plant Survey

Common dog violets (*Viola riviniana*) were identified within the bracken and acid grassland mosaic of the area of proposed new quarry. The frequency of occurrence for violets throughout the site was assessed as being 'Occasional'.

4.3 Larval Survey

No caterpillars of the high brown fritillary or other fritillaries were identified during the larval survey. A single caterpillar of the drinker moth (*Euthrix potatoria*) was identified on a patch of bracken.

4.4 Butterfly Transect Survey

No high brown fritillary (or other legally protected butterfly species) were identified during the transect surveys. Seven species of butterflies were identified during the surveys including individuals or small numbers of speckled wood (*Pararge aegeria*), meadow brown (*Maniola jurtina*), gatekeeper (*Pyronia tithonus*), large white (*Pieris brassicae*), small copper (*Lycaena phlaeas*), ringlet (*Aphantopus hyperantus*) and small heath (*Coenonympha pamphilus*).

The small heath is a UK Biodiversity Action Plan Species which has undergone significant long term population declines (Fox *et al*. 2006). An individual of this species was recorded on the survey conducted on the 9th August 2011.

Table 3. Numbers of butterflies recorded during each survey.

Species	Transect survey 1	Transect survey 2	Transect survey 3
Speckled wood (*Pararge aegeria*)	-	1	5
Meadow brown (*Maniola jurtina*)	2	7	1
Gatekeeper (*Pyronia tithonus*)	-	1	-
Large white (*Pieris brassicae*)	-	4	-
Small copper (*Lycaena phlaeas*)	-	1	1
Ringlet (*Aphantopus hyperantus*)	-	1	-
Small heath (*Coenonympha pamphilus*)	-	-	1

Raw data showing the number of butterflies recorded on each sector of the transect are given in Appendix 1.

4.5 Survey Constraints

Surveys were carried out during optimal times of year and suitable weather conditions. The third transect survey was conducted at 16:45 (later in the day than survey recommendations) but weather conditions were considered optimal and butterflies were active.

5. Evaluation

Please note that all conclusions and recommendations are based upon the current survey findings and on the proposal outlined in 2.3 above. If the site changes then the potential for protected species to use the site may change accordingly.

5.1 Summary of Findings

No high brown fritillary (or other legally protected butterfly species) were identified during either the larval survey or transect surveys for adult butterflies. Small numbers of common dog violet were however identified which means the habitat may be suitable for high brown fritillary (and other fritillary species). A single small heath (a UK BAP species) was identified on one transect survey.

5.2 Summary of Legislation

High brown fritillary butterflies are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to intentionally kill, injure or take this species (amongst other things). See Section 6 for more details.

5.3 Impacts

5.3.1 During construction phase

It is considered unlikely that legally protected butterfly species breed regularly on site. Therefore works to clear vegetation in the area of proposed new quarry are not anticipated to result in an offence occurring.

5.3.2 During operational phase

The loss of approximately 1.0ha of open acid grassland, scattered gorse scrub and bracken is expected to result in a small loss of habitat for common butterfly species and one UK BAP Species (small heath). UK BAP Species are of material consideration in the planning process (see 6.2 for more details) and measures to protect these species from adverse impacts should be formulated.

The proposed restoration of existing spoil piles for the benefit of biodiversity is anticipated to mitigate for the loss of this habitat which will provide replacement habitat for a variety of invertebrate species including small heath butterfly. A specific biodiversity mitigation and enhancement strategy will ensure this.

5.4 Avoidance, Mitigation and Enhancement

Planning Policy Statement 9 (PPS9) states that planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. The following measures are aimed at reducing impacts on biodiversity and ensuring long term ecological enhancements as a result of this development (with specific regard for butterfly species).

Table 4. Measures to avoid and mitigate for adverse impacts, and enhance the site for butterfly (and many other invertebrate) species.

Measure	Reason
Creation of a specific biodiversity mitigation and enhancement strategy. This should include the restoration of acid grassland and scrub mosaic within previously quarried areas on site.	To restore locally typical habitat. This is anticipated to benefit a variety of biodiversity (including invertebrate species).

6. Wildlife Legislation and Planning Policy Context

6.1 Wildlife and Countryside Act 1981 (as amended): Schedule 5 Species

***Including high brown fritillary butterfly**

Species receiving full protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) receive legal protection from:

- Intentional killing, injuring, taking

- Possession or control (live or dead animal, part or derivative)
- Damage to, destruction of, obstruction of access to any structure or place used by a scheduled animal for shelter or protection
- Disturbance of animal occupying such a structure or place
- Selling, offering for sale, possessing or transporting for the purpose of sale (live or dead animal, part or derivative)
- Advertising for buying or selling such things

6.2 UK Biodiversity Action Plan Species

***Including small heath butterfly**

The original list of species and habitats within the UKBAP was adopted by the Secretary of State as the list of habitats and species of principal conservation importance for the purpose of conserving biodiversity under Section 74 of the Countryside and Rights of Way (CROW) Act.

Government planning policy set out in Planning Policy Statement 9 (PPS9) is that:

'Planning authorities should ensure that species listed as of principal importance under Section 74 of the Countryside and Rights of Way Act are protected from the adverse effects of development, where appropriate, by using planning conditions or obligations'.

Since PPS9 was published, the UKBAP lists have been updated and Section 74 of the CROW Act has been replaced by the very similar list within Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. It is predicted that the UK BAP list will eventually be adopted by the secretary of state as habitats and species of principal importance under the NERC Act. PPS9 and associated documents will then be duly updated.

It is recommended to treat the UK BAP list as if it has already been adopted, and assume that the policy on species and habitats of principal importance set out in PPS9 applies to the UK BAP list.

Although UK BAP status does not constitute a legal protection, local planning authorities must have due regard within the planning process for these species and prevent any predicted adverse impacts of development.

6.3 Planning Policy Statement 9

Planning Policy Statement 9 (PPS9) sets out national planning policies on the protection of biodiversity and geological conservation. Circular 06/05 (DEFRA 01/05): Biodiversity and Geological Conservation: Statutory Obligations and Their Impact within The Planning System provides administrative guidance on application of the law in England relating to planning and nature conservation. Para 98 states 'The presence of protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. … They should consider attaching appropriate planning

conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species … For European protected species further strict provisions apply … to which the planning authorities must have regard.'

Key principles of PPS9

Regional planning bodies and local planning authorities should adhere to the following key principles to ensure that the potential impacts of planning decisions on biodiversity and geological conservation are fully considered.

i. Development plan policies and planning decisions should be based upon up-to-date information about the environmental characteristics of their areas. These characteristics should include the relevant biodiversity and geological resources of the area. In reviewing environmental characteristics local authorities should assess the potential to sustain and enhance those resources.

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7. References

Asher J., Warren M., Fox R., Harding P., Jeffcoate G. and Jeffcoate S. (2001) *The Millenium Atlas of Butterflies in Britain and Ireland*. Oxford University Press.

Fox R., Asher J., Brereton T., Roy D. and Warren M. (2006) *The State of Butterflies in Britain and Ireland*. Pisces Publications.

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8. Appendices

Appendix 1. Butterfly Survey Transect and Results

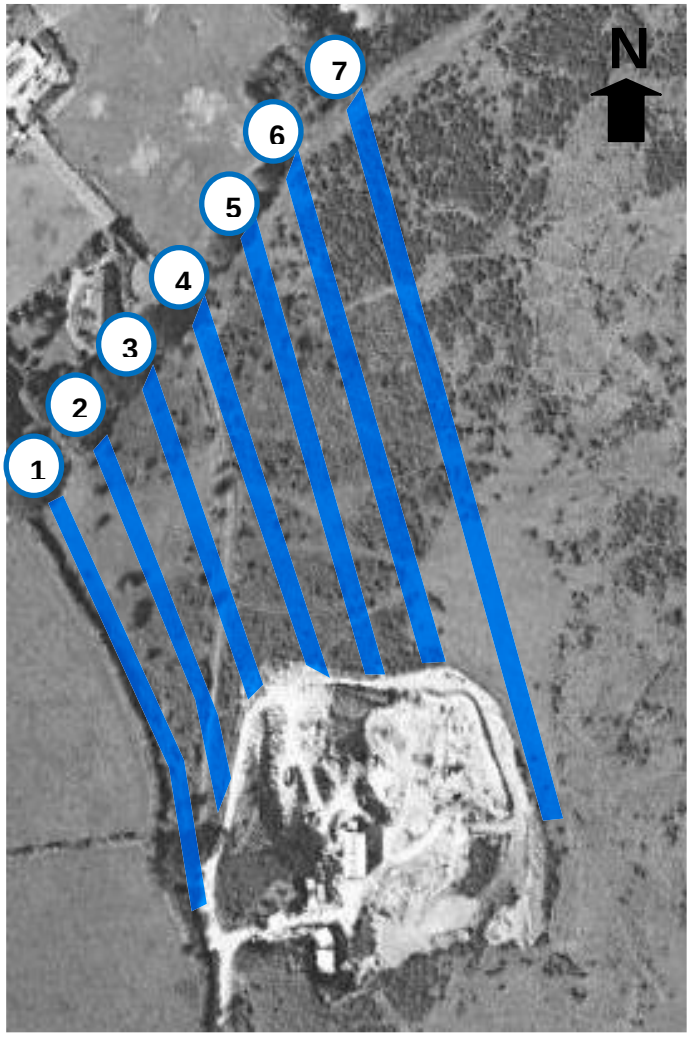

Figure 1. Butterfly transect route displayed. Route divided into seven sections.

Table 5. Habitat types within each section of transect. Taken from the UK Butterfly Monitoring Scheme's Habitat Classification for Butterfly Transects.

Section	Main Habitat Types
1	Hedgerow
2	Bracken dominated glade or hillside
3	Bracken dominated glade or hillside
4	Bracken dominated glade or hillside
5	Bracken dominated glade or hillside
6	Bracken dominated glade or hillside and dry semi/unimproved acid grassland
7	Dry semi/unimproved acid grassland

Table 6. Transect Survey Results (15th July 2011). Numbers of butterflies recorded per section.

Species	Section of transect						
	1	**2**	**3**	**4**	**5**	**6**	**7**
Meadow brown *Maniola jurtina*	-	1	-	-	-	1	-

Table 7. Transect Survey Results (27th July 2011). Numbers of butterflies recorded per section.

Species	Section of transect						
	1	**2**	**3**	**4**	**5**	**6**	**7**
Large white *Pieris brassicae*	-	2	-	-	1	-	1
Meadow brown *Maniola jurtina*	1	-	-	-	3	1	2
Speckled wood *Pararge aegeria*	1	-	-	-	-	-	-
Small copper *Lycaena phlaeas*	1	-	-	-	-	-	-
Ringlet *Aphantopus hyperantus*	-	-	-	-	-	1	-
Gatekeeper *Pyronia tithonus*	1	-	-	-	-	-	-

Table 8. Transect Survey Results (27th July 2011). Numbers of butterflies recorded per section.

Species	Section of transect						
	1	**2**	**3**	**4**	**5**	**6**	**7**
Meadow brown *Maniola jurtina*	-	1	-	-	-	-	-
Speckled wood *Pararge aegeria*	4	1	-	-	-	-	-
Small copper *Lycaena phlaeas*	-	-	1	-	-	-	-
*Small heath *Coenonympha pamphilus*	1	-	-	-	-	-	-

*UK Biodiversity Action Plan (UK BAP) Species.

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Reptile Survey Report

Site: Yenndon Quarry

Client: Yennadon Stone Ltd.

Report Date: November 2011

Prepared by	Adam Bratt BSc (Hons), MIEEM
Checked by	Sue Searle BSc (Hons), PGDip (Ecology), MIEEM
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Contents

1. Summary

This is a brief summary of findings and recommendations. Please read the report in its entirety for full details.

- Reptile surveys were conducted during spring and summer 2011 due to habitat with potential to support reptiles being identified within the proposed quarry extension.
- Surveys identified individual common lizards during three surveys. It is considered that small numbers of common lizards are located throughout the proposed new quarry extension.
- It is recommended that a translocation of reptiles out of the proposed new quarry area is undertaken before commencement of any ground works (e.g. turf stripping).
- A specific biodiversity mitigation and enhancement plan is recommended to ensure that clearance of the site does not harm reptile species and long term impacts on reptiles are minimised by a process of habitat restoration of existing spoil piles.

2. Introduction

This reptile survey report was commissioned by Yennadon Stone Ltd. and surveys for reptile species undertaken during the summer of 2011 by staff of Acorn Ecology Ltd. These surveys were undertaken after a Phase 1 habitat survey undertaken in November 2010 highlighted the potential for reptile species to be present on site.

The purpose of the survey was to determine presence of any reptile species, identify any impacts of the development on reptile species and make recommendations for avoidance, mitigation or compensation as appropriate.

2.1 Site Location

The site is located on the edge of Yennadon Down on the south western side of Dartmoor National Park (Grid reference SX 542 687) at a height of approximately 250m above sea level. The village of Dousland is situated less than 500m to the west and Burrator Reservoir is located approximately 1km to the east. The immediate surroundings consist of open down with enclosed fields of pasture within 100m to the west. An area of sessile oak and beech woodland is located approximately 270m to the north.

2.2 Site Description

Yennadon Stone Quarry is an active stone quarry measuring approximately 1.5 ha in area. The quarry is surrounded by unenclosed acid grassland, bracken and scattered gorse scrub.

2.3 Proposed Development

It is proposed that the existing quarry will be extended to the north as shown in Drawing No. FIG2 Rev. P1 and Drawing No.FIG3 Rev. P2 produced by John Grimes Partnership Ltd. The extended area measures approximately 1.0 ha in size.

It is proposed to infill the depleted part of the quarry in a phased manner concurrently with the ongoing excavation. On completion of quarrying operation, it is planned to restore the site to near original ground profile. The restoration will create habitat for local species and will be accessed by National Park visitors.

3. Methods

3.1 Data Search

A data search was undertaken by Devon Biodiversity Records Centre (DBRC) in November 2010. The data search identified records of reptile species within a 2km radius of the site (Grid reference SX 542 687).

3.2 Reptile Refugia Survey

The standard method for conducting reptile refugia surveys was employed. Reptile refugia (either bitumen roofing felt squares or sheets of corrugated bitumen or metal, measuring at least 0.5m^2) were placed in suitable habitat within the area of proposed new quarry to the north of the existing quarry.

Reptile tiles provide artificial basking opportunities for reptile species attracted to the heat beneath or above them. In total 34 tiles were placed on site on the 7th April 2011. After installing tiles on site they were left for a period of 12 days before surveying. Tiles were then checked on seven occasions for presence of reptiles. Surveys were undertaken during suitable weather conditions (dry, with temperatures between approximately 10-17^{o}C). Days where wind speeds were high (> wind force 4) were avoided.

3.3 Reptile Transect Survey

Four walked transect surveys were conducted between April and June 2011 to determine the presence of reptiles basking in areas of the site other than under or on top of reptile tiles. Each survey consisted of walking four North/ South routes through the proposed new quarry area and identifying any reptiles basking.

Surveys were undertaken during suitable weather conditions (dry, with temperatures between approximately 10-17^{o}C). Days where wind speeds were high (> wind force 4) were avoided.

Routes throughout the site were walked at a steady, slow pace to enable identification of any basking reptiles. Binoculars were available to aid with identification.

Table 1. Details of reptile surveys undertaken at Yennadon Quarry.

Survey type	Date and Time	Surveyor	Weather conditions
Transect Survey 1	7th April 2011 11:00	Adam Bratt BSc (Hons), AIEEM	14^{o}C, 50% cloud cover, dry.
Refugia Survey 1	19th April 09:15	Ele Cooper BSc (Hons), MSc	18^{o}C, 20% cloud cover, dry.
Refugia Survey 2	21st April 2011 08:50	Ele Cooper BSc (Hons), MSc	18^{o}C, 5% cloud cover, dry.
Refugia Survey 3	26th April 2011 08:50	Ele Cooper BSc (Hons), MSc	14^{o}C, 20% cloud cover, dry.
Refugia Survey 4 Transect Survey 2	10th May 2011 09:10	Ele Cooper BSc (Hons), MSc	13^{o}C, 70% cloud cover, dry.
Refugia Survey 5 Transect Survey 3	13th May 2011 08:30	Adam Bratt BSc (Hons), AIEEM	12^{o}C, 100% cloud cover, dry.

Refugia Survey 6 Transect Survey 4	14th June 2011 08:00	Adam Bratt BSc (Hons), AIEEM	12°C, 0% cloud cover, dry.
Refugia Survey 7	15th July 2011 10:45	Adam Bratt BSc (Hons), AIEEM	16°C, 100% cloud cover, dry.

4. Survey Results

4.1 Data Search Results

The data search undertaken by the Devon Biodiversity Records Centre (DBRC) identified two records of common lizard (*Zootoca vivipara*) within 2km of the site.

Table 2. Data search results for reptile species

Common name	Latin name	Date	OS Grid Reference	Location	Approximate distance from site
Common Lizard	*Zootoca vivipara*	1996	SX540699	Welltown	1.5km north
Common Lizard	*Zootoca vivipara*	2003	SX559682	Near Burrator Reservoir, Yelverton.	1.75km east south-east

NB the lack of records could be due to lack of survey effort or non-submission of records.

4.2 Reptile Refugia Survey

A single adult male common lizard was identified under a reptile tile on the survey carried out on the 13th May 2011. No other reptiles were identified under refugia. A single juvenile newt (either a palmate *Lissotriton helvetica* or smooth newt *Lissotriton vulgaris*) was identified under a tile on the 14th June 2011.

Results shown in Table 4 in Appendix 1.

4.3 Reptile Transect Survey

Single individual adult common lizards were identified on transects undertaken on the 7th April and 14th June 2011. These were both seen briefly and the sex of these individuals was not determined.

Results shown in Table 5 in Appendix 1.

4.4 Survey Constraints

Surveys were carried out during optimal times of year and suitable weather conditions. Grazing of livestock on the unenclosed sections of Yennadon Down precluded the installation of corrugated metal sheet refugia in these areas which may have harmed animals. However a combination of

bitumen roofing felt refugia and walked transects is expected to have identified reptile species present.

5. Evaluation

Please note that all conclusions and recommendations are based upon the current survey findings and on the proposal outlined in 2.3 above. If the site changes then the potential for protected species to use the site may change accordingly.

5.1 Summary of Findings

Individual common lizards were identified on three occasions. The suitability of habitat throughout the survey area indicates that the site supports a small and widespread population of common lizard.

5.2 Summary of Legislation

Common lizards are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are protected from being killed or injured (see section 6 for more details).

5.3 Impacts

5.3.1 During construction phase

Scraping or clearing of vegetation has potential to kill or injure reptiles and therefore a strategy to protect reptiles should be formulated.

5.3.2 During operational phase

The long term loss of approximately 1.0ha of open acid grassland, scattered gorse scrub and bracken is expected to result in the displacement of small numbers of common lizard and a small loss of habitat suitable for this species.

The proposed restoration of existing spoil piles for the benefit of biodiversity is anticipated to mitigate for this loss of this habitat in the long term which will provide replacement habitat for a variety of reptile species including common lizard. A specific biodiversity mitigation and enhancement strategy will ensure this.

5.4 Avoidance, Mitigation and Enhancement

Planning Policy Statement 9 (PPS9) states that planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. The following measures are aimed at reducing impacts on biodiversity and ensuring long term ecological enhancements as a result of this development (with specific regard for reptile species).

Table 3. Measures to avoid and mitigate for adverse impacts, and enhance the site for common reptile species.

Measure	Reason
A translocation of reptiles from the footprint of	To prevent harm to legally protected reptile

the new quarry area will be undertaken prior to any ground works on site (e.g. turf stripping). A translocation will comprise of setting out of reptile refugia (e.g. tiles) within the areas of work and relocating any reptiles beneath to adjacent habitat. Temporary reptile barrier fencing will be required to prevent recolonisation of the new quarry area prior to works commencing.	species such as common lizard.
Creation of two reptile hibernacula on new earth bund. The new hibernacula will follow guidelines on pages 45 and 46 of the Reptile Habitat Management Handbook (Amphibian and Reptile Conservation 2010). Hibernacula comprise features of rock and log piles under turf where reptiles can both overwinter and bask on top of. These will be created under the supervision of a suitably experienced ecologist.	To provide new habitat features suitable for over wintering and basking reptiles.
Creation of a specific biodiversity mitigation and enhancement strategy. This should include the restoration of acid grassland and scrub mosaic within previously quarried areas on site.	To restore locally typical habitat. This is anticipated to benefit a variety of biodiversity (including reptile species).

6. Wildlife Legislation and Planning Policy Context

6.1 Reptile Species

Common lizard, slow worm, adder and grass snake are all protected under Schedule 5 of the Wildlife and Countryside Act, 1981 against intentional injuring, killing or selling.

For development sites in **England, Wales or Scotland,** to avoid prosecution under the ***Wildlife and Countryside Act 1981 (as amended)***, wherever works will impact on slow worms, common lizards, adders and/or grass snakes there must be evidence that every reasonable effort was made to avoid breaking the law – including proof of adequate surveys and mitigation plans. Mitigation measures should, ideally, be agreed with the relevant SNCO (in this case Natural England).

Only the sand lizard and smooth snake are fully protected under the Wildlife and Countryside Act, 1981 (Section 9) and Regulation 9 of the Conservation of Habitats and Species Regulations 2010 against killing, injuring, capture, damaging or destroying a breeding or resting site, intentionally obstructing access to a place used for shelter, keeping, transporting or selling. This means that not only are the animals themselves protected but so are their habitats. These species do not occur in Devon outside specific nature reserves.

6.2 Planning Policy Statement 9

Planning Policy Statement 9 (PPS9) sets out national planning policies on the protection of biodiversity and geological conservation. Circular 06/05 (DEFRA 01/05): Biodiversity and Geological Conservation: Statutory Obligations and Their Impact within The Planning System provides administrative guidance on application of the law in England relating to planning and nature conservation. Para 98 states 'The presence of protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. … They should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species … For European protected species further strict provisions apply … to which the planning authorities must have regard.'

Key principles of PPS9

Regional planning bodies and local planning authorities should adhere to the following key principles to ensure that the potential impacts of planning decisions on biodiversity and geological conservation are fully considered.

i. Development plan policies and planning decisions should be based upon up-to-date information about the environmental characteristics of their areas. These characteristics should include the relevant biodiversity and geological resources of the area. In reviewing environmental characteristics local authorities should assess the potential to sustain and enhance those resources.

ii. Plan policies and planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. In taking decisions, **local planning authorities should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; and to biodiversity and geological interests within the wider environment.**

iii. Plan policies on the form and location of development should take a strategic approach to the conservation, enhancement and restoration of biodiversity and geology, and recognise the contributions that sites, areas and features, both individually and in combination, make to conserving these resources.

iv. Plan policies should promote opportunities for the incorporation of beneficial biodiversity and geological features within the design of development.

v. Development proposals where the principal objective is to **conserve or enhance biodiversity** and geological conservation interests should be permitted.

vi. The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests. Where granting planning permission would result in significant harm to those interests, local planning authorities will need to be satisfied that the development cannot reasonably be located on any alternative sites that would result in less or no harm. In the absence of any such alternatives, local planning authorities should ensure that, before planning permission is granted, adequate mitigation measures are put in place. Where a planning decision would result in significant harm to biodiversity and geological interests which cannot be prevented or adequately mitigated against, appropriate compensation measures should be sought. If that significant harm cannot be prevented,

adequately mitigated against, or compensated for, then planning permission should be refused.

7. References

Herpetofauna Worker's Manual (2003) Joint Nature Conservation Committee.

Edgar, P., Foster, J. and Baker, J (2010). Reptile and Amphibian Conservation, Bournemouth.

8. Appendices

Appendix 1. Reptile Survey Results

Table 4. Reptile refugia survey results

	Date of survey						
	19/04/11	**21/04/11**	**26/04/11**	**10/05/11**	**13/05/11**	**14/06/11**	**15/07/11**
Common lizard	-	-	-	-	1x adult male	-	-

Table 5. Reptile transect survey results

	Date of survey			
	07/04/11	**10/05/11**	**13/05/11**	**14/06/11**
Common lizard	1 x adult	-	-	1 x adult

Biodiversity Mitigation and Enhancement Plan

Site: Yennadon Quarry

Client: Yennadon Quarry Ltd

Date: August 2013

Prepared by	Sarah Candlin BSc(Hons), MCIEEM	
Checked by	Sue Searle BSc (Hons), PGDip (Ecology), MCIEEM	
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Contents

1. Introduction

1.1 Background and Context

Acorn Ecology Ltd. has been contracted by Yennadon Quarry Ltd. to produce a Biodiversity Mitigation and Enhancement Plan (BMEP) in relation to the proposed quarry extension at Yennadon Quarry.

This document provides a programme of mitigation, compensation and enhancement measures to ensure that the development has due regard for protected species and that the site is enhanced appropriately to benefit biodiversity. This therefore has regard for the National Planning Policy Framework (NPPF).

Recommendations are based on the findings of ecological surveys undertaken by Acorn Ecology Ltd at Yennadon Quarry between 2010 and 2013 and on the measures described in the Ecology Chapter which was produced in November 2011.

This report should be read in conjunction with the following documents:

- Verification Letter (Phase 1 update): May 2013
- Ecology Chapter Report: November 2011
- Reptile Survey Report: November 2011
- Breeding Bird Survey: November 2011
- Bat Activity Surveys: November 2011
- Butterfly Surveys: November 2011
- Badger Sett Monitoring: November 2011
- Extended Phase 1 Habitat Survey Report: 9th November 2010

1.2 Site Location and Description

Yennadon Stone Quarry is an active stone quarry measuring approximately 1.5 ha in area. Immediately surrounding the quarry there is unenclosed acid grassland, bracken and scattered gorse scrub.

The quarry is located on the edge of Yennadon Down on the south western side of Dartmoor National Park (Grid reference SX 542 687) at a height of approximately 250m above sea level. The village of Dousland is situated less than 500m to the west and Burrator Reservoir is located approximately 1km to the east. The immediate surroundings consist of open down with enclosed fields of pasture within 100m to the west. An area of sessile oak and beech woodland is located approximately 270m to the north.

1.3 Proposed Development

It is proposed that the existing quarry will be extended to the north as shown in Drawing No. FIG2 Rev. P1 (see figure 1 in Appendix 1) and Drawing No.FIG3 Rev. P2 produced by John Grimes Partnership Ltd. The extended area measures approximately 1.0 ha in size. To screen the quarry during the operational phase, a bund will be created around the north western and northern peripheries of the quarry extension area.

It is proposed to infill the depleted part of the quarry in a phased manner concurrently with the ongoing excavation. On completion of quarrying operation (by 2025), it is planned to restore the site to form an elongated bowl with slopes profiled to between 20° and 30°, with shorter sections of 40°. The restoration will involve removing the screening bund.

Once the vegetation in the restored quarry has established it will be returned to common land. Please see Restoration and Aftercare Plan produced by John Grimes Partnership Ltd dated 7th May 2013.

Phases of extraction and restoration are shown in drawing nos. 957/PL8, 957/PL9, 957/PL10, 957/PL11 and 957/PL12 produced by Peter Swann & Associates and dated July 2013.

2. Summary of survey findings and impacts

Table 1 provides a brief summary of the survey findings and likely impacts (in the absence of mitigation) at Yennadon Quarry.

The table then includes a brief description of mitigation and enhancement measures that will be implemented to ensure that the residual effects of the proposed quarry extension will either be neutral, negligible or beneficial (based on tables 12 and 13 in the Ecology Chapter).

This section of the document aims to provide a brief background for anyone reading this document, but does not provide full details. The relevant reports and/or the Ecology Chapter should be read in full for more detailed information regarding survey findings and consideration of impacts.

Mitigation measures listed in table 1 are expanded on in sections 3 and 4.

Table 1. Summary of ecological survey findings, impacts and mitigation measures at Yennadon Quarry

Ecological Feature	Survey Findings	Impact of proposals in absence of mitigation	Mitigation/enhancement measures	Predicted residual effects
Habitats	Habitats on site include unimproved acid grassland, bracken, scrub (mainly European gorse), scattered trees and a hedgerow. An active quarry is also present with associated rock faces and spoil.	The hedgerow will be retained. No impact.	N/A	N/A
		Loss of approximately 1.0ha of unimproved acid grassland, bracken and scrub mosaic. Impact adverse at the local level.	Managed site restoration to include seeding with local plant species and biological monitoring	Beneficial*
		Loss of approximately 10 scattered hawthorn trees. Impact adverse at site level.	Compensatory planting of tress on new bund and across site during restoration	Negligible
		Ecological impact associated with the quarry face is anticipated to be neutral.	Spoil and infilled areas of quarry to be capped with locally sourced topsoil, seeded with local plant species and monitored	Neutral
		N/A	Pond creation	Beneficial
Badgers	Two active badger setts (signs of recent activity during checks in 2010, 2011 and 2013) in hedgerow to west of quarry.	Quarry extension will be >50m from these sett entrances (as opposed to 80m at present). Damage to badger sett or significant increase in disturbance not anticipated. Loss of approximately 1.0ha of sub-optimal foraging habitat. Impact anticipated to be negligible.	Avoid vehicle movement or digging operations within a distance that would either damage sett or disturb badgers	Negligible
Bats	No roosts identified on site but quarry and its immediate	No loss of roosts and no increase in artificial lighting anticipated.	Four bat boxes to be installed on mature trees in the vicinity	Neutral

	surrounds are used for foraging by common pipistrelle and noctule bats.	Loss of approximately 1.0ha of foraging habitat is anticipated to have a negligible impact on bat species at the local level.		
Birds	In total eighteen bird species were identified breeding/probably breeding on or adjacent to the site. This included species listed on both the Red and Amber lists of Birds of Conservation Concern (Eaton *et al* 2009).	Loss of potential nesting habitat for five bird species (linnet, skylark, yellowhammer, stonechat and meadow pipit) associated with the loss of 1.0 ha acid grassland and scrub habitat. Impact anticipated to be adverse at the site level.	Four nest boxes (2 robin; 2 tit) to be installed on mature trees in the vicinity. Site clearance to be undertaken at time of year and in a manner to avoid harm to nesting birds (including ground nesting birds).	Negligible
Butterflies	Six widespread and common butterfly species, and a single small heath (UK BAP species) were identified during transect surveys. No high brown fritillaries (or other legally protected butterfly species) were identified.	Loss of ~1.0ha of acid grassland, gorse scrub and bracken mosaic will result in small loss of habitat for common butterfly species and one UK BAP species. Impact anticipated to be adverse at the site level.	Managed site restoration with local plant species will provide an enhanced habitat	Beneficial*
Reptiles	A small, widespread population of common lizards (individual noted on three occasions) is present within the survey area and beyond.	Impact anticipated to be adverse at the site level. Potential for common lizards to be killed or injured during site clearance. Loss of approximately 1.0ha of suitable habitat.	Reptiles to be translocated prior to site clearance at each Phase of works. To include erection of reptile barrier fencing. Two new reptile hibernacula to be created during site restoration	Negligible

3. Ecological mitigation and enhancement measures

The following mitigation strategies have been developed to avoid any offences under wildlife legislation and reduce impacts to habitats and species identified within the previous section. Measures have also been implemented to enhance the biodiversity value of the site.

Please note that the recommended mitigation measures will need to be reviewed and adapted as appropriate at each phase to account for changes in habitat and/or success (or otherwise) of vegetation establishment.

3.1 Habitats

The following measures will mitigate for the loss of existing habitats and will benefit a range of species including reptiles, invertebrates (including butterflies), birds and bats.

Table 2. Habitat restoration measures

Ref.	Measure	Reason
3.1.1	**Seeding new screening bund**	A bund will be created along the north-west and northern edge of the proposed new quarry extension in order to screen quarrying operations. This will be seeded with species-rich locally sourced seed of locally typical grass and flower species suitable for the acidic soil type present. The best time to seed areas is during late Summer/early Autumn or in the Spring. Please follow supplier guidelines when sowing. Dartmoor National Park may be able to provide advice on sourcing locally typical acid grassland seed (preferred option). However, other suitable suppliers include: - www.reallywildflowers.co.uk – **meadow mix for acid soils.** - www.britishflora.co.uk- **dry/semi-acidic soil mix.** Also dog-violet and heath dog violet seedling plugs will be planted to give larval food plants for fritillary butterflies. Plugs will be planted at a density of 20 per 100m^2 in a scattered arrangement. Suitable suppliers: - www.wildflowershop.co.uk. - www.britishflora.co.uk
3.1.2	**Restoration of spoil piles and infilled sections of quarry.**	Long term redundant spoil piles from previous quarrying activities on site will be manipulated to restore the original ground profile (in phases). At this time these areas will be capped with locally sourced topsoil and seeded with a seed mix of species-rich locally typical grass and flower species. The best time to seed areas is during late Summer/early Autumn or in the Spring. Please follow supplier

		guidelines when sowing. Dartmoor National Park may be able to provide advice on sourcing locally typical acid grassland seed (preferred option). However, other suitable suppliers include: - www.reallywildflowers.co.uk – **meadow mix for acid soils.** - www.britishflora.co.uk- **dry/semi-acidic soil mix.** Also dog-violet and heath dog violet seedling plugs will be planted to give larval food plants for fritillary butterflies. Plugs will be planted at a density of 20 per 100m^2 in a scattered arrangement. Suitable suppliers: - www.wildflowershop.co.uk. - www.britishflora.co.uk
3.1.3	**Tree planting**	Hawthorn trees will be planted on the newly created bund and in areas of restored habitat across the site. These will be planted in a randomised way to give the appearance of scattered and naturally self sown trees, rather than a straight formal line, evenly spaced. - Ten trees will be planted on the bund. - Five trees will be planted during each phase of the restoration process. Trees should be native and of local provenance. A list of native tree suppliers is provided on www.floralocale.co.uk Young trees will be protected by tree guards until established to prevent damage by rabbits and livestock. Tree guards will be removed once established.
3.1.4	Pond creation	To enhance the site for wildlife (particularly invertebrates including dragonflies) a pond will be created in the base of the infilled quarry. The pond will have the following specifications: - Surface area of approximately 350-400m^2 - Gently sloped edges (gradient no more than 1 in 3 and ideally shallower) to allow escape by amphibians. - The pond will have irregular (wavy) margins to maximise marginal, shallow habitats. - Pond depth will vary between 10cm and 1.2m depth. - No fish or exotic (non-native) vegetation will be introduced.

		- The habitat immediately surrounding the pond will be seeded using a species-rich seed mix of native plant species suitable for pond edge habitats. The seed mixture used will be EP1 – Pond Edge Mixture (sourced from Emorsgate Seeds – www.wildseed.co.uk). *Please follow supplier guidelines when sowing.*
	Monitoring of vegetation establishment on bund and restored quarry.	Establishment of vegetation (for each phase) will be monitored by the quarry manager on a monthly basis until established. Any invasive species that start colonising (e.g. buddleia) will be removed. Re-seeding or re-planting will be undertaken as necessary. Once vegetation has established fencing can be removed (as appropriate) to allow access to grazing animals on the common land and the public. Tree guards will be removed as appropriate. Long term monitoring will also be undertaken by an ecologist as described in section 3.7.1.
3.1.6	**Management of restored quarry**	The land will be returned to open-access common land (grazed by cattle, ponies and sheep) and will be managed in the same way as the surrounding land on Yennadon Down. This will provide a mosaic of habitats including scrub (gorse and/or heather) and more open grassy and flower-rich areas for the benefit of a variety of local species including birds, reptiles and invertebrates including butterflies.

3.2 Badgers

Badgers will benefit from the habitat restoration described in section 3.1 above, however further specific measures are required to ensure that no badger setts are damaged during the proposed works and that badgers are not disturbed.

Table 3. Measures to avoid and mitigate for adverse impacts to badgers.

Ref.	Measure	Reason
3.2.1	**Verification survey for badger setts** To ensure that no new badger setts are present.	Ecologist to undertake a verification survey approximately one month before each Phase of the quarry extension/excavation works commence. The area of the proposed quarry extension and the area within ~50m will be inspected for new badger setts. Note: *If new setts have been created and impacts on badgers or their setts are anticipated it may be necessary to apply for a licence from Natural England to undertake the works. Please note it is likely to take 6 weeks to obtain a licence and works to close the sett are only likely to be allowed in the period 1st July to 30th November.*

3.2.2	**Buffer zone around badger setts** To prevent damage to setts or an increase in levels of disturbance to badgers.	Ensure that vehicle movements, excavation works and storage of materials do not take place within 50m of existing badger sett entrances. A plan showing the buffer zone is provided in figure 2 in Appendix 2. The site manager will be responsible for ensuring that works do not take place within this buffer zone.

3.3 Bats

Bats will benefit from the habitat restoration described in section 3.1 above, however further specific measures are required to create new roosting opportunities on site and to ensure that bats are not deterred from foraging around the site.

Table 4. Measures to avoid and mitigate for adverse impacts, and enhance the site for bat species.

Ref.	Measure	Details
3.3.1	**Minimising artificial lighting**	Avoidance of any works (both during construction or operational phases) between sunset and sunrise during the period April to end of October which would increase artificial lighting on site.
3.3.2	**Installation of four bat boxes**	Install 2x Schwegler 2F and 2x Schwegler 2FN bat boxes on suitable mature trees bordering the site to the north of the new quarry extension. These will be erected on a trunk, a minimum of 3-4m above ground level and face in a southerly or south easterly direction. Boxes will have a clear flight path to them (i.e. not situated immediately behind dense vegetation). Erection of boxes will be supervised or undertaken by a suitably experienced ecological consultant. Boxes are available to purchase from www.nhbs.com.

3.4 Birds

Birds will benefit from the habitat restoration described in section 3.1 above, however further specific measures in relation to birds are described in Table 5.

Table 5. Measures to avoid and mitigate for adverse impacts, and enhance the site for bird species.

Ref.	Measure	Details
3.4.1	**Erection of bird nest boxes suitable for woodland bird species**	Four nest boxes will be erected on mature trees within the vicinity of the quarry (e.g. alongside the access track). The following models will be erected. - 2 x 1B Schwegler Nest Boxes with a 32mm entrance hole, erected at a height of >2m on north facing tree trunks. - 2 x 1N Schwegler Deep Nest Box, erected at a height of approximately 1.5m on north facing tree trunks, in a location that is not accessible to livestock. Boxes can be purchased from www.nhbs.com
3.4.2	**Vegetation clearance outside of bird nesting season**	Gorse and bracken within the area of the proposed works will be cut back to ground level (<4cm) during the period November to end of February when birds are not nesting and reptiles are not active. All cuttings (e.g. gorse brash and bracken) will be removed from the proposed quarry extension area as this could otherwise be used as nesting habitat (and cover for reptiles). This will need to be undertaken prior to each phase of the project.
3.4.3	**Timing of soil/grassland stripping**	Soil stripping for each phase to be undertaken outside of the skylark nesting season between September and end of February (only to be undertaken after the reptile translocation has been completed).

3.5 Butterflies

Butterflies (and other invertebrates) will benefit from the habitat restoration described in section 3.1.

3.6 Reptiles

Reptiles will benefit from the habitat restoration described in section 3.1 above, however further specific measures are described in Table 6 to ensure that reptiles are not killed or injured, and that new opportunities for hibernation are provided.

Table 6. Measures to avoid and mitigate for adverse impacts, and enhance the site for reptile species.

Ref.	Measure	Details
3.4.2	Vegetation clearance whilst reptiles are inactive	Cutting back gorse and bracken to ground level in November to February as described in Table 5, to aid capture of reptiles. Needs to be undertaken prior to the reptile translocation being undertaken.
3.6.1	Erection and maintenance of reptile barrier fencing.	Prior to a translocation of reptiles commencing for each phase, temporary reptile barrier fencing will be erected around the area of the proposed area of works in order to prevent reptiles recolonising prior to works commencing. Approximate locations for reptile fencing at each phase of works is provided in Figure 3 in Appendix 3. Details about how to construct reptile fencing are provided in Figure 4 in Appendix 3. To avoid trampling of the fence by livestock reptile fencing will be located within stock fencing where possible. Reptile fencing will be checked by site staff on a monthly basis (or as necessary) to ensure that it is intact and 'reptile proof'. Repair works will be undertaken as necessary. On completion of soil stripping works for each Phase, the reptile barrier fencing will be removed to allow reptiles to disperse around the site.
3.6.2	Reptile translocation	A translocation of reptiles from the footprint of each extraction phase (and the footprint of the new bund) will be undertaken prior to any ground works on site (e.g. turf stripping). The translocation will be conducted between April/May and September under suitable weather conditions (10°C and 20°C, with low winds and no precipitation). Artificial refugia (tiles made from bitumen roofing felt/corrugated metal sheets) will be laid at a high density in suitable habitat throughout the site (~500 - 1000 tiles per hectare).These refugia will then be left *in situ* for approximately two weeks prior to commencing the translocation. Visits will then be undertaken by the ecologist to catch reptiles from underneath/on the tiles or elsewhere on site, and move them to adjacent sections of Yennadon Down that will not be affected by the proposed quarry extension works. The translocation process will continue until very low numbers of/no reptiles are found for three consecutive visits.
3.6.3	Creation of two reptile	Creation of two reptile hibernacula in existing bund (Area B)

	hibernacula	when it is regraded. The new hibernacula will follow guidelines on pages 45 and 46 of the Reptile Habitat Management Handbook (Amphibian and Reptile Conservation 2010). Hibernacula comprise features of rock and log piles under turf where reptiles can both overwinter and bask on top of. These will be created under the supervision of a suitably experienced ecologist.

3.7 Biological monitoring

A biological monitoring programme should be established to determine the success of establishment of any habitat creation and effects on species groups.

Table 7. On-going monitoring

Ref.	Measure	Details
3.7.1	Biological monitoring will be undertaken to ensure the site mitigation and enhancement measures are establishing correctly and that populations are returning to or increasing from the baseline levels	Monitoring will be undertaken to establish the success of mitigation measures. Monitoring visits will be undertaken annually by an ecologist for the first 3 years after start of works and on alternate years for the next 4 years giving a total of 7 years of monitoring for each phase of works. Monitoring visits will be undertaken under suitable weather conditions in May/June and will involve: - Conducting walked transects to survey for butterflies, birds and reptiles. - Checking bat boxes for signs of use. - Checking areas of landscaping to ensure that planting has established successfully. Advice for improvements will be provided as necessary (e.g. removal of tree guards or re-seeding). *N.B. The site manager will also monitor establishment of vegetation as described in section 3.1.4.*

4. Mitigation Strategy and Phasing Plan

As the project is phased, a separate table is provided for each Phase of the project. These tables should be read in conjunction with section 3 of this report which provides more information about each mitigation measure.

Phases referred to are based on descriptions provided in the Restoration and Aftercare Plan dated 7th May 2013 and drawings 7397/06 – 7397/11 dated 24 May 2013, produced by John Grimes Partnership Ltd.

Table 8. Ecological works in relation to Phase 1 (bund creation and first phase of extraction and restoration): 2014 - 2018

Ref.code	Measure	Stage of works	Time of year	Who will undertake work and other details
3.4.1	Erection of bird boxes	Prior to commencement of works	Any time of year.	Quarry staff or contractor under guidance of an ecologist
3.3.2	Erection of bat boxes	Prior to commencement of works	Any time of year.	Quarry staff or contractor under guidance of an ecologist
3.4.2	Vegetation clearance in areas of proposed works including: - Bund construction area - Area F (extraction zone) - Sections of Area B which are being graded.	Prior to commencement of bund creation, grading and soil stripping works	October to end of February Undertake in the winter before commencing reptile translocation	Quarry staff or contractor.
3.6.1	Erection of reptile fencing around area of works. Must encompass bund construction zone, Area F and possibly Area B (if habitat suitable for reptiles).	Prior to commencement of bund creation and soil stripping works	Prior to reptile translocation commencing	Quarry staff/ contractor under specific on-site guidance from an ecologist.
3.6.1	Maintaining reptile fencing	Until reptile translocation has been completed and soil has been stripped.	Once a month whilst reptile translocation is on-going.	Site manager will be responsible.
3.6.2	Translocation of reptiles from area of works.	Prior to commencement of bund creation, grading and soil stripping works, but after reptile fence is erected.	April/May to September	Ecologist
3.2.1	Verification survey for badger setts	Prior to commencement of bund creation grading and soil stripping works	Any time of year. Approximately one month before commencement of works.	Ecologist
3.2.2	Buffer zone around badger setts	Throughout bund construction, quarry operation and restoration works.	All year.	Site manager will be responsible.
3.4.3	Soil/grassland stripping outside of skylark	During	September to February	Site manager will be responsible.

	nesting season.			
3.3.1	Minimising artificial lighting	Throughout bund construction, quarry operation and restoration works.	No works to be undertaken between sunset and sunrise during period April to October.	Site manager will be responsible.
3.6.3	Creation of 2 reptile hibernacula in Area B	During grading of this area.	Anytime.	Contractor/quarry staff under guidance of an ecologist.
3.1.1 and3.1.2	Seeding of new bund and Area B, and planting violet/dog violet plugs.	After bund creation and grading works.	Optimal time for sowing is Spring or Autumn.	Contractor/quarry staff under guidance of an ecologist.
3.1.3	Tree planting on new bund (10 hawthorn trees) and Area B (5 hawthorn trees).	After bund creation and grading works.	Optimal time for new planting is November – end of February	Contractor/quarry staff under guidance of an ecologist.
3.1.5	Monitoring vegetation establishment and re-seeding etc as necessary.	On-going. After seeding.	Every month during the growing season.	Site manager.
3.7.1	Biological monitoring	Annually for 3 years after start of works and alternate years for the next 4 years.	May to June	Ecologist.

Table 9. Ecological works in relation to Phase 2 extraction and restoration: 2018-2020

Ref.code	Measure	Stage of works	Time of year	Who will undertake work and other details
3.1.6	Remove fencing surrounding Area B so that it returns to grazed common land.	When vegetation has established.	Any	Quarry staff or contractor.
3.4.2	Vegetation clearance in areas of proposed works (Area G).	Prior to commencement of soil stripping works	October to end of February Undertake in the winter before commencing reptile translocation	Quarry staff or contractor.
3.6.1	Erection of reptile fencing around area G	Prior to commencement of soil stripping works	Prior to reptile translocation commencing	Quarry staff/ contractor under specific on-site guidance from an ecologist.
3.6.1	Maintaining reptile fencing	Until reptile translocation has been completed and soil has been stripped.	Once a month (or as necessary) whilst reptile translocation is on-going.	Site manager will be responsible.
3.6.2	Translocation of reptiles from Area G	Prior to commencement of soil stripping works, but after reptile fence is erected.	April/May to September	Ecologist
3.2.1	Verification survey for badger setts	Prior to commencement soil stripping works	Any time of year. Approximately one month before commencement of works.	Ecologist
3.2.2	Buffer zone around badger setts	Throughout quarry operation and restoration works.	All year.	Site manager will be responsible.
3.4.3	Soil/grassland stripping outside of skylark nesting season.	During	September to February	
3.3.1	Minimising artificial lighting	Throughout quarry operation and restoration works.	No works to be undertaken between sunset and sunrise during period April to October.	Site manager will be responsible.

3.1.2	Seeding/planting of Area E	After infilling of Area E	Optimal time for sowing is Spring or Autumn.	Contractor/quarry staff under guidance of an ecologist.
3.1.3	Tree planting in Area E	After infilling of Area E	Optimal time for new planting is November – end of February	Contractor/quarry staff under guidance of an ecologist.
3.1.6	Monitoring vegetation establishment and re-seeding etc as necessary.	On-going. After seeding.	Every month during the growing season.	Site manager.
3.7.1	Biological monitoring	Annually for 3 years after start of works and alternate years for the next 4 years.	May to June	Ecologist.

Table 10. Ecological works in relation to Phase 3 extraction: 2020-2022 *(N.B. No areas are due to be seeded/planted in this Phase)*

Ref.code	Measure	Stage of works	Time of year	Who will undertake work and other details
3.1.6	Remove fencing surrounding Area E so that it returns to grazed common land.	When vegetation has established.	Any	Quarry staff or contractor.
3.4.2	Vegetation clearance in areas of proposed works (Area H).	Prior to commencement of soil stripping works	October to end of February Undertake in the winter before commencing reptile translocation	Quarry staff or contractor.
3.6.1	Erection of reptile fencing around area H	Prior to commencement of soil stripping works	Prior to reptile translocation commencing	Quarry staff/ contractor under specific on-site guidance from an ecologist.
3.6.1	Maintaining reptile fencing	Until reptile translocation has been completed and soil has been stripped.	Once a month (or as necessary) whilst reptile translocation is on-going.	Site manager will be responsible.
3.6.2	Translocation of reptiles from Area H	Prior to commencement of soil stripping works, but after reptile fence is erected.	April/May to September	Ecologist
3.2.1	Verification survey for badger setts	Prior to commencement soil stripping works	Any time of year. Approximately one month before commencement of works.	Ecologist
3.2.2	Buffer zone around badger setts	Throughout quarry operation and restoration works.	All year.	Site manager will be responsible.
3.4.3	Soil/grassland stripping outside of skylark nesting season.	During	September to February	Site manager will be responsible.
3.3.1	Minimising artificial lighting	Throughout quarry operation and restoration works.	No works to be undertaken between sunset and sunrise during period April to October.	Site manager will be responsible.

Table 11. Ecological works in relation to Phase 4: 2020 – 2023

Ref.code	Measure	Stage of works	Time of year	Who will undertake work and other details
3.4.2	Vegetation clearance in areas of proposed works (Area I).	Prior to commencement of soil stripping works	October to end of February Undertake in the winter before commencing reptile translocation	Quarry staff or contractor.
3.6.1	Erection of reptile fencing around area I	Prior to commencement of soil stripping works	Prior to reptile translocation commencing	Quarry staff/ contractor under specific on-site guidance from an ecologist.
3.6.1	Maintaining reptile fencing	Until reptile translocation has been completed and soil has been stripped.	Once a month (or as necessary) whilst reptile translocation is on-going.	Site manager will be responsible.
3.6.2	Translocation of reptiles from Area I	Prior to commencement of soil stripping works, but after reptile fence is erected.	April/May to September	Ecologist
3.2.1	Verification survey for badger setts	Prior to commencement soil stripping works	Any time of year. Approximately one month before commencement of works.	Ecologist
3.2.2	Buffer zone around badger setts	Throughout quarry operation and restoration works.	All year.	Site manager will be responsible.
3.4.3	Soil/grassland stripping outside of skylark nesting season.	During	September to February	Site manager will be responsible.
3.3.1	Minimising artificial lighting	Throughout quarry operation and restoration works.	No works to be undertaken between sunset and sunrise during period April to October.	Site manager will be responsible.
3.1.2	Seeding/planting of Areas Da and Fa	After infilling of Areas Da and Fa	Optimal time for sowing is Spring or Autumn.	Contractor/quarry staff under guidance of an ecologist.
3.1.3	Tree planting in Areas Da and Fa (5 hawthorn trees in total)	After infilling of Areas Da and Fa	Optimal time for new planting is November – end of February	Contractor/quarry staff under guidance of an ecologist.
3.1.5	Monitoring vegetation establishment and re-seeding etc as necessary.	On-going. After seeding.	Every month during the growing season.	Site manager.
3.7.1	Biological monitoring	Annually for 3 years after start of works and alternate years for the next 4 years.	May to June	Ecologist.

Table 12. Ecological works in relation to Phase 5: 2023 – 2024

Ref.code	Measure	Stage of works	Time of year	Who will undertake work and other details
3.1.6	Remove fencing surrounding Areas Da and Fa so that it returns to grazed common land.	When vegetation has established.	Any	Quarry staff or contractor.

3.4.2	Vegetation clearance in areas of proposed works (north eastern end of bund to be removed).	Prior to commencement of grading works	October to end of February Undertake in the winter before commencing reptile translocation	Quarry staff or contractor.
3.6.1	Erection of reptile fencing around north eastern end of bund.	Prior to commencement of grading works.	Prior to reptile translocation commencing	Quarry staff/ contractor under specific on-site guidance from an ecologist. N.B. If feasible it may be sensible to combine the reptile fencing/translocation in relation to Phases 5 and 6.
3.6.1	Maintaining reptile fencing	Until reptile translocation has been completed and soil has been stripped.	Once a month (or as necessary) whilst reptile translocation is on-going.	Site manager will be responsible.
3.6.2	Translocation of reptiles from north eastern end of bund.	Prior to commencement of grading, but after reptile fence is erected.	April/May to September	Ecologist N.B. If feasible it may be sensible to combine the reptile fencing/translocation in relation to Phases 5 and 6.
3.2.1	Verification survey for badger setts	Prior to grading works	Any time of year. Approximately one month before commencement of works.	Ecologist
3.2.2	Buffer zone around badger setts	Throughout quarry operation and restoration works.	All year.	Site manager will be responsible.
3.4.3	Soil/grassland stripping outside of skylark nesting season.	During	September to February	Site manager will be responsible.
3.3.1	Minimising artificial lighting	Throughout quarry operation and restoration works.	No works to be undertaken between sunset and sunrise during period April to October.	Site manager will be responsible.
3.1.2	Seeding/planting of Area F	After infilling of Area F	Optimal time for sowing is Spring or Autumn.	Contractor/quarry staff under guidance of an ecologist.
3.1.3	Tree planting in Areas F (5 hawthorn trees)	After infilling of Area F	Optimal time for new planting is November – end of February	Contractor/quarry staff under guidance of an ecologist.
3.1.5	Monitoring vegetation establishment and re-seeding etc as necessary.	On-going. After seeding.	Every month during the growing season.	Site manager.
3.7.1	Biological monitoring	Annually for 3 years after start of works and alternate years for the next 4 years.	May to June	Ecologist.

Table 13. Ecological works in relation to Phase 6: 2024 – 2025

Ref.code	Measure	Stage of works	Time of year	Who will undertake work and other details
3.4.2	Vegetation clearance in areas of proposed works (north eastern end of bund to be removed).	Prior to commencement of grading works	October to end of February Undertake in the winter before commencing	Quarry staff or contractor.

			reptile translocation	
3.6.1	Erection of reptile fencing around north eastern end of bund.	Prior to commencement of grading works.	Prior to reptile translocation commencing	Quarry staff/ contractor under specific on-site guidance from an ecologist. N.B. If feasible it may be sensible to combine the reptile fencing/translocation in relation to Phases 5 and 6.
3.6.1	Maintaining reptile fencing	Until reptile translocation has been completed and soil has been stripped.	Once a month (or as necessary) whilst reptile translocation is on-going.	Site manager will be responsible.
3.6.2	Translocation of reptiles from north eastern end of bund.	Prior to commencement of grading, but after reptile fence is erected.	April/May to September	Ecologist N.B. If feasible it may be sensible to combine the reptile fencing/translocation in relation to Phases 5 and 6.
3.2.1	Verification survey for badger setts	Prior to grading works	Any time of year. Approximately one month before commencement of works.	Ecologist
3.2.2	Buffer zone around badger setts	Throughout quarry operation and restoration works.	All year.	Site manager will be responsible.
3.4.3	Soil/grassland stripping outside of skylark nesting season.	During	September to February	Site manager will be responsible.
3.3.1	Minimising artificial lighting	Throughout quarry operation and restoration works.	No works to be undertaken between sunset and sunrise during period April to October.	Site manager will be responsible.
3.1.2	Seeding/planting of Area G	After infilling of Area G	Optimal time for sowing is Spring or Autumn.	Contractor/quarry staff under guidance of an ecologist.
3.1.3	Tree planting in Areas G (5 hawthorn trees)	After infilling of Area G	Optimal time for new planting is November – end of February	Contractor/quarry staff under guidance of an ecologist.
3.1.5	Monitoring vegetation establishment and re-seeding etc as necessary.	On-going. After seeding.	Every month during the growing season.	Site manager.
3.7.1	Biological monitoring	Annually for 3 years after start of works and alternate years for the next 4 years.	May to June	Ecologist.

Table 14. Ecological works in relation to Phase 7 (final restoration phase): 2025 and on-going

Ref.code	Measure	Stage of works	Time of year	Who will undertake work and other details
3.2.1	Verification survey for badger setts	Prior to commencement soil grading works (e.g. bund removal)	Any time of year. Approximately one month before commencement of works.	Ecologist
3.2.2	Buffer zone around badger setts	Throughout quarry operation and restoration works.	All year.	Site manager will be responsible.
3.3.1	Minimising artificial lighting	Throughout quarry operation and restoration works.	No works to be undertaken between sunset and sunrise during period April to October.	Site manager will be responsible.

3.1.4	Pond creation in bowl of quarry			
3.1.2	Seeding/planting of remaining areas (Areas C, Db, H and I)	After final grading works undertaken.	Optimal time for sowing is Spring or Autumn.	Contractor/quarry staff under guidance of an ecologist.
3.1.3	Tree planting in Areas F (5 hawthorn trees)	After final grading works undertaken.	Optimal time for new planting is November – end of February	Contractor/quarry staff under guidance of an ecologist.
3.1.5	Monitoring vegetation establishment and re-seeding etc as necessary.	On-going. After seeding.	Every month during the growing season.	Site manager.
3.1.6	Remove fencing surrounding all areas so that it returns to grazed common land.	When vegetation has established.	Any	Quarry staff or contractor.
3.7.1	Biological monitoring	Annually for 3 years after start of works and alternate years for the next 4 years.	May to June	Ecologist.

5. References

Documents:

Baker, J., Beebee T., Buckley, J., Gent, T. and Orchard, D. (2011). *Amphibian Habitat Management Handbook.* Amphibian and Reptile Conservation, Bournemouth.

Eaton, M., Brown A., Noble D., Musgrove A., Hearn R., Aebischer N., Gibbons D., Evans A., and Gregory R. (2009) *Birds of Conservation Concern 3*: *The Population Status of Birds in the United Kingdom, Channel Islands and the Isle of Man.* British Birds 102, pp296-341.

Edgar P, Foster J. And Baker J (2010) *Reptile Habitat Management Handbook,* Amphibian and Reptile Conservation

Websites:

Google Earth, 2013

www.britishflora.co.uk

www.floralocale.co.uk

www.nhbs.com

www.reallywildflowers.co.uk

www.wildflowershop.co.uk.

www.wildseed.co.uk

6. Appendices

Appendix 1. Plan Showing Quarry Location and Extension Area

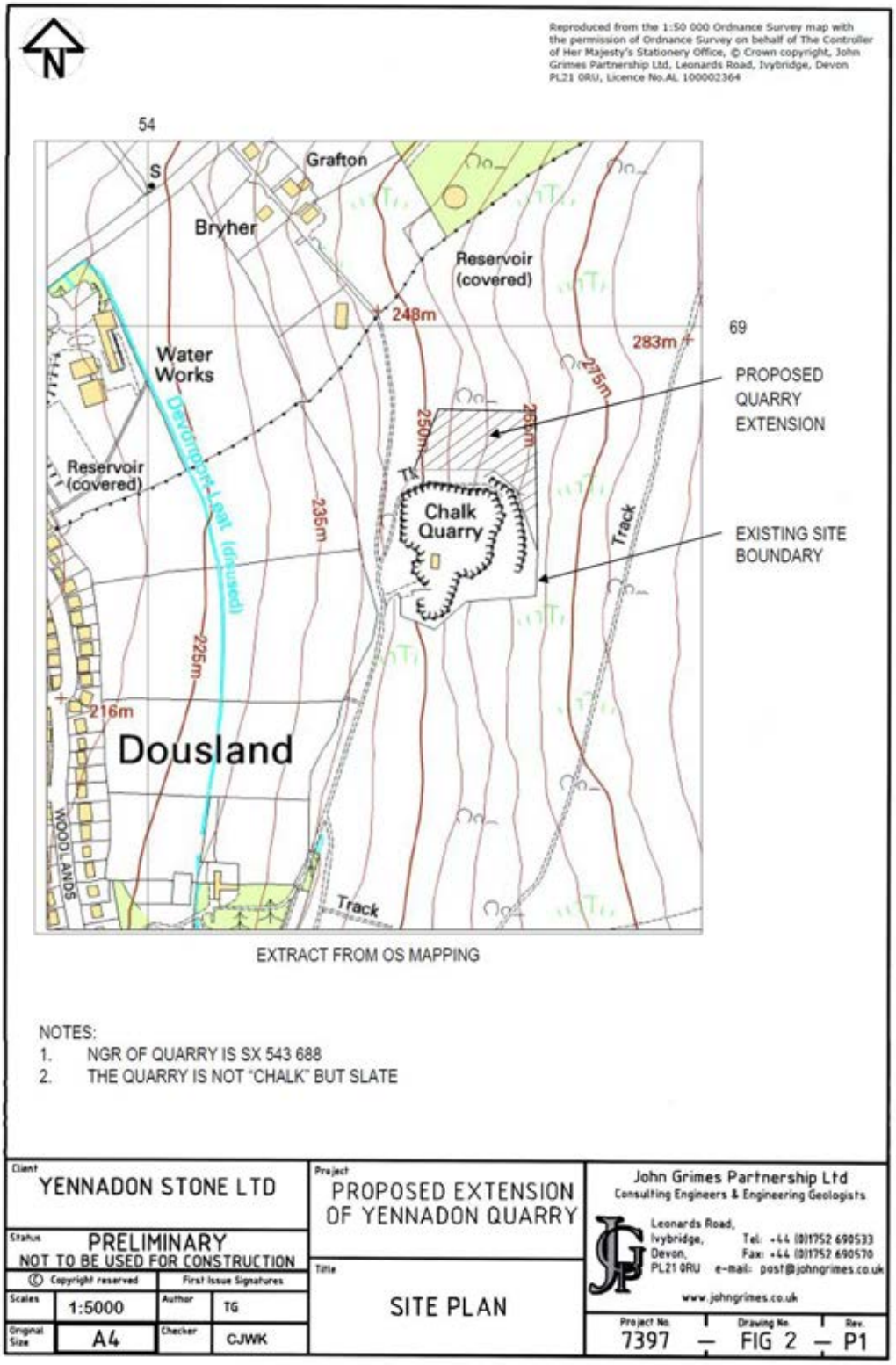

Figure 1. Location plan showing proposed extension (provided by John Grimes Partnership Ltd).

Appendix 2. Badger Buffer Zone

Figure 2. Existing badger sett locations and 50m buffer zone in which no works will be undertaken (including vehicle movement, excavation and storage of materials). Site Manager will be responsible for this.(Source: Google Earth, 2013)

Appendix 3. Reptile Fence Details

Figure 3. Map showing approximate location of reptile fencing for each phase based on *drawings 7397/06 – 7397/11 dated 24 May 2013, produced by John Grimes Partnership Ltd This will need to be reviewed and discussed with an ecologist prior to erection.*

Reptile Fences

The aim of a reptile fence is to prevent reptiles from re-colonising the development site once they have been removed.

The fence should be made from thick polythene (e.g. 1200 gauge), which is about 60cm high and is also buried into the ground so that reptiles cannot get under the fence. There should be an overhang of polythene at the top, (facing out from the development site) so that it is very difficult for reptiles to climb back into the development site. A 1m margin should be mown/ strimmed on the outside of the fence so that reptiles cannot use tall vegetation to climb back in.

The polythene should be supported by wooden posts. If the fence is in an exposed position, wire can be attached between the posts for added support.

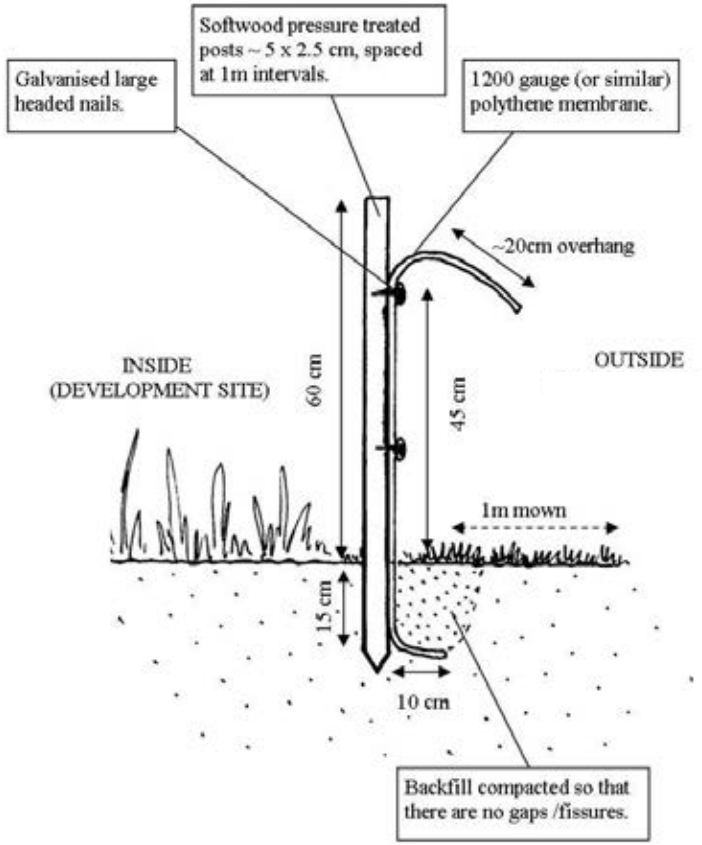

Figure 4. Information relating to the construction of a reptile fence