

DARTMOOR NATIONAL PARK AUTHORITY  
DEVELOPMENT MANAGEMENT COMMITTEE

7 October 2011

CONSULTATIONS BY NEIGHBOURING LOCAL AUTHORITIES

Report of the Director of Planning

Recommendation: That the Committee notes the response(s) made under delegated powers

1     Grid Ref:     SX520931             District/Borough:     West Devon  
       Officer:     James Aven             Parish:             Bratton Clovelly  
       Proposal:     Installation of 1MW ground mounted photovoltaic modules  
       Location:     Pittsworthy Farm, Thorndon Cross, Okehampton  
       Response:     NO OBJECTION

Pittsworthy Farm is located approximately 3km north west of Sourton Down and the National Park boundary. This consultation is in respect of an application for the installation of 54 arrays of ground-mounted photovoltaic units, each with 93 PV modules at a maximum height of 3.6m and arranged in 14 rows of varying length.

All but one side of the application site is bounded by mature trees and it is proposed to replant the remnant hedgebank along the eastern boundary. The arrays are to be located so that they do not impact on the tree root systems and allow for canopy growth over the lifetime of the proposal.

Devon Structure Plan Policy CO2 states that development outside the National Park must not damage the natural beauty, character and special qualities of the National Park. Whilst it will be possible to view the northern most part of the site at a distance from the high moor, it is unlikely to have a significant or unacceptable impact due to the small proportion of the installation that will be visible (about 11 of the 54 arrays), the distances involved and location of the solar farm to the north west of the National Park on low lying and relatively well screened ground. It is considered that the setting of the National Park will not be significantly harmed by the proposed development.

Whilst raising no objection, the Authority has asked that the mature trees along the southern boundary of the site be protected in order to maintain the screen that they currently provide. The proposal to reinstate and replant the remnant hedgebank along the eastern boundary of the site was also welcomed.

At its meeting on 13 September 2011, the Members of West Devon Borough Council's Planning and Licensing Committee resolved to hold a site inspection on 21 September, with a view to considering the application again at its meeting on 11 October 2011.

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2	Grid Ref:	<b>SX539946</b>	District/Borough:	<b>West Devon</b>
	Officer:	<b>Christopher Hart</b>	Parish:	<b>Okehampton</b>
	Proposal:	<b>Extension to provide 30 additional hotel bedrooms and dining room extension</b>		
	Location:	<b>Ashbury Golf Club, Higher Maddaford, Okehampton</b>		
	Response:	<b>NO COMMENT</b>		

Ashbury Golf Club is situated approximately 4km west of Okehampton and approximately 2km from the National Park boundary.

The Golf Club is a well established facility that already benefits from on-site accommodation and club house facilities.

The proposed extensions will have no impact on National Park interests. As a consequence the Authority has made no comment on the application.

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3	Grid Ref:	<b>SX737655</b>	District/Borough:	<b>Teignbridge</b>
	Officer:	<b>Dan Janota</b>	Parish:	<b>Buckfastleigh</b>
	Proposal:	<b>Construction and operation of Materials Reclamation Facility and Incinerator Bottom Ash processing facility, and removal of dolerite outcrop</b>		
	Location:	<b>Whitecleave Quarry, Buckfastleigh</b>		
	Response:	<b>That the Authority objects to the application on the grounds that it may impact upon the integrity of the South Hams Special Area of Conservation (SAC)</b>		

### Introduction

The proposal site is Whitecleave Quarry, an area adjoining the National Park at Buckfastleigh and the application is being determined by Devon County Council. An Environmental Statement (ES) has been submitted alongside the application, which comprises the following:

- o **Materials Reclamation Facility (MRF)**

The MRF to the north of the site will receive and process construction and demolition waste from the operator's main business. This will take place in a Sorting Unit where inert waste arriving at the site is fed via excavator to a conveyor and hand sorted into

appropriate bays. Material suitable for mixing as an aggregate product will be crushed within the quarry void area where it will then be stockpiled.

- o Incinerator Bottom Ash (IBA) processing facility

This facility will process the residual IBA from the proposed Energy from Waste Combined Heat and Power Plant at Devonport, Plymouth into a useable product. Material will arrive where it is kept in storage bays for 3-6 weeks, during this time it is kept wet and forms a crust. After this 'maturation' process the material is screened and sized in the IBA Processing Building before being stored in the quarry void.

- o The removal of a dolerite (rock) spur and infilling of the existing quarry void

It is proposed to remove an area of rock adjacent to the quarry void; this will create a level area for the IBA facility and provide up to 300,000 tonnes of rock. This rock will be used initially to infill the void, and will then be mixed with material from the MRF and IBA facility to provide a marketable aggregate product. In time it is proposed to backfill the quarry void with material from the MRF with a view to eventually relocating the MRF into the main quarry area (subject to a future application).

#### **Air quality, dust, odour and noise**

Key matters of air quality, dust, odour and noise as a result of both the construction phase and the operation of the site are of concern to local residents and material considerations in the determination of the application. Matters of Environmental Health have been considered in the ES, key issues include:

- Air quality and odour – including emissions from traffic, operation of the site and in particular public concerns regarding odour from the IBA processing.
- Dust – arising from the general operation of the site (e.g. use of vehicles on un-metalled roads), movement and crushing of materials, and removal of the rock spur.
- Noise and vibration – e.g. through the general operation of the site (movement of vehicles etc), loading and unloading of wagons, conveyors etc, operation of machinery and blasting of the rock spur in phase 1.

In respect of this Authority's involvement in the above issues they are material planning matters and have the potential to impact upon the environment and local community within the National Park. However the Authority does not have the expertise to assess such matters and usually would look to the District Council for advice. As such in this consultation it is advised that the Authority defers to the expert advice of Teignbridge District Council and any advice from the Health Protection Agency in respect of matters of environmental health. This has been agreed with the Environmental Health Officer (EHO) who at the time of writing had not yet prepared a response to the County Council. It is important to consider that issues such as odour, dust, noise and vibration should be assessed in the context of their impact upon the enjoyment of the special qualities of the National Park. In this context a more challenging threshold of what might be considered acceptable may be appropriate. Similarly any adverse impact on Buckfastleigh itself should be considered by the District Council EHO.

## Traffic

The site is accessed via a private road under the A38 from the B3380 (Strode Road/Plymouth Road), shared with a coach storage area. From here access to the A38 is via the Lower Dean junction (1.1km to the south) or the Dart Bridge junction (1.9km to the north). The ES shows that the highest number of trips will occur during the operation, rather than construction of the facility. This is estimated at 63 daily trips (two-way journeys) and constitutes an increase in overall traffic of up to 4.8% during operation (post 2016). Whilst the overall increase in traffic is less than 5% the increase in HGV movements on the road is assessed as up to a 70% increase in one location on the B3380. Whilst the ES concludes that this is not significant a clearly perceptible increase in HGV movements is likely to impact upon the amenity of residents of properties close to Strode Road and Plymouth Road.

It is difficult to judge whether this impact is significant and the Authority would expect the County Council's Highway Officer to provide a response on the assessment, and the acceptability of the proposal both in terms of capacity and impact on local residents. What is clear is that a significant number of residential properties along Strode Road and Plymouth Road will be affected by additional traffic movements.

## Socio-economic considerations

The operation is estimated to create 12 new jobs; it may also provide other opportunities indirectly, for example through sub-contracted maintenance.

The ES has assessed the potential impact of the proposal upon local tourism. It concludes that the development does not present any significant threat to the tourism sector on the basis that the impacts of the proposal (such as visual impact, noise, traffic) are assessed as acceptable in the ES. The potential impact upon the local economy and in particular tourism, are of concern locally, however. It is important therefore to consider the *perception* of impact, which itself could affect the vitality and viability of Buckfastleigh by influencing decision making in the area. Such impacts are very difficult to assess, however.

In providing additional employment opportunities in both skilled and non-skilled roles the benefits of the proposal to the local community are clear. Whether the proposal impacts adversely upon the local economy, including tourism, is dependant on the conclusion that other issues such as visual impact, noise, traffic etc individually and cumulatively, are assessed as not having a significant impact. Provided the County Council can conclude that these issues are considered to be acceptable it is considered on balance that the potential economic benefits of the proposal would outweigh any potential adverse effects upon the local tourist economy. Should any of these issues be considered to have a potential significant impact however, this must then also be judged against the potential wider socio-economic impact upon this part of the National Park.

## Habitats and protected species

The site is approximately 600m from the Buckfastleigh Caves Site of Special Scientific Interest (SSSI) within the National Park, this site forms part of the South Hams Special Area of Conservation (SAC); a site of European importance designated for its population of greater horseshoe bats. Part of the site is also within the Potter's Wood SSSI, designated also for greater horseshoe bats.

The Authority's Ecologist disagrees with the applicant's conclusion that the proposed development would not impact upon greater horseshoe bats and thus the SAC, this is specifically due to:

- Habitat loss and mitigation - particularly inadequacies in the provision of new hedgerow planting
- Lighting levels - a proposed level which significantly exceeds best practice and would likely have a detrimental impact upon commuting bats
- Blasting - whilst this has been subject of some debate the current proposals are not considered to be acceptable in respect of [the time of year for blasting] which would not minimise impact upon bats
- Monitoring - there is no clear monitoring strategy for the impact upon bats
- Impact on Potter's Wood SSSI - specifically hydrology, and the consequential impact upon the South Hams SAC bat population.

The above concerns are echoed by Natural England in its response to the County Council.

In addition to concerns regarding the greater horseshoe bat, impacts upon a barbastelle bat maternity roost within the National Park are not considered to have been adequately assessed. A radio-tracking study indicates that barbastelle bats, known to originate from one of the two maternity colonies within the National Park, are foraging in close vicinity to the quarry. The ES does not adequately assess whether the proposal could have an impact upon the bat colony within the National Park.

Lastly it is noted that the ES has identified that the proposal may impact upon water quality in the Dean Burn. The Dean Burn is a tributary of the River Dart which is a migratory route for salmon, an interest feature of the Dartmoor SAC. Whilst it is noted that the operation will require an Environmental Permit from the Environment Agency, the potential impact of adverse water quality upon the Dart needs to be assessed in order to determine it will not impact upon the Dartmoor SAC.

### **Landscape and visual impact**

The main quarry area sits in an elevated location above the town; the A38 is, at that point, also elevated and separates the site from the town (as well as marking the boundary of the National Park). The quarry is visible from a large number of locations around the town and surrounding landscape, particularly in residential areas towards the southern end of Buckfastleigh. The site is, however, well surrounded by woodland, the visible quarry face is weathered and 'greening up', and the aspect of the site also means it is often in shadow, making it appear less prominent in the hillside.

The Materials Reclamation Facility (MRF) is proposed at the north edge of the site. This area is outside of the quarry void and, whilst elevated, is screened by some existing broadleaf tree cover. The visual impact of the MRF is not considered to be significant.

The proposed development of the site includes the removal of a large spur of rock at the western edge of the quarry void in order to create a level area for the IBA plant. The removal of this spur is a key consideration in the proposal as it plays a role in screening views into the quarry site, and reduces the impact of noise, dust and light trespass from the site. The spur is covered with broadleaf trees which limit the views into the quarry and sit behind a lower area of coniferous screening.

Even with the elevated quarry floor the IBA plant would be visible from only a very small number of locations and its impact is not considered significant. The removal of the spur would however reduce the perception of enclosure of the site. Its removal would reduce the amount of vegetation around the quarry edge and expose a larger area of the previously worked quarry face to views, thus making the site more noticeable in the landscape.

It is considered that the proposed planting "to reduce the impact of the development on the local and distant views" will have minimal benefit. This will be carried out on relatively thin bunds which will not give a sufficient depth of planting to provide robust screening. Due to the proposed location and techniques the likely success of the proposed planting schemes is viewed with some skepticism.

Whilst it is recognised that the removal of the spur will have an adverse visual impact, and that planting will do little to mitigate the visual impact of the development, the remaining impact is not considered to be significant. The overall degree of impact of the development is not considered such as to have a detrimental impact upon the setting of, or views out of the National Park. It is however considered that alternative ways of laying out the site, and opportunities for mitigation, have not been adequately assessed. If minded to approve the application a more detailed consideration of the following by the County Council, would therefore be requested:

- Improvements to the existing planting to the west of the proposed MRF in order to provide a thicker screen year-round
- Detailed justification of the amount of space required for the IBA plant to ensure the amount of the spur being removed is the absolute minimum
- The need to infill the quarry void to the level of the site entrance – a lower level would retain a greater degree of enclosure mitigating both visual and noise/light/dust impact
- The robustness of planting schemes and their management with a view to providing and sustaining natural screening
- Potential for off-site benefits in compensation for the impacts of the development, in particular improvements to the screening of the A38 in this location would reduce visual and noise impact, and improve the approach to and setting of the Buckfastleigh Conservation Area.

It is important to note that the consideration of robust schemes for planting and lighting has the potential to mitigate visual impact as well the impact upon bats. Also that more robust planting and screening could reduce the escape of noise and dust from the site.

### **Community representations**

Whilst this is a consultation by a neighbouring authority, officers have received correspondence on this application from Buckfastleigh residents. 17 letters have been received requesting the Authority object to the application. A petition with 323 signatures has been received stating the Authority should object as "the development would have an unacceptable impact upon:

- The landscape character of the area, and the setting of Dartmoor National Park, and
- habitats and protected species within Dartmoor National Park, and
- the health and wellbeing of communities within Dartmoor National Park."

## Conclusion

The application raises a number of concerns, namely:

- Environmental impact, particularly noise, dust and air quality
- Highway impact from additional HGV movements
- Socio-economic impact on tourism in the Buckfastleigh area
- Habitats and protected species
- Landscape and visual impact

In terms of impact on the National Park, it is considered that the Authority should object to the application with regard to the impact on habitats and protected species and raise concerns regarding other matters listed above unless the relevant consultees can assure the County Council that any harmful impact is either not substantive, or can be successfully mitigated against. The County Council should also refer to the detailed landscape comments set out above and take these into consideration.

In the event of any approval the County Council should satisfy itself that appropriate conditions and/or legal agreements can be legally imposed and will be sufficient and robust to ensure the proposed development can be satisfactorily implemented and properly controlled in the longer term. The National Park Authority would also wish to be a party to any discussions regarding potential S106 community benefits that may accrue from the development.

A copy of this report will be forwarded to the County Council with a letter of objection.

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STEPHEN BELL

Mrs S Penaluna  
Devon County Council  
Lucombe House  
County Hall  
Topsham Road  
EXETER EX2 4QW

Your ref: DCC/3242/2011  
**Please quote: DJ/**  
Direct line: 01626 831066

7 October 2011

Dear Sue

**Construction of materials reclamation facility, Incinerator Bottom Ash recycling facility and removal of dolerite outcrop, Whitecleave Quarry**

At its meeting today the Development Management Committee of the Dartmoor National Park Authority discussed the above application. Please find attached copy of the report and response agreed by Members. I would, in addition to the report, have several points to stress in our response on behalf of both officers and Members; these are as follows.

**Habitats and wildlife**

Principally the Authority is concerned with the potential impact upon the South Hams Special Area of Conservation (SAC). The Authority would question the applicant's conclusion that the proposed development would not impact upon greater horseshoe bats and thus the SAC, this is specifically due to:

- Habitat loss and mitigation - in particularly inadequacies in the provision of new hedgerow planting
- Lighting levels - a proposed level which significantly exceeds best practice and would likely have a detrimental impact upon commuting bats
- Blasting - whilst this has been subject of some debate the current proposals are not to be considered to be acceptable in respect of the time of year for blasting which would minimise impact upon bats
- Monitoring - there is no clear monitoring strategy for greater horseshoe bats
- Impact on Potter's Wood SSSI - specifically hydrology, and the consequential impact upon the South Hams SAC bat population.

It is understood that the County Council, as competent Authority, is carrying out Appropriate Assessment. This Authority's objection would stand unless this assessment concludes that the development would not impact upon the integrity of this European site; any outstanding concerns should be considered in the context of Policy CO2 of the Devon Structure Plan.



### **Site arrangement and mitigation**

This Authority would consider that the layout of the site has not been clearly justified, that alternative arrangements for the layout of the site have not been fully considered, and that opportunities for mitigation have not been fully explored. It is important that there is clear justification for amount of space required, and size of building needed for each element of the operation. This is important in identifying the minimum amount of stone to be removed from the rock spur, and thus retaining as much natural screening as possible.

In respect of mitigation this Authority is concerned that preparatory planting work undertaken by the applicant is of very limited success. It is considered that a more robust planting scheme with clear management arrangements should be required. Areas where this should be considered are:

- To the north west of the proposed MRF – a thicker screen could be provided through removal of the existing containers
- The area referred to as the 'bat mitigation bund' – could be significantly improved with a wider area of planting
- A clear scheme for the management of the area to the west of the bat mitigation bund, and below the access track needs to be provided (in order to address any opportunities to better screen this area, and manage the eventual loss of the coniferous tree cover).

### **Environmental Health**

Matters of dust, noise, vibration and light pollution are of significant concern to the local community. Such matters have the potential to impact upon the special qualities of the Dartmoor National Park. This Authority does not have the expertise to assess the impact of such issues and will rely on the Environmental Health Officers and Teignbridge District Council to advise the County Council. However, this Authority would support any concerns that the District Council may raise where they may have an impact upon the National Park in the context of policy CO2 of the Devon County Structure Plan.

### **Traffic**

The same comments would apply as above; this Authority would welcome the advice of the County Council's Highways Officer in respect of this proposal.

### **Conclusion**

Finally I would draw your attention to the last paragraph of the attached Committee Report. If minded to approve the application this Authority would seek robust conditions and/or legal agreements to secure the successful implementation and long term control of the operation. Also the Authority would wish to be a party to any discussions regarding potential S106 community benefits that may accrue from the development.

I would be grateful if the above comments could be taken into consideration in the County Council's determination of the application. If you would have any queries or comments on the response please do contact me.

Yours sincerely

Dan Janota  
**Planning Officer (Forward Planning)**  
Email: [djanota@dartmoor-npa.gov.uk](mailto:djanota@dartmoor-npa.gov.uk)

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**From:** Naomi Barker  
**Sent:** 07 November 2011 11:28  
**To:** 'tamsin.wray@scottwilson.com'  
**Subject:** Barbastelles and Whitecleaves

Hi Tamsin

Dan Janota informs me you are having trouble obtaining the barbastelle data we made reference to in our neighbouring authority response to the proposals at Whitecleave Quarry?

After I noted that the matter of barbastelles hadn't been picked up by yourselves and was not mentioned in the desk top search, I queried with DBRC whether the barbastelle data, which we had provided to them for use in data searches in 2009, was being distributed.

It turned out that it wasn't as the data apparently wasn't in a format that was usable to the public – something I was unaware of, I was under the assumption that the data we had sent to the DBRC was now in the public domain. Anyway, we sorted out the format of the data to make it usable by the public and I am informed it should now be available on request from the DBRC. If you still have problems getting the data please let me know and I will see if I can dig it out of our files again.

Best wishes  
Naomi

Naomi Barker  
Ecologist  
Dartmoor National Park Authority  
Parke  
Bovey Tracey  
TQ13 9JQ  
01626 832093

Susan Penaluna  
Planning Officer (Development Management)  
Devon County Council  
Lucombe House  
County Hall  
Topsham Road  
Exeter  
EX2 4QW

Our Ref: D134633

Your Ref: sp/dcc/3242/2011

Date: 10 January 2012

Dear Sue,

**APPLICATION FOR PLANNING PERMISSION – TOWN AND COUNTRY PLANNING ACT 1990  
CONSTRUCTION AND OPERATION OF AN IBA PROCESSING FACILITY AND MRF AT  
WHITECLEAVE QUARRY, BUCKFASTLEIGH.**

**RESPONSE TO DARTMOOR NATIONAL PARK AUTHORITY – BARBASTELLE BATS**

Our Principal Ecologist, Simon Geary, has reviewed the research paper on barbastelle bat radio tracking supplied by Dartmoor National Park Authority (DNPA) on 15 November 2011 and has made the following observations and conclusion on potential impacts of the scheme on barbastelle bats.

The radio tracking identified core foraging areas (CFA) for bats roosting in several woodlands with Dartmoor National Park. None of the CFA include or occur close to Whitecleave Quarry or its immediate surrounding woodland habitat. It is acknowledged that the maximum foraging ranges of several bats occur within 1 km of Whitecleave Quarry and by interpolation/extrapolation it is possible to conclude that a small number of bats may commute or forage through/around woodland on/bordering the quarry. Indeed, bat activity surveys undertaken by Devon Wildlife Consultancy (DWC) detected five registrations of barbastelle during a survey on 27 August 2009 but not on any other surveys (DWC Report 09/047: Bat Activity Monitoring Survey 2009 & 2010 – Whitecleaves Quarry, Buckfastleigh – Appendix 7.5 to ES) which proved the species occasionally occurs on site, but it is not possible to conclude that this record was of a bat from the Dartmoor study sites. The five registrations were recorded within 20 minutes along the eastern periphery of the quarry site and nowhere else on site. The pattern of timing of these records would indicate that the surveyor recorded subsequent registrations as they walked along the eastern periphery but no indication was given about whether this represents commuting or foraging and the actual number of bats involved cannot be deduced. However, the species was not regularly recorded during DWC activity surveys indicating that the site is not part of a CFA for this species.

The amount of broad-leaved woodland being removed to facilitate the proposed development is approximately 0.37 ha, which represents a small proportion of the woodland habitat available to barbastelle bats within the Dartmoor study area or available to any other individuals of the species. Aside habitat loss, the proposed development will require artificial lighting but this has been carefully designed to avoid impacts on greater horseshoe bats and should therefore not adversely affect other bat species. In our opinion, the impacts of the scheme - principally small-scale woodland habitat loss - on barbastelle bat are therefore minimal and unlikely to result in a significant effect on the conservation status of the species.

Scott Wilson Ltd  
3rd Floor, Mayflower House  
Armada Way, Plymouth, Devon  
PL1 1LD, United Kingdom  
Tel: +44 (1752) 676 700  
Fax: +44 (1752) 676 701  
www.urs-scottwilson.com

Scott Wilson Ltd  
Registered in England: No 880328  
Registered Office: Scott House, Alençon Link, Basingstoke, Hampshire, RG21 7PP, United Kingdom



If you have any queries about this matter, please do not hesitate to contact me.

Yours sincerely  
for **URS Scott Wilson Ltd**

A handwritten signature in black ink, appearing to be 'I. Roach', written in a cursive style.

**Ian Roach**  
Principal Environmental Planner

Telephone: +44 (0)1752 676728  
email: [Ian.Roach@urs.com](mailto:Ian.Roach@urs.com)

CC (by email)  
Naomi Barker – DNPA  
Andrew Smith – MVV  
Bruce Braithwaite – MVV  
Simon Geary – URS Scott Wilson  
Tamsin Wray – URS Scott Wilson

**Extracts from 'Dartmoor Report 2009' on Fly by Night - *Barbastelle*  
Radiotagging Research Project, Matt Zeale**

**2.1 Study area**

Study areas were defined on the basis of home ranges and where bats utilised roosts that were separated by a distance of at least 5km. *B. barbastellus* were studied at four areas in and around Dartmoor National Park, Devon, England. Study areas were based around the following woodland roosting sites identified during this study: Site A: Houndtor Wood (3°44' W, 50°36' N), Site B: White Wood (3°51' W, 50°32' N), Site C: Hembury Wood (3°47' W, 50°30' N), and Site D: Dendles Wood (3°56' W, 50°26' N) (Fig. 1). The term 'home wood' is hereafter used to describe woodland roosting sites. Home wood area was calculated using the minimum convex polygon (MCP) of all bat locations (obtained from radiotracking data) within a wooded area that was contiguous with the woodland in which day roosts were recorded. Home wood boundary was delimited by woodland edge and the MCP.

Bats were caught using mist nets and harp traps placed along tracks and rides within woodlands, and by using hand nets when bats emerged from known tree roosts. Nets and traps were erected prior to the predicted emergence of bats and remained in place typically for 6 hours in woodlands or until all bats had emerged at tree roosts. An acoustic lure was used (not at roosts) to improve catch efficiency (Hill & Greenaway, 2005). Suitable woodland trapping sites were selected based on the habitat structure of the woodland and using bat presence records from previous surveys. Adult female *B. barbastellus*, after capture and an assessment of condition were fitted with lightweight radio-transmitter tags (Pip3, 0.35g) (manufactured by Biotrack Ltd, UK). After clipping the fur, tags were attached on the dorsal side of the animal to the area between the scapulae using Skin Bond (Pfizer Inc.), a form of biodegradable glue. Transmitters weighed on average 4.4% (range 4.0–4.9%) of the body mass of tagged individuals. Pregnant females and juveniles were considered to be particularly sensitive to the added weight of transmitters and therefore were excluded from this process. All tagged bats were fitted with rings to allow identification of recaptured individuals and prevent repeated tagging of a single bat in the same year. All activities were conducted under Natural England license. Using a Biotrack Sika receiver (Biotrack Ltd, UK) and a three-element Yagi antenna (Mariner Radar, UK) bats were tracked and located after release using continuous tracking methods (Jones and Morton, 1992; Duvergé, 1996) for an average of 2.53 nights per bat ( $n = 19$  bats). Due to lack of sufficient manpower and resources, and the rapid flight of bats, it was not possible to determine the location of a bat in the field, hereafter known as a 'fix', using triangulation (Kenward, 2001), whereby two field workers co-ordinate simultaneous bearings. Therefore the 'homing-in' method (White and Garrott, 1990) was applied, whereby fixes were established by following the signal by car or on foot until it became very strong and almost non-directional. Bat locations were recorded every 4–10 minutes, depending on how fast the bat was moving, to allow for an approximation of the bat's flight path to be identified. For each data point tracker location was recorded to a ten figure grid reference (British National Grid) using a GPS (Garmin e-trex, 5–15m accuracy) and the direction of peak signal was recorded using a compass. The distance from tracker to bat was estimated based on the gain used on the receiver and the signal strength. Activity type was determined by the nature of the signal: a rapid directional signal indicating commuting, a signal fluctuating within a defined area indicated

foraging, and a static uni-directional signal was identified as roosting (Russo et al., 2002; Davidson-Watts and McKenzie, 2006). Any night of data resulting from less than 95% contact time with a bat was excluded from final analyses as the complete pattern of movements throughout the night could not be identified. All radio-transmitters had an average life expectancy of two weeks.

#### *2.4 Analysis of ranges and foraging areas*

Using observer location, bearing, receiver gain and signal strength, bat fixes were digitised using ArcGIS 9.2 (ESRI, Inc.) and Distance/Azimuth Tools (version 1.6) extension (Jenness Enterprises). Once digitised, all radiotracking data were analysed in Ranges 7 (Anatrack Ltd, UK).

Using continual tracking methods denser accumulations of fixes are generated when a bat is moving short distances over a long period of time (during foraging), compared to when it is moving quickly over large areas (during commuting), therefore cluster analysis (Kenward, 1987) was considered the best method to represent true foraging areas (Davidson-Watts et al., 2006). Other analyses, such as ellipses, harmonic mean and kernel analyses could not be used as these techniques used parametric assumptions when interpreting the location of fixes; since fixes could not be recorded at regular time intervals due to the constraints of the homing-in method it was not possible to provide the independent location density estimators required for such tests (Kenwood, 2001). Analysis of utilisation distribution discontinuities, from 100% to 30% in 5% intervals, found that up to 20% of fixes from each bat increased the size of the range disproportionately. Examination of these fixes revealed that they were primarily recorded as bats commuted from the home wood to core foraging areas. Thus 80% cluster cores were used to assess the habitat in which bats were foraging.

100% minimum convex polygons (MCPs) were calculated both for individual home ranges (delimiting all fixes corresponding to each bat) and for the total colony area (delimiting all fixes from all colony members), hereby referred to as individual and combined MCPs respectively. Individual MCPs have previously been used as an assessment of the total area available to foraging bats (e.g. Davidson-Watts et al., 2006). In this study however, home ranges between colony members varied enormously and there appeared to be no restrictions on a bat's movements from landscape features that might shape individual MCPs. Therefore a combined MCP was considered a more truthful representation of the total area of habitat available to foraging bats. Individual MCPs are however included here for comparison with previous studies.

#### *2.5 Analysis of spatial organisation*

Spatial organisation among *B. barbastellus* was studied using the static interaction of overlapping home ranges (individual MCPs) and foraging areas (80% cluster cores) (Kenward, 2001; Knight, 2006).  $a/A$  was used as a measure of the overlap, where an individual MCP or 80% cluster core of area 'A' has an area 'a' overlapped by a foraging area of the same type by a different individual. The mean of overlaps was calculated for all tracking data at site A (Houndtor) from 2007, from 2008, and 2007 and 2008 combined. 80% cluster cores were also split into those within the home wood (inner cores) and those outside of the home wood (outer cores) to distinguish between areas of high and low overlap.

#### *2.6 Analysis of habitat preference*

Habitat preference was investigated by comparing the habitat composition of areas in which each bat foraged (80% cluster cores) to that available (combined MCP) (e.g. Russo et al., 2002; Flanders, 2008). The used and available habitat compositions were compared using compositional analysis (Compositional Analysis Plus Microsoft Excel tool 6.2, Smith Ecology Ltd, UK) according to the methods of Aebischer et al. (1993) to determine initially whether habitats were used in line with availability or if selection was occurring, and secondly to determine the ranking of habitat types.

### 2.7 Analysis of nocturnal activity

A number of temporal features of nocturnal activity were extracted from radiotracking data and analysed to determine trends in activity among colony members. Mean activity was calculated for all sites where the number of bats tracked was > 1 by using the mean of multiple nights of data for each bat.

### 2.8 Roost identification

Using the same radiotracking equipment described in 2.2 bats were located during the day to identify the tree in which they were roosting. The specific roost feature on each tree was identified using a directional antenna and observation with binoculars from the ground. Roost features were usually identified correctly using these methods, particularly when a tree supported few suitable roost features. Roost features were confirmed by conducting emergence counts at dusk, which also provided an assessment of the number of bats that utilised the feature and an estimate of colony size. The GPS location of each tree roost was recorded as well as observational data regarding roost specification and the surrounding habitat. Where possible, all bats were located daily within roosts for the length of the tag-life to identify patterns of roost switching among colony members.

## 3. Results

### 3.1 Capture data

In total, 28 catch attempts in 9 woodland sites were made during the two year study (Appendix 2). 12 bat species were recorded on Dartmoor during this period including the UK BAP species *Pipistrellus pipistrellus*, *Rhinolophus ferrumequinum*, *Rhinolophus hipposideros*, *Myotis bechsteinii*, and *Barbastella barbastellus*. 24 *B. barbastellus* were recorded in 8 of the woodland sites surveyed (Appendix 1). Two previously unidentified *B. barbastellus* maternity colonies were located at sites A (Houndtor) and B (White). A previously identified maternity colony at site D (Dendles) (Billington, 2003a, 2003b) was located within the same wood. Emergence counts at each site revealed a minimum colony size of 28 *B. barbastellus* at site A, 23 at site B, and 11 at site D. The single *B. barbastellus* caught at site C (Hembury) roosted alone for the duration of the tracking period, therefore the presence of a maternity colony at this site was not confirmed.

### 3.2 Radiotracking data

During the two-year study data were obtained from fourteen *B. barbastellus* at site A (Houndtor), three at site B (White), one at site C (Hembury), and one at site D (Dendles) (Table 1). Due to the spread of data across four study sites and the requirement to treat sites independently, only data from site A (Houndtor) ( $n = 14$ ) were used to calculate home ranges and foraging areas, in compositional analysis to determine habitat use, and in the assessment of spatial organisation and nocturnal

activity. The average number of fixes ( $\pm$  SD) per individual was  $185.50 \pm 42.80$ . All individuals included in the analyses were radiotracked between July and September when bats were of post-lactating or non-breeding status. Data on the remaining five individuals (from sites B, C and D) are summarised in corresponding tables and referred to in the discussion for comparison and to determine whether the data from Site A was representative of the study area in general.

### 3.3 Ranges and foraging areas

*B. barbastellus* showed a large variability in both maximum foraging range (distance from roost to furthest edge of core foraging area; calculated as the mean of nights for each bat) and MCP size among colony members (Table 2). Individual mean maximum foraging range varied from 3.16 to 20.38km (mean  $\pm$  SD:  $8.45 \pm 4.89$  km) and MCP size varied from 198.61 to 4533.04ha (mean  $\pm$  SD:  $1587.87 \pm 1214.81$  ha).

80% cluster core foraging areas varied substantially less in size among colony members (Table 2), from 57.02 to 122.79ha (mean  $\pm$  SD:  $82.49 \pm 21.93$  ha), and were significantly smaller than the MCP through which bats travelled ( $t = 4.68$ ,  $p < 0.001$ ); despite excluding only 20% of fixes, core foraging areas amounted to only  $8.63\% \pm 6.76$  (mean  $\pm$  SD) of the MCP areas. The large majority of foraging effort was focussed within distinct core areas away from the home wood. However, some limited foraging was also recorded within the home wood for most individuals. Away from the home wood twelve of the tracked colony members utilised only a single core foraging area while two individuals (ID 198 and 942) each utilised two separate core areas (refer to Fig. 3b). Ordinance survey maps (1:25000) showing the locations of all core foraging areas recorded in this study are given in Appendices 3, 4 and 5.

### 3.4 Spatial organisation

There was considerable overlap between the MCP areas of all colony members (Fig. 2a (2007), 2b (2008), 4a (2007 & 2008)). No overlap of core foraging areas occurred outside of the home wood (outer cores) among bats tracked within the same year (Fig. 3a (2007), 3b (2008)) however overlap among two pairs of bats became apparent when data from both years of study were pooled (Fig. 4b (2007 & 2008)). The spatial footprints of these overlapping core foraging areas were markedly similar (Fig. 5a, 5b) and in both circumstances one of the individuals from the pair also utilised one other separate core area outside of the home wood (Fig. 3b). Core areas within the home wood (inner cores) displayed a high level of overlap (Fig. 3a (2007), 3b (2008), 4b (2007 and 2008)). Mean percentage overlap data for all *B. barbastellus* tracked in 2007, 2008, and 2007 and 2008 pooled is summarised in Table 3.

### 3.5 Site fidelity

The period of time within which tracking data were recorded for individual bats ranged from 2 to 9 days (mean: 4.9 days). During this period colony members expressed high site fidelity to their core foraging areas, utilising almost identical spatial footprints over repeated nights of tracking (e.g. Fig. 6 a, b, c). A single individual (210) that was tracked in both years of the study, during September and August respectively, also expressed high site fidelity across this period, generating highly similar core area spatial footprints across years (Fig. 6 d).



### 3.6 Habitat availability

The overall composition of available habitats (combined MCP) in study area A over 14804 ha was 37.81% improved grassland, 15.17% urban, 11.26% broad-leaved woodland, 11.07% arable, 9.22% upland moor, 3.60% riparian, 3.48% coniferous woodland, 2.90% scrub, 2.25% open water, 2.21% unimproved grassland and 1.03% mixed woodland.

### 3.7 Habitat preference

Mean percentages of each habitat type for 80% core foraging areas and the combined MCP are shown in Fig. 7. Percentage habitat composition of individual 80% core foraging areas (used) was significantly different from the combined MCP (available) (weighted mean Wilk's  $\lambda = 0.0057$ ,  $\chi^2 = 72.2776$ , d.f. = 10,  $p < 0.0001$ , randomisation  $p < 0.001$ ). A ranking matrix (Table 4) ordered the habitat types in sequence from most to least selected habitats as follows: riparian>>> broad-leaved woodland> unimproved grassland> improved grassland> scrub> mixed woodland> coniferous woodland>>> urban> upland moor> arable> open water (where a habitat preceding a '>' symbol was preferred to that immediately following the symbol and where a '>>>' symbol shows a significant selection). Table 4 shows that riparian was selected significantly above all other habitat types except unimproved grassland, and broad-leaved woodland was selected significantly more than all other habitat except riparian, unimproved grassland, improved grassland and mixed woodland. Urban, upland moor, arable and open water habitats were least preferred. Arable and open water were not significantly selected above any other habitat type and therefore were the habitats most avoided by *B. barbastellus*.

## 4. Discussion

### 4.1 Ranging behaviour

The large variability in foraging distances and individual MCP areas exhibited by *B. barbastellus* within this study is reflective of that recorded within other studies (Greenaway, 2001, 2008; Davidson-Watts and McKenzie, 2006). 80% cluster cores were relatively constant in size and formed less than ten percent of individual MCPs indicating that bats were selecting specific areas within which to forage, occasionally travelling substantial distances to do so. Ranging behaviour among non-reproductive females was consistent across sites A (Houndtor) and B (White) indicating that *B. barbastellus* from different colonies behave similarly (Table 2). At sites C (Hembury) and D (Dendles) bats were tracked earlier in the season, before the onset of pregnancy and the formation of maternity colonies. Both these individuals had relatively small home ranges, in particular bat 672 at site D which was tracked in May and early June and had the smallest recorded range. Seasonal change in foraging behaviour has previously been recorded in *B. barbastellus* (Davidson-Watts and McKenzie, 2006), as well as a number of other insectivorous bat species (e.g. Duvergé and Jones, 1994; Russ et al., 2003). Greenaway (2001) further suggested that *B. barbastellus* utilise woodland close to roosts more frequently when ambient temperatures are low; woodland can act as a natural temperature buffer during cold weather (Langvall and Ottosson Lofvenius, 2002), supporting a greater abundance of insect fauna, therefore becoming more attractive to foraging bats. Intra-specific competition is also likely to be reduced during May and early June. Maternity colonies are yet to form and the density of conspecifics within the home wood is relatively low allowing present bats to utilise foraging sites closer to roosts. It is possible therefore that the short forays and small home ranges recorded for bats at

site C and D can be explained by seasonal effects acting through factors such as temperature related habitat use or low intra-specific competition, or both. However, without a larger sample size, confirmation of these effects is beyond the scope of this study.

The mean maximum foraging range and individual MCP was higher among bats in this study compared to those found in other studies (Table 5). Comparably the samples of other studies included pregnant and lactating bats whereas this study did not. It is apparent that bats reduce foraging distances during pregnancy and lactation most likely due to increased energy demands and the requirement to return to roosts to feed young (e.g. Catto et al., 1996; McLean and Speakman, 1999). Moreover, post-lactating and non-breeding adult females may increase foraging ranges to reduce competition with volant juveniles in areas of high quality habitat close to the home wood (e.g. Clark et al, 1993; O'Donnell, 2001). Therefore, differences in mean data across studies of *B. barbastellus* may be indicative of the reproductive condition of bats within samples. Two of the fourteen colony members tracked at site A (Houndtor) utilised very large foraging ranges (Bat 190: 17.03 km, bat 260: 20.38 km) and disproportionately increased the size of the colony home range (combined MCP) by over 40%. Davidson- Watts and McKenzie (2006) noted similar long forays in non-reproductive *B. barbastellus* and suggested that this behaviour may be indicative of social activity rather than strict foraging effort as subjects also spent a considerable amount of time foraging near day roosts. In this study, foraging time within or proximal to the home wood was relatively low. Moreover the behaviour of bats travelling the greatest distances was not apparently different to any other. Therefore, although it is difficult to accurately assess the nature of behavioural activity using radio-telemetry techniques, it seems apparent that in this circumstance even those bats that travelled the greatest distances were doing so to forage. Therefore an explanation as to why a few individuals travel disproportionately large distances to core foraging areas may instead be more heavily dependent on factors such as colony demographics, spatial organisation of foraging areas and availability of productive foraging habitat.

#### 4.2 Spatial organisation and site fidelity

The low levels of core foraging area overlap recorded in this study, particularly among bats tracked within the same year, indicate that to a large extent *B. barbastellus* partition foraging resources among conspecifics into individual core areas. Moreover, this pattern of spatial organisation appears to be consistent across populations (Greenaway 2001, 2008; Davidson-Watts and McKenzie, 2006; Hillen et al., 2009). Minimal overlap of core foraging areas may be indicative of territoriality, with individuals defending their core foraging area against intruding conspecifics (Brown and Orians, 1970; Maher and Lott, 1995). Range overlap, or territoriality, can be significantly affected by resource abundance (e.g. Carpenter, 1987; Armstrong, 1991) and consequently may be more acute in predators with specialised diets, such as *B. barbastellus*. If, however, resources become particularly abundant, the cost of defending them against intruders becomes too high, reducing territoriality, which may explain occasional cases of significant overlap between pairs of individuals. Hillen et al., (2009) however suggested that patterns of spatial organisation were more strongly influenced by site fidelity than they were by competitive behaviour such as territoriality, although competition could not be ruled out as being responsible for the initial establishment of core areas with small overlap. Site fidelity is common among insectivorous bats (e.g. Racey and Swift, 1985; Rydell, 1989; Entwistle et al., 1996;

Kerth et al., 2001; Kapfer et al., 2008) and was clear among all *B. barbastellus* radiotracked in this study independent of foraging range, not only within a single season but also between years. Provided that the productivity of a foraging patch remains stable over time, site fidelity may be an advantageous strategy over 'randompatch' foraging in that tradition will avoid costs for repeated searching for profitable hunting grounds (Chaverri et al., 2007). Furthermore, if foraging areas remain stable for all colony members, site fidelity would allow individuals to utilise more or less 'private' foraging areas (Hillen et al., 2009), therefore avoiding territorial confrontation and the associated energy costs and risks.

The only apparent overlap of core areas recorded in this study occurred when data from two consecutive years were combined. Due to the temporal separation of data it is impossible to determine whether these overlaps actually represent real-time sharing of core foraging areas or whether competition for resources drove a shift in dominance over foraging 'rights' on these patches. Individuals may also have capitalised on unexploited foraging areas left vacant by non-returning bats or perhaps deaths among colony members. A comparison of spatial footprints between individuals that overlapped showed core areas were strikingly similar, perhaps more so than would be expected if two non related bats were involved. Currently it is unclear within most insectivorous bat species how juveniles establish foraging areas, however there is evidence to support the idea of maternal inheritance; Kerth et al. (2001) found that within a colony of *Myotis bechsteinii* genetic similarity significantly positively correlated with the degree of overlap among individual foraging areas, suggesting closely related individuals (mothers and daughters) share hunting grounds. It should be noted however that there is also evidence among other bat species that juveniles forage independently from their mothers (Audet, 1990; Jones et al., 1995). It is possible then that the overlapping core areas of the two pairs of bats recorded in this study represent adoption of maternal foraging sites by juvenile *B. barbastellus* and the subsequent sharing of these sites with their mothers, and perhaps even sisters.

It is clear then that the female *B. barbastellus* radiotracked in this study partition foraging resources and utilise hunting grounds largely independently from one another. Unfortunately the forces that drive this spatial organisation cannot be identified without further study, such as an assessment of the productivity of core foraging sites and an understanding of relatedness among colony members, although it is likely that site fidelity and territorial competition, driven by resource abundance, play important roles in shaping the observed behaviour.

#### 4.3 Habitat preference

*B. barbastellus* showed a clear and significant preference for foraging in riparian vegetation, followed by broad-leaved woodland and unimproved grassland. This is the first study to show the significant importance of riparian habitat for foraging *B. barbastellus*, although it has been previously suggested by others (Greenaway 2001, 2008; Davidson-Watts and McKenzie, 2006). Davidson-Watts and McKenzie (2006) found water to be the most strongly selected habitat among a colony of *B. barbastellus* in Hampshire, UK, although admitted that the importance of riparian habitat may have been under-estimated, and water over-estimated, due to the way in which habitats were categorised within habitat data. Conversely, in this study open water was the least selected habitat, further suggesting that the importance of water may have been overestimated by Davidson-Watts and McKenzie (2006). It should be noted that within this study a single large body of water, the Teignmouth estuary,

formed the major component of available open water. Therefore inclusion of the estuary within the open water category may have resulted in an under-estimation of the importance of smaller, fresh water-bodies such as streams and lakes. However, open water was one of the least available habitats and consequently compensating for the Teignmouth estuary is unlikely to significantly alter the importance of open water. In agreement with the conclusions made by Davidson and Mckenzie (2006) it seems apparent that riparian vegetation, rather than the water it surrounds, is more important to foraging *B. barbastellus*, although the secondary importance of water in supporting riparian vegetation should be noted.

Apart from open water, arable, upland moor and urban habitats were the next most avoided. The avoidance of arable land is in agreement with Davidson-Watts and Mckenzie (2006) and has been reported for numerous other insectivorous bat species (e.g. Waters et al., 1999; Duvergé and Jones, 1994; Davidson-Watts et al., 2006). The avoidance of urban environments also appears to be typical (e.g. Davidson-Watts et al., 2006). Heath and moorland are known to support a diversity of moths (Waring and Townsend, 2003) so it is perhaps surprising that upland moor is one of the habitats least selected by *B. barbastellus*. However, the upland moors of Dartmoor, despite supporting large areas of unimproved habitat, are highly exposed, elevated areas. Colder temperatures and stronger winds associated with more exposed environments are likely to reduce insect abundance and increase the energetic costs of flight, therefore making upland moor habitat less favourable to foraging bats. Habitat selection among bats is strongly associated with prey availability. Riparian vegetation supports high insect densities (Warren et al., 2002) and is important foraging habitat for many bat species (e.g. Walsh and Harris, 1996; Vaughan, et al., 1997; Russ and Montgomery, 2002). Similarly, insect densities are relatively high within both broad-leaved woodland and unimproved grassland habitats (e.g. Walsh and Harris, 1996; Sierro, 1999; Davidson-Watts and Mckenzie, 2006). Oak woodlands (*Quercus* spp.) in particular support high moth diversity (Kennedy and Southwood, 1984) which may account for its strong selection not only by *B. barbastellus* but also other moth specialists such as *Rhinolophus ferrumequinum* (Duvergé and Jones, 1994; Flanders, 2008). Conversely, the habitats shown to be least selected in this study tend to support lower moth diversity and abundance. This is particularly true of intensively farmed arable land where increased use of pesticides and a general shift towards habitat simplification has led to declines in many insect groups (Benton et al., 2002; Wickramasinghe et al., 2004). Furthermore, the specific targeting of lepidopterans as agricultural pests is likely to be accountable for the avoidance of arable land by *B. barbastellus* (Sierro, 1999; Davidson-Watts and Mckenzie, 2006).

In this study, improved grassland was the fourth most selected habitat, indicating its importance as a foraging resource for *B. barbastellus*. However, Davidson-Watts and Mckenzie (2006) suggested it to be of limited importance. Improved grassland is typically species poor, both in terms of flora and insect fauna, and consequently likely to be of little importance to insectivorous bats. In Dartmoor, the large majority of improved grassland fields are bordered by hedgerows and occasional woodland edge habitat. Furthermore, the hedgerows tend to be frequently unkempt, potentially speciesrich habitat and often contain mature broad-leaved trees. Fields of improved grassland are also typically smaller than those of arable use and consequently support higher densities of these types of boundary features. Recent evidence, based on the molecular identification of insect prey in faecal samples, suggests *B. barbastellus* specialise in the predation of tympanate macro-moths (Zeale et al.,

unpub.). Furthermore, the majority of moths identified within the diet are common species, often associated with Oak woodland, unimproved grassland, riparian vegetation, and hedgerows. It is therefore, quite likely that *B. barbastellus* is utilising hedgerows and other border vegetation surrounding fields of improved grassland rather than the grassland itself. Importantly this new information highlighting the dietary requirements of *B. barbastellus* strongly supports the overall findings of this study with regard to habitat selection by this species.

Scrub, mixed woodland, and coniferous woodland were largely used in proportion to their availability, suggesting that these habitats are of relatively little importance to foraging *B. barbastellus*, although feeding may occur opportunistically where these habitat types occur.

#### 4.4 Nocturnal activity

Bats show species-specific emergence behaviour with the time of emergence appearing to be a function of dietary specialization (Jones and Rydell, 1994). During emergence bats must balance the cost-benefit ratio of predation from hawking birds and the requirement to feed. This is particularly acute in species that feed predominantly on crepuscular insects, where resources become gradually scarcer over time after sunset. For moth specialists the opposite may be true, as the abundance of many moth groups remains relatively constant throughout the night. *B. barbastellus* emerged comparatively earlier than other moth specialist bats such as *Rhinolophus spp.* (Duvergé et al., 2000; Knight, 2006) and *Plecotus spp.* (Entwistle et al., 1996), presumably exposing themselves to greater predation risk. This seems counterintuitive given that the demand to forage soon after sunset should be low. It has however been shown that tree cover near roosts can result in earlier emergence times (Jones et al., 1995; Duvergé et al., 2000; Russo et al., 2007) and importantly bats in this study typically remained within the home wood for a further 28 minutes after emergence before commuting to individual foraging sites. Perhaps then, predation risks for *B. barbastellus* are more attuned to the emergence time from the home wood rather than the roost itself, with bats emerging from roosts relatively early, under canopy cover, to feed opportunistically within the home wood before commuting to individual foraging sites when light levels become more favourable. Time spent in the home wood after emergence may also serve to reinforce social bonds, given that colony members frequently roost apart from one another. Total flight time per night was relatively consistent among colony members and on every occasion bats returned to day roosts well before sunrise. The consistency of flight times is perhaps not surprising given that all bats were of non-reproductive condition.

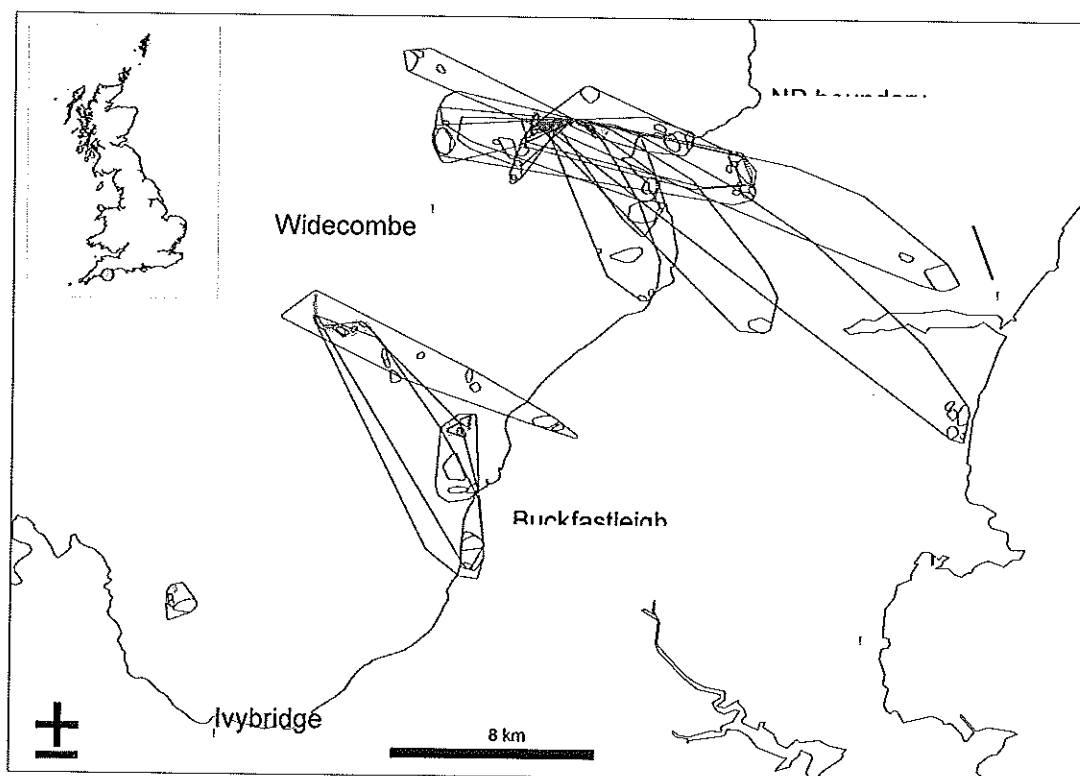
In other insectivorous bat species, flight times have been shown to be significantly extended during pregnancy and lactation (e.g. Dietz and Kalko, 2007) due to the associated increased energy demands. Without data from reproductive bats (pregnant or lactating) it remains unclear whether *B. barbastellus* also increases foraging times under these conditions. Return times suggest that the pressure on bats to forage for the full length of night was limited, perhaps indicating that prey resources within core foraging areas were relatively abundant; if the productivity of core areas was relatively low (or energy demands high, for example during pregnancy and lactation) bats would be expected to maximise returns from limited available resources by foraging until dawn light levels become unfavourable. Although all bats returned to day roosts well before sunrise the time of return was highly variable. Importantly, return time was not correlated with foraging range

suggesting that other factors, such as the productivity of foraging sites and/or individual foraging efficiency, may instead be responsible for the difference in return times found among colony members. Return commutes were typically more direct and faster than outward commutes, with slower flight perhaps suggesting that bats feed opportunistically on outward journeys. Predation risks are also likely to be lower during return commutes, when light levels are low, affording bats the opportunity to fly more openly and direct above vegetation. It was notable however that even on outward commutes *B. barbastellus* was unhindered by expanses of open land and were recorded flying over large open fields, areas of openmoor, busy dual-carriage roads (see also Kerth and Melber (2009)), and open estuary (500 metres across) to reach foraging sites.

Within foraging areas *B. barbastellus* foraged at speed and rarely slowed or perched, supporting suggestions that this species is predominantly an aerial-hawker (Rydell et al., 1996; Rydell and Bogdanowicz, 1997; Sierro and Arlettaz, 1997). Field observations revealed that foraging efforts were often focussed along hedgerows and woodland edge, although feeding also occurred within more cluttered woodland environments as well as above open fields.

Bats night roosted infrequently during the night, almost always within core foraging areas and usually for short periods, perhaps on occasions perching rather than roosting. The total time spent night roosting constituted only a small fraction of nightly activity. Night roosting may serve a multitude of purposes including thermoregulation, information exchange, digestion, or energy conservation when the availability of prey is low (Knight & Jones, in press). During the tracking period temperature and weather conditions were relatively stable suggesting thermoregulation might not have been an issue for the bats. The use of individual foraging areas and the spatial separation between these areas would suggest that night roosts are unlikely to be shared.

Consequently night roosting would serve little or no function for the purpose of information exchange between conspecifics. Bat species that feed heavily on insects that peak in abundance during crepuscular periods tend to match the timing and intensity of foraging efforts accordingly (Jones and Rydell, 1994), with bi- or multimodal patterns of night roosting reflecting periodical lows in prey availability. Feeding on moths, *B. barbastellus* most likely encounters a relatively stable availability of prey throughout the night, perhaps reducing the impetus on night roosting as a function of energy conservation. Furthermore, moths are largely soft-bodied and consequently should be comparatively easier to digest than insects with a proportionately high chitin component such as flies and Diptera. For *B. barbastellus* which feeds almost exclusively on moths, digestion may be more fluent and digestive efficiency is likely to be relatively high, reducing the need to rest between foraging bouts to aid digestion. Despite these suggestions it is currently unclear why *B. barbastellus* spend such little time night roosting.



**Fig. 8** Use of landscape by 19 *B. barbastellus* showing individual MCPs and 80% cluster core areas for all bats radiotracked during 2007 and 2008.



Planning, Transportation and Environment

Head of Development Management  
Dartmoor National Park Authority  
Parke  
Bovey Tracey  
Devon  
TQ13 9JQ

County Hall  
Topsham Road  
Exeter  
EX2 4QD

Tel: 01392 382880  
Email: [planning@devon.gov.uk](mailto:planning@devon.gov.uk)

Our Ref: SP/DCC/3242/2011

08 March 2012

Dear Sir,

**Town and Country Planning Environmental Impact Assessment Regulations 2011  
Regulation 22: Submission of additional Environmental Information  
Application DCC/3242/2011; Whitcleaves Quarry, Strode Road, Buckfastleigh**

**Construction and operation of Materials Recovery Facility for Inert Construction and demolition wastes; Construction and operation of Incinerator Bottom Ash Processing facility; removal of dolerite outcrop and filling quarry with dolerite and inert material to a depth of 60mAOD to facilitate storage of recycled materials with associated site engineering and infrastructure.**

I am writing to advise you that additional environmental information has been received in respect of this planning application which was accompanied by an environmental statement.

The additional environmental information comprises:

1. Junction analysis: A38 sliproads
2. Supplementary note on traffic: February 2012
3. Habitats Monitoring and Mitigation main report (Nature Conservation)
  - Appendix 1 Ecological Mitigation
  - Appendix 2 Potters Wood extension
  - Appendix 3 Hedgebank planting plan
  - Appendix 4 Hedgebank cross section
  - Appendix 5 Perimeter swale and bund planting plan
  - Appendix 6 Perimeter swale and bund cross section
  - Appendix 7 Lighting Plan
  - Appendix 8 Greater Horseshoe Bat commuting habitat areas
4. Blasting trials Report
  - Blasting trials Report Appendix 1
5. Bat hibernation caves monitoring report
6. Amended information from applicant comprising:
  - Revised Non technical summary
  - Revised Figure 6.4 (Phase 2) Rev C

Textphone 0845 1551020 SMS Text 0777 3333 231  
[www.devon.gov.uk](http://www.devon.gov.uk)

Strategic Director Place: Heather Barnes



- Revised Figure 6.4.1 (Phase 2 + extraction area) Rev C
- Revised Fig 6.5 (Phase 3) Rev C
- Fig 10.7 Site drainage

Other additional information is also available:

- Health Impact Assessment
- Noise assessment for road traffic (carried out by DCC)

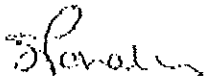
I enclose a CD copy of the additional information. This information can also be viewed online at the following address: <http://www.devon.gov.uk/appref?id=3919> and click on 'Additional Information received March 2012 (re-consultation)'

If you wish to make any further representations in respect of this additional information then you should do so in writing within 21 days of the date of this letter to:

Devon County Council, Development Management, Lucombe House, County Hall, Exeter, EX2 4QD or by e-mail to [planning@devon.gov.uk](mailto:planning@devon.gov.uk).

It is currently anticipated that this application will be considered by the County Council's Development Management Committee on 25th April 2012 although this information will be kept up to date on the County Council's web page.

Yours sincerely



Sue Penaluna  
Planning, Transportation and Environment

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**From:** Cate Jackson  
**Sent:** 04 April 2012 17:06  
**To:** 'sarah.jennings@devon.gov.uk'  
**Cc:** Daniel Janota; 'sue.penaluna@devon.gov.uk'  
**Subject:** DNPA whitecleaves comments

Hi Sarah

How are things? Tried calling you today in the hope I'd catch you to have a chat about Whitecleaves and where we are with HRA?

As you'll know, DNPA have been consulted on URS's ecological mitigation & monitoring plan 21 Feb 2012, along with their bat hib counts and blasting trial report. So I've been wading through that to see if they've addressed all our initial concerns.. what you, Kestrel and NE must be doing! Also, I'm aware that in NE's ltr dated 13.09.11, Julien had requested an HRA for salmon. Wondering where we are with that. Also, given this is due to water quality concerns should we be concerned about poss effects on Otter?

Before I submit my comments to Sue Penaluna, I'm really keen to have a chat with you and to make sure we're all in agreement. Aware that I need to send my comments to Sue P asap as it's going to DCC committee 25<sup>th</sup> april. Trouble is, I'm only in the office until 530 today, then back in on Tues (only work mon-weds). So hopefully chat to you next Tues if you're not back in the office this afternoon.

Take care and chat soon,  
Cate

Cate Jackson  
Ecologist  
Dartmoor National Park Authority  
01626 831091



**Dartmoor National Park Authority**  
Parke, Bovey Tracey, Newton Abbot, Devon, TQ13 9JQ  
Tel: (01626) 832093  
Fax: (01626) 834684  
E-mail: [hq@dartmoor-npa.gov.uk](mailto:hq@dartmoor-npa.gov.uk)  
Web site: [www.dartmoor-npa.gov.uk](http://www.dartmoor-npa.gov.uk)



Mrs S Penaluna  
Devon County Council  
Lucombe Hall  
County Hall  
Topsham Road  
Exeter EX2 4QW

Your ref: SP/DCC/3242/2011

11 April 2012

Dear Sue

**Updated ecological comments on Application DCC/3242/2011;  
Construction of materials reclamation facility, Incinerator Bottom Ash  
recycling facility and removal of dolerite outcrop, Whitecleaves Quarry,  
Strode Road, Buckfastleigh**

Thank you for your letter dated 8 March 2012, consulting DNPA on the additional environmental information received to support the environmental statement in respect of the above planning application.

The additional environmental information, particularly the ecological mitigation and monitoring plan 21 February 2012 and the bat hibernation caves monitoring report, addressed the concerns raised by the DNPA Ecologist in DNPA's letter dated 7 October 2011.

**South Hams Special Area Of Conservation (SH SAC)**

The mitigation measures, monitoring and biodiversity enhancements proposed for greater horseshoe bats in the additional information provided are satisfactory overall. As such, subject to the Appropriate Assessment that is currently being completed by DCC and checked by Natural England, concluding that the development will not impact upon the integrity of the SH SAC, the DNPA Ecologist withdraws the objection to the proposed works.

Whilst it is considered unlikely that bat activity could be significantly reduced if all mitigation measures are applied, should post-development monitoring show that bat activity is adversely affected, an action plan approved by DCC Ecologist should be in place.

**Barbastelle Bats**

DNPA's initial concerns regarding the lack of consideration of potential impacts of the proposed works on barbastelle bats have been addressed by further work carried out by URS Scott Wilson. The findings detailed in URS Scott Wilson's letter dated 10 January 2012, conclude that the proposed

works are unlikely to have a significant effect on the conservation status of this species in the National Park.

Water quality in the Dean Burn

The environmental statement produced in June 2011 identified that the proposal may impact upon water quality in the Dean Burn, a tributary of the River Dart. The DNPA Ecologist's concerns will be satisfied subject to DCC's Appropriate Assessment concluding that there are no significant impacts upon Atlantic Salmon. It is hoped that DCC will consult with the Environment Agency further on this matter, the respected authority on aquatic issues.

Finally, I would like to re-iterate the comments made by this Authority's Planning Officer, Dan Janota, in his letter dated 7 October 2011: If DCC approve the application, this Authority would seek robust conditions and/or legal agreements to secure the successful implementation and long term control of the operation.

Please do not hesitate to contact me if you require any further comments.

Yours sincerely

A handwritten signature in black ink, appearing to read 'C Jackson', with a stylized flourish at the end.

Cate Jackson  
**Ecologist**  
Dartmoor National Park Authority

---

**From:** Sue Penaluna [sue.penaluna@devon.gov.uk]  
**Sent:** 17 April 2012 10:55  
**To:** Cate Jackson  
**Cc:** Sarah Jennings  
**Subject:** RE: 3242/2011 Whitecleave Quarry - DNPA Ecology consultation comments 11042012  
**Attachments:** 13 April final HRA Whiecleaves agreed with NE.doc

Morning Cate, I have attached the concluded HRA for Whitecleaves. If you have any questions about it could you please contact Sarah, but we have involved Julien Sclater all the way through and taken on board his comments - he says he has none further to make.

Regards  
Sue Penaluna

-----Original Message-----

**From:** Cate Jackson [mailto:cjackson@dartmoor.gov.uk]  
**Sent:** 17 April 2012 09:36  
**To:** Sue Penaluna; Sarah Jennings  
**Subject:** FW: 3242/2011 Whitecleave Quarry - DNPA Ecology consultation comments 11042012

Hi Sue & Sarah  
Just wanted to check that you received my updated ecological comments I emailed to you both last wk?

As Dan Janota's away on leave, please keep me in the loop and if there's a copy of the HRAs available I'd be interested to see them. Does it go to committee on 25th April?

Many thanks  
Cate

Cate Jackson  
Ecologist  
Dartmoor National Park Authority  
01626 831091  
Mon - Weds

-----Original Message-----

**From:** Cate Jackson  
**Sent:** 11 April 2012 16:26  
**To:** 'sue.penaluna@devon.gov.uk'  
**Cc:** 'Sarah Jennings'  
**Subject:** 3242/2011 Whitecleave Quarry - DNPA Ecology consultation comments 11042012

Dear Sue

Please find attached updated ecological comments from DNPA Ecologist Re. Ap1 3242/2011 Whitecleave Quarry.

As you may be aware, Dan Janota from our Forward Planning Department is now on paternity leave for a few weeks, so if you have any queries regarding ecological issues do contact me on 01626 831091. Please note that I only work Mon-Weds so if it is urgent please contact my colleague Norman Baldock on 01626 832093 as he may be able to help you.

For any other non-ecological issues, please contact Stephen Belli, Head of Planning, on 01626 832093 as he is covering this case in Dan's absence.

Many thanks  
Cate Jackson

Ecologist  
Dartmoor National Park Authority  
01626 831091

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# Habitats Regulations 2010

## Section 1: Screening of likely significant effect on a European site

Devon County Council

### 1.Type of permission/activity:

Full Planning Permission

### 2. Application reference no:

SP/DCC/3242/2011  
Whitecleave Quarry, Buckfastleigh, Devon

### 3. National grid reference:

SX 7377 6552

### 4. Brief description of proposal:

The application consists of three separate elements, (a) construction of a Materials Recovery Facility (MRF) for Construction and Demolition Wastes, (b) removal of dolerite spur (300 000 tonnes), (c) construction of an Incinerator Bottom Ash (IBA) Processing Facility on land released by removal of the spur.

- **Area** – 3.7ha.
- **Current land use** – extant quarry and associated buildings surrounded by broadleaved woodland and scrub that extends into Potters Wood SSSI to the south. The quarry face includes several crevices and supports scrub and scattered small trees.
- **Associated infrastructure** – existing road and office buildings to be upgraded , new processing and storage facilities for inert waste and incinerator bottom ash, associated drainage and lighting.
- **Phases** –
  - Phase 1 – construction of the MRF facility
  - Phase 2 – construction of the IBA facility. This will include blasting of 300,000 tones of dolerite from the quarry to form a working platform and using the quarry void as storage for the mineral.
  - Phase 3 – Backfilling of the quarry void will be completed using the excavated dolerite. When market demand increases this mineral will be replaced with inert material from the MRF plant. The quarry void will be filled to ensure the level is maintained at 60 m AOD (level with the ground levels at the IBA facility).
- **Working methods** – facility will normally operate from 07.30 to 18.30 hrs Mon- Fri, and from 08.00 to 13.00 hrs on Saturday. Access for emergency works will be required outside of these hours.

Relevant information is summarised in “*Construction and operation of recycling facilities at Whitecleave Quarry, Buckfastleigh, Devon Planning Application Supporting Statement*, July 2011, produced by URS Scott Wilson.

<p><b>5. European site name(s) and relevant interest features:</b></p>	<p>Name: <b>South Hams SAC.</b></p> <p><b>Relevant interest feature: Greater horseshoe bats</b> (<i>Rhinolophus ferrumequinum</i>) are an Annex II species which are a primary reason for the selection of the site as an SAC.</p> <p>- South Hams in south-west England is thought to hold the largest population of greater horseshoe bat <i>Rhinolophus ferrumequinum</i> in the UK, and is the only one containing more than 1,000 adult bats (31% of the UK species population). It contains the largest known maternity roost in the UK and possibly in Europe. As the site contains both maternity and hibernation sites it demonstrates good conservation of the features required for survival.</p> <p>The quarry is within Natural England's Greater Horseshoe Bat consultation zone for the SAC, lying within the sustenance zone for Buckfastleigh Caves and a strategic flyway. The quarry is 700m from Buckfastleigh Caves SSSI (a Greater Horseshoe Bat maternity roost) and 2.5km from Bulkamore Iron Mine SSSI (also a GHB hibernation roost). Both form part of the South Hams SAC.</p> <p>Name: <b>Dartmoor SAC</b></p> <p><b>Relevant interest feature: Atlantic salmon</b> <i>Salmo salmar</i></p> <p>The Dean Burn flows into the River Dart which is a migratory route for salmon, an interest feature of the Dartmoor SAC.</p> <p>Please note that it has been agreed with NE that there are no other qualifying features of these SACs and no other SACs / SPAs that need to be considered within this HRA screening.</p>
<p><b>6. Is the proposal directly connected with or necessary to site management for nature conservation?</b></p>	<p>No</p>

## 7. Greater Horseshoe bat survey results

A series of bat surveys of the site were undertaken in 2008, 2009 and 2010 by Devon Wildlife Consultants and in 2011 by URS Scott Wilson. These have shown that there is an important commuting route for Greater horseshoe bats along the north western section of the site. This flight line runs along a wooded spur between the existing office complex and the main quarry void, crosses the entrance road to the quarry and follows another wooded hillside along the western edge of the site. In August 2010 a peak count of 143 greater horseshoe bats was recorded commuting along this route. It is likely that these bats are from Rock Farm (part of the Buckfastleigh Caves SSSI), the largest known Greater Horseshoe Bat breeding roost in the UK. Greater horseshoes were only occasionally recorded foraging on the site. No bats were roosting in caves within the quarry face. (See - *Greater Horseshoe bat monitoring surveys*, URS, 2011).

In February 2012 three surveys were carried out of three caves within Potters Wood SSSI (Potters Wood cave, Bunkers Hole and Shakey Hole). Four Greater Horseshoes were recorded on 10<sup>th</sup> February, two on the 15<sup>th</sup> and two on the 20<sup>th</sup>. This supports historical records that only very low numbers of hibernating bats are found in the Potters Wood caves (*Bat Hibernation Caves Monitoring*, URS, 2012).

Sufficient bat survey information has been provided to carry out the HRA for this application (confirmed by NE in a letter from NE to DCC, dated 13<sup>th</sup> September 2011).



## Screening Assessment for likely significant effect

### 8. Potential hazards likely to affect the interest features

Sensitive interest feature	Possible impacts	Likely impact if known
South Hams SAC: Greater Horseshoe bat sustenance zone (foraging habitat)	<ul style="list-style-type: none"> <li>Change / degradation of foraging habitat</li> <li>Physical loss of foraging habitat</li> <li>Disturbance to foraging habitat e.g. increased lighting</li> </ul>	Removal of the dolerite outcrop will result in the loss of approx. 0.35ha of broadleaved woodland. Surveys ( <i>Greater Horseshoe bat monitoring surveys</i> , URS, 2011) have shown single or low numbers of Greater Horseshoes foraging across the site. The impact of the loss of the woodland is therefore considered negligible in terms of the SAC sustenance zone and will not have a likely significant effect on the SAC, alone or 'in-combination' with other plans and projects.
South Hams SAC: Greater horseshoe bat strategic flyway	<ul style="list-style-type: none"> <li>Loss/severance of linear features e.g. trees, hedges, fence lines</li> <li>Links between existing landscape features</li> <li>Disturbance e.g. increased lighting &gt;0.5 Lux</li> <li>Inappropriate management of linear features</li> <li>Creation of physical barriers e.g. security fencing</li> </ul>	<p>An important commuting route has been identified through the western side of the site (<i>Greater Horseshoe bat monitoring surveys</i>, URS, 2011). The peak count of 143 bats in 2011 represents just over 8% of the total population of Greater horseshoe bats breeding at Rock Farm (within Buckfastleigh Caves SSSI)</p> <p>Potential threats to the viability of the flight line are from lighting, loss of tree and scrub cover long the route, physical obstructions and increased disturbance. Impacts on the flight line would present a threat to the SAC population by limiting / blocking access to foraging grounds and other major roosts in the wider landscape. It cannot therefore be ascertained (without agreed mitigation) that the proposal will not have a likely significant effect on the SAC alone.</p>
South Hams SAC: Hibernating Greater Horseshoe bats.	<ul style="list-style-type: none"> <li>Disturbance from blasting</li> </ul>	<p>Hibernating bats could be at risk of disturbance / mortality from blasting due to:</p> <ul style="list-style-type: none"> <li>repeated awakening from torpor which uses up their fat reserves leading to poor survival</li> <li>potentially from death due to barotrauma from changes in air pressure.</li> </ul> <p>The risk of disturbance to the large hibernation site at Buckfastleigh Caves, 700m away, and Bulkamore Iron Mine (2.5kms away), is considered negligible.</p> <p>Potters Wood caves have not been included in the SAC due to low numbers of Greater Horseshoes using this site. Whilst numbers of Greater Horseshoes in Buckfastleigh caves has increased since designation of the SAC, the 2011 survey has shown that numbers in Potters Wood caves remain low and therefore insignificant in terms of the SAC. This was confirmed by an email from Natural England in February 2012, 'we do not consider that these numbers are significant in terms of the South Hams SAC Greater Horseshoe interest'. Blasting will not therefore have a likely significant effect on the SAC alone, or 'in-combination'.</p>

Dartmoor SAC: Atlantic salmon	Impacts due to changes in water quality creating a barrier to salmon migration up the Dart to Dartmoor SAC.	<p>The Dean Burn watercourse flows in a predominantly north-easterly direction, passing the sites western and northern boundaries. Approximately 800m downstream of the site the Dean Burn converges with the River Mardle which then joins the River Dart east of Buckfastleigh. The River Dart flows from Dartmoor SAC. Water is currently discharged from the site into the Dean Burn in accordance with an Environment Agency discharge consent held by Sam Gilpin Demolition Ltd.</p> <p>The Environment Statement (ES) prepared for this application states that the risk to surface water from potential contamination sources, during construction, operation and decommissioning phases, is '<i>potentially significant i.e. moderate to high given the close vicinity of the Dean Burn</i>'. (Chapter 9, para 9.5.8). However the ES concludes (para 9.10.1) that due to mitigation and control measures which will be employed during each phase of the development, the level of risk is considered to be minimal and there will be no likely significant effect on Dartmoor SAC, alone or 'in-combination'..</p> <p>These measures will be secured through any planning permission conditioning:</p> <p>Development and implementation of a Construction Environmental Management Plan.</p> <p>Development and implementation of a Surface Water Management Scheme (including emergency response plans).</p> <p>In addition a bespoke Environmental Permit (EP) will be required from the Environment Agency (EA). This will ensure that all necessary site containment procedures and off-site discharges are controlled appropriately.</p>
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## Conclusion

### 9. Conclusion:

**Is the proposal likely to have a significant effect 'alone' or 'in combination' on a European site?**

#### **South Hams SAC**

**Impacts on foraging habitat:** This proposal will result in the negligible loss of foraging habitat and this loss will not have a likely significant effect on the South Hams SAC.

**Disturbance to Greater Horseshoes in Potters Wood caves:** The number of greater horseshoe hibernating in Potters Woods caves is not considered to be significant in terms of the SAC population and therefore any disturbance caused by blasting will not have a significant effect on the SAC. [Note that any disturbance to bats in these caves remains an offence under the Habitats Regulations. Please see the Landscape and Ecology Management Plan for more information on this issue].

**Impacts on flight lines:** The western edge of the site has been identified as a significant commuting route for Greater Horseshoes. Impacts on this flight line may limit / block critical access to the wider landscape and are likely to have a significant effect, alone, on the South Hams SAC. An appropriate assessment of the implications of the proposal for the site must therefore be carried out.

#### **Dartmoor SAC**

Screening has demonstrated that it can be concluded that this proposal will not have a likely significant effect on Dartmoor SAC.

## Section 2: Appropriate Assessment

### 1. Name /reference number and summary of the proposal:

Whitecleave Quarry, Buckfastleigh, Devon

Planning Reference No. SP/DCC/3242/2011

Construction and operation of a Materials Recovery Facility for inert construction and demolition wastes including:

- Construction and operation of an Incinerator Bottom ash processing facility;
- Removal of dolerite outcrop
- Filling quarry void with dolerite and inert material to a depth of 60m AOD to facilitate storage of recycled materials
- Associated site engineering and infrastructure

### 2. Name of European site and summary of the interest features that may be affected.

- South Hams SAC: specifically Buckfastleigh Caves SSSI and Bulkamore Iron Mine SSSI

#### Annex II species that may be affected:

Greater horseshoe bat *Rhinolophus ferrumequinum*

South Hams in south-west England is thought to hold the largest population of greater horseshoe bat *Rhinolophus ferrumequinum* in the UK, and is the only one containing more than 1,000 adult bats (31% of the UK species population). It contains the largest known maternity roost in the UK and possibly in Europe. As the site contains both maternity and hibernation sites it demonstrates good conservation of the features required for survival.

**Note: It has been agreed with NE that other interest features for this site will not be affected.**

### 3. Proposed Mitigation Measures

Implementation of the mitigation measures outlined below would be a condition of any planning consent. The measures are set out in "*Whitecleave Quarry Landscape and Ecological Management Plan*" (LEMP) produced by URS consultants in 2012. Implementation of the LEMP will be a condition of any planning consent. A copy of the LEMP is attached to this HRA. Appendices are too large to append and can be found at [http://www.devon.gov.uk/planpage\\_5\\_3919](http://www.devon.gov.uk/planpage_5_3919).

A clerk of works will be employed to oversee mitigation (as stated in the LEMP).

Identified Impact	Mitigation (as set out in the LEMP)	Secured via:
1. Potential loss of / disturbance to identified flight line along north western part of site	<p>All vegetation along the existing flight line will be retained.</p> <p>Designated vehicle parking zones have been allocated in order to avoid any physical obstructions to the flight line.</p> <p>In addition to the mitigation set out above the following enhancement measures will be undertaken which will strengthen the flight line and therefore benefit the SAC in the long term.</p> <ul style="list-style-type: none"><li>Planting in three areas at the entrance to the quarry. Details set out in Section 3.4.3 and Appendix 8 of the LEMP.</li><li>Bare earth banks on either side of the road to be planted with shrubs behind a retaining wall to provide additional cover for bats commuting along the flyway.</li><li>Additional bank and planting to form a new hedgebank and potential new bat flight path along the western edge of the development site. See Section 3.1.2 and Appendix 3 and 4 of the LEMP.</li></ul>	Condition
2. Threat of lighting disturbance to flight line	<ul style="list-style-type: none"><li>Light spill along the corridor to be at a maximum of 0.56 lux in order to ensure no lighting disturbance to the flight line. Details are set out in Section 3.4 and Appendix 7 of the LEMP.</li><li>Site only operational between 07.30 to 18.30 hrs Mon-Fri, and from 08.00 to 13.00 hrs on Saturday except in emergencies. No security lighting on site.</li></ul>	

4. Is the potential scale or magnitude of any residual effect likely to be significant?  
(Taking the above mitigation measures into account)

**5.1 Alone?**

**No** Given that mitigation will be secured through a condition it is considered that there will be no residual impacts from this proposal.

**5.2 In combination with other plans or projects?**

**No** There are no other plans or projects which could lead to an 'in-combination' light spill onto the flight line exceeding 0.56 lux. None of the plans or projects will have any other impact on the flight line through the western side of the site.

## 6. Appropriate Assessment : Conclusion

Mitigation, as outlined in Section 3 above, will ensure that there are no impacts on the Greater Horseshoe flight line. This mitigation will be secured through conditions attached to any planning consent. We can therefore conclude that this proposal will not have an adverse effect on the integrity of the South Hams SAC.

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**From:** Cate Jackson  
**Sent:** 18 April 2012 13:04  
**To:** 'sue.penaluna@devon.gov.uk'; 'Sarah Jennings'  
**Subject:** FW: Whitecleave Quarry proposal  
**Attachments:** Whitecleave Quarry bat mitigation JDA.pdf

**Importance:** High

Hi Sue and Sarah

DNPA have just been emailed this document written by John Altringham, well-respected Bat Ecologist, summarising that "there is considerable scientific doubt over the success of the mitigation plans and in my view the plan should not be authorised."

Have you received this document too? As you can see below, it was submitted by Neil Smith of Buckfastleigh Community Forum today.

Please can you confirm to me whether you have seen this document previously and whether this affects your views. I'm reading it now and trying to establish whether he's actually seen the Feb 2012 Monitoring and Mitigation Plan report. Would appreciate your comments on this as soon as possible as I need to advise our Head of Planning this afternoon. I'm in the rest of the day but not working again until Monday.

Many thanks  
Cate Jackson

Ecologist  
Dartmoor National Park Authority  
01626 831091

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**From:** Neil Smith  
**Sent:** 18 April 2012 12:50  
**To:** Stephen Belli  
**Cc:** Cate Jackson; Stuart Barker-ext; Philip Vogel; John Nutley; 'Buckfastleigh Town Council'; mel.stride.mp@parliament.uk  
**Subject:** RE: Whitecleave Quarry proposal  
**Importance:** High

Dear Stephen,

I am afraid I was not aware of this change of position because Devon County Council have not made public the representation by statutory consultees as should be expected in this instance. This is an unfortunate oversight on their part in terms of the due process of processing this application.

Please can you and the county ecologist review the attached document with some haste as it is clear there remains reasonable scientific doubt as to the ability to mitigate the impact on the South Hams SAC.

This document has been prepared by one of the country's leading bat ecologists, and demonstrate a lack of scientific certainty as to the ability of the SAC to not have its ecological functionality.

I am sorry this document has not been available before, but as I am sure you understand, it is a complex site and requires a formidable amount of work for a community group to co-ordinate.

This document would suggest that any decision to allow the development to proceed will be subjected to legal review as a potential breach of the principle established in the Waddenzee Judgement. You may wish to convene a special meeting of the planning committee to review this evidence and adjust the NPA's stance.

Your urgent attention to this matter would be most appreciated, and please can you ensure this communication is kept on record for the purposes of any potential enquiry into this matter.

Please can you keep me closely informed of any progress in this matter.

Thanks and regards  
Neil

Neil Smith  
co-Chair, Buckfastleigh Community Forum

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**From:** Stephen Belli [<mailto:sbelli@dartmoor.gov.uk>]  
**Sent:** 18 April 2012 12:10  
**To:** Neil Smith  
**Subject:** Whitecleave Quarry proposal

Dear Mr Smith

Please find attached a copy of my recent letter to Devon County Council regarding the above development.

I have already received a call querying our change of position from a local resident so I wanted to make you aware of the actual position of the National Park Authority.

At its earlier meeting the Authority resolved to object on one ground only - that is the potential impact on nature conservation and protected species. We have now received the additional evidence and assurances we needed from the County Council and the applicants and in this respect there are no longer any grounds for objection. The additional information has been carefully checked by our ecologist in consultation with the County Council and Natural England before we responded.

The other issues the Authority alluded to in its report are still there for the County Council to satisfy itself as planning authority. We raised those issues such as highway impact, potential impact on local amenities and tourism but the National Park Authority did not resolve to object on those grounds.

I trust this helps to clarify our position in this matter.

*Stephen Belli*  
Director of Planning  
Dartmoor National Park Authority  
Direct Line 01626 831017  
Fax number 01626 834684

View planning applications online at [http://www.dartmoor.gov.uk/application\\_register.htm](http://www.dartmoor.gov.uk/application_register.htm)  
Submit planning applications online at <http://www.planningportal.gov.uk>

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# Whitecleaves Quarry: assessment of mitigation plans to protect greater horseshoe bats

John Altringham

*Professor of Animal Ecology and Conservation, University of Leeds*

*April 2012*

## **1. Background: principal legislation protecting bats and in particular greater horseshoe bats**

**1.1 Why are greater horseshoe bats so well protected?** The UK population of this species has declined to approximately 5,000 individuals (most of them in Devon), estimated to be only 10% of those present 100 years ago. The species has undergone similar declines across its European range, due to habitat loss and fragmentation, changes in agricultural practice (including pesticide use) and roost loss (Aulagnier et al. 2008). It is even rarer in many countries, making the UK an important refuge for the species. Its range is now restricted to the extreme SW of England and S Wales. The South Hams SAC population is thus a remnant of a once much larger population, squeezed into one of the few parts of the country still able to support them. It is therefore imperative that their habitat is not degraded further. Their presence in this disturbed environment does not imply that they are thriving and would therefore survive further disturbance.

**1.2** The Wildlife and Countryside Act 1981 (WCA 1981) is the principal legislation for the protection of all bats and their habitats. Under Schedule 5 it is an offence to intentionally kill, injure or take bats, or to damage, destroy or obstruct access to any structure or place used by bats for shelter or protection.

**1.3** Under The Countryside and Rights of Way Act 2000 (CROW 2000) further protection was provided to species protected under the WCA, so that it is an offence to intentionally or recklessly disturb them, or to damage or destroy their habitat.

**1.4** The Conservation (Natural Habitats, &c.) Regulations 1994-2010: *The Habitats Regulations*. European protected species (EPS) listed in Schedule 2 of the Habitats Directive include all bat species. A licence must be obtained from Natural England in order to, amongst other things, disturb, capture or kill EPS, or to damage or deliberately destroy a breeding site or resting place of such a protected animal. A licence can only be granted where there are imperative reasons of overriding public interest, if there is no satisfactory alternative, and where the action taken would not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range. An offence would be committed where deliberate disturbance is likely to significantly affect the ability of a significant population of a species to survive, breed, or rear or nurture their young or significantly affect the local distribution or abundance of that species.

**1.5** Special Areas of Conservation (SAC) are designated under the EC Habitats Directive. Two are designated in Devon: South Hams and Beer Quarry & Caves. The ecological needs of the site/species must be met through appropriate conservation measures, to avoid habitat deterioration and disturbance that might threaten the protected species. Under *The Habitats Regulations*, if a proposed scheme is considered likely to have a significant impact upon a SAC, an Appropriate Assessment is required to determine whether the scheme will have an adverse impact on the integrity of this European site.



1.6 Under *The Habitats Regulations* there is a requirement to conserve linear features in the wider countryside, e.g. treelines and hedgerows, which are key features in the ecology of greater horseshoe bat.

1.7 *The Habitats Regulations* also state that: 'A person commits an offence if he .... deliberately disturbs animals of any such species (Annex IV of the Habitats Directive 92/43/EEC, which includes all UK bat species) in such a way as to be likely significantly to affect (i) the ability of any significant group of animals of that species to survive, breed, or rear or nurture their young, or (ii) the local distribution or abundance of that species'. It is accepted that the commuting routes of greater horseshoe bats could be disturbed by the scheme. Without effective mitigation the effects would be sufficient to recommend refusal of the scheme (WCC 2007b).

1.8 The Habitats Committee (established by the Environment Directorate-General of the European Commission (EDGECE)) advise that Article 12.1(d) of the Habitats Directive should be understood as 'aiming to safeguard the **ecological functionality** of breeding sites and resting places' (EDGECE 2007), that is, giving protection to foraging and commuting routes, since these are critical to the functionality of habitat.

1.9 Natural England issue licences under *The Habitats Regulations* to permit activities that are otherwise unlawful with respect to Annex IV species protected under the same legislation. Natural England's European Protected Species Guidance Note (2007) states that: "a licence is needed if .... the proposed activity is reasonably likely to result in an offence ..... If an activity is likely to result in disturbance or killing of a European protected species, damage to its habitat or any of the above activities [those listed in R.39], then a licence will usually be required." Thus, where development causes disturbance to bats while foraging or commuting, a licence is required.

1.10 Paragraph 14 of the recently published *National Planning Policy Framework* (2012) states (my underlining):

At the heart of the National Planning Policy Framework is a **presumption in favour of sustainable development**, which should be seen as a golden thread running through both plan-making and decision-taking.

For plan-making this means that:

- local planning authorities should positively seek opportunities to meet the development needs of their area;
- Local Plans should meet objectively assessed needs, with sufficient flexibility to adapt to rapid change, unless:
  - any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole; or
  - specific policies in this Framework indicate development should be restricted.<sup>9</sup>

Note 9 states: For example, those policies relating to sites protected under the Birds and Habitats Directives (see paragraph 119) and/or designated as Sites of Special Scientific Interest; land designated as Green Belt, Local Green Space, an Area of Outstanding Natural Beauty, Heritage Coast or within a National Park (or the Broads Authority); designated heritage assets; and locations at risk of flooding or coastal erosion.

Paragraph 119: The presumption in favour of sustainable development (paragraph 14) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined.

## 2. South Hams SAC

2.1 A key document in the case is the “**South Hams SAC – Greater horseshoe bat consultation zone planning guidance**” (Sclater 2010). I have compiled some very brief extracts from the guidance document that (i) describe the site, (ii) highlight the importance of commuting routes/flyways (the two terms are interchangeable) to horseshoe bats, (iii) summarise the objectives of the planning guidance with respect to such flyways, (iv) summarise the legal guidance following an Appropriate Assessment. I have emboldened some key phrases

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### EXTRACTS

#### 2.1.1 Site description

The South Hams SAC (Special Area of Conservation) was established under *The Conservation of Habitats and Species Regulations 2010 (the “Habitats Regulations”)* and is unusual for a SAC, in that it is comprised of several separate but linked component SSSIs with significant greater horseshoe bat maternity roost importance located over five local planning authority areas in South Devon:-

- *Berry Head to Sharkham Point* (Torbay Council)
- *Buckfastleigh Caves* (Dartmoor National Park Authority, South Hams District Council, Teignbridge District Council)
- *Chudleigh Caves and Woods* (Teignbridge District Council)
- *Bulkamore Iron Mine* (South Hams District Council)
- *Haytor and Smallacombe Iron Mines* (Dartmoor National Park Authority)

#### 2.1.2 On the importance of undisturbed commuting routes

- Greater horseshoe bats use the wider countryside of South Devon for the majority of their activities, including **commuting**, foraging, roosting, and mating.
- Greater horseshoe bats regularly travel through South Devon between feeding sites and their roosts via a network of **established flyways**.
- Greater horseshoe bats need to be able to move through the landscape between their roosts and their foraging areas to maintain favourable conservation status. **They require linear features in the landscape** to provide landscape permeability.
- The greater horseshoe bat will tend to **fly close to the ground** up to a height of 2 meters, and mostly beneath vegetation cover. Radio tracking studies and observations in the field confirm that greater horseshoe bats will **regularly use the interconnected flyways associated with lines of vegetation**. Further studies have shown that landscapes with broadleaved woodland and watercourses are important as they provide habitat continuity.
- Greater horseshoe bats are **sensitive to light** and will avoid lit areas. The interruption of a flyway, by light disturbance as with physical removal/ obstruction would force the greater horseshoe bat to find an alternative route which is likely to incur an additional energetic burden and will therefore be a threat to the viability of the bat colony.

#### 2.1.3 Objectives of the guidelines

The objective of these guidelines is to facilitate the appropriate siting/planning/design of development so as to avoid/mitigate significant impact on the **favourable conservation status** of the South Hams SAC; this will be achieved by managing development to ensure that there is **no disturbance to greater horseshoe bat strategic flyways or sustenance areas**.

Proposed development, of a certain scale or type, in a strategic flyway or sustenance area will trigger a series of bat surveys. Section 5 provides a survey specification detailing the requirements for the requisite bat surveys. **The survey data will determine the impact of the proposed development on the strategic flyways or sustenance area.** This information will be required to properly assess the proposals and to formulate effective mitigation and **establish a monitoring programme during and post development.** Such mitigation and monitoring during and post development will be administered through either a planning condition or a S106 agreement or both (these conditions shall need to be carefully worded to ensure that there is no scope for misinterpretation)."

**A monitoring plan should be put in place to assess whether the bat population has responded favourably to the mitigation.** It is important that consistent monitoring methods are used pre- and post-development, to facilitate the interpretation of monitoring data.

With respect to strategic flyways and sustenance zones, greater horseshoe bats are susceptible to certain changes in the landscape. These include:-

1. **Removal of linear features used for navigation**
2. **Illumination**
3. **Physical injury by wind turbines**
4. **Change in habitat structure and composition**

The planning development proposals will need to demonstrate that there will be no detrimental impact upon the ability of the greater horseshoe bats to navigate and feed by affecting the ecological impacts identified above.

The strategic flyways connecting key SAC roosts through urban areas/urban fringe with the surrounding countryside are particularly sensitive to change and development pressure. This "pinch point" scenario is based upon the assumption that there are likely to be a shortage of suitable commuting features in and around urban areas. In other words, suitable commuting features in these situations are likely to be particularly important due to a lack of alternative commuting features.

#### **2.1.4 Legal guidance following an Appropriate Assessment**

In the light of the conclusions of the assessment of the project's effects on the site's conservation objectives, the decision-taker must determine whether it can ascertain that the proposal will not adversely affect the integrity of the site(s). The integrity of a site is the coherence of its ecological structure and function, across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified." (ODPM Circular 06/2005)

In the Waddenzee judgement, the European Court of Justice ruled that a plan or project may be authorised only if a competent authority has made certain that the plan or project will not adversely affect the integrity of the site. "That is the case where no reasonable scientific doubt remains as to the absence of such effects". Competent national authorities must be "convinced" that there will not be an adverse affect and where doubt remains as to the absence of adverse affects, the plan or project must not be authorised, subject to the procedure outlined in Article 6(4) of the EC Habitats Directive regarding imperative reasons of overriding public interest." (ODPM Circular 06/2005)

END OF EXTRACTS

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### 3. Summary of current status

**3.1** The South Hams SAC holds over 1,000 adult greater horseshoe bats (*Rhinolophus ferrumequinum*), 31% of the UK population of this species. It contains the largest known maternity roost in the UK, perhaps in Europe (JNCC 2011), and major hibernation sites. The bats forage over much of the surrounding countryside and rely on hedgerows, woodland and treelines, collectively often known as flyways, to move between roosting and foraging sites. Whitecleaves Quarry is a proven strategic flyway, within a sustenance zone, and within 700 m of the *Buckfastleigh Caves* component of the SAC. The flyway is likely to be a sensitive "pinch point", given its location close to Buckfastleigh itself. Part of the site is within the Potter's Wood SSSI, which is also designated for greater horseshoe bats: caves in the wood, 200-400 m from the quarry are known hibernation sites of both greater and lesser horseshoe bats (*Rhinolophus hipposideros*) and certainly other species. Other components of the SAC are 2.5-5 km away. The home foraging range of the greater horseshoe bat varies considerably, but can exceed a 5 km radius circle around the roost. Duverge and Jones (1994) suggest that it is important to maintain or improve key habitats within 4 km of the roost.

**3.2** The survey work conducted as a necessary part of the quarry development has shown conclusively that a significant proportion of the SAC's greater horseshoe bats use the quarry for commuting. High levels of greater horseshoe bat activity were recorded in all survey years "along peripheral tracks, woodland edges and within the central void of the quarry". In 2010 up to 143 greater horseshoe bats commuted along the track on the northern boundary of the quarry. It was concluded that the tracks and associated woodland around the quarry void are 'important to the permeability of the landscape for greater horseshoe bat by connecting foraging habitats and roost sites, including the designated sites of Potters Wood SSSI and Buckfastleigh Caves SSSI'.

**3.3** At least ten bat species have been recorded within the quarry boundary: greater horseshoe, lesser horseshoe, common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus*), Nathusius' pipistrelle (*P. nathusii*), brown long-eared bat (*Plecotus auritus*), barbastelle (*Barbastella barbastellus*), serotine (*Eptesicus serotinus*), Daubenton's bat (*Myotis daubentonii*) and at least one more unidentified *Myotis* species. Although I have some doubts about the ability of the equipment used in the surveys to make definitive identification in many cases (see below) these are all species I would expect to find in this habitat in this part of the country.

**3.4** All parties agree that without mitigation the scheme will have an adverse effect on greater horseshoe bats from the SAC. It is therefore critical that the proposed mitigation measures are effective. In *Hart District Council v Secretary of State for Communities and Local Government* (2008) (EWHC 1204) paragraph 61 states: "effective mitigation of adverse effects on Natura 2000 sites can only take place once those effects have been fully recognised, assessed and reported". I will therefore examine the proposed mitigation plans and assess their likely effectiveness.

### 4. Comments on Environmental Statement (ES) and appraisal of Mitigation Plans

#### 4.1 Survey

The survey work conducted up to 2011 is considered to provide a robust baseline for ecological impact assessment [ES 7.1.2]. It is worth noting that the level of survey falls below that recommended by the Bat Conservation Trust (2012) and the South Hams guidelines (Sclater 2010). I believe that the survey work is in general sufficient to say with certainty that the site is very important to greater horseshoe bats. However, it has deficiencies. The survey equipment (BatBox Duet bat detector) is not up to the task, leaving considerable (I would say unacceptable) subjectivity in species identification for all but the two horseshoe species. Surveys to identify possible rock

crevice roosts [ES 7.3.1] are inadequate. Use of even major roosts can be ephemeral and such low level survey is more likely to miss a roost than find it.

There is uncertainty about the status of the roost in the workshop [ES 7.3.12] due to inadequate survey. It is possible that a roost has already been disturbed without appropriate mitigation.

#### **4.2 Removal of vegetation and replanting**

**4.2.1** It is important to note that significant changes in commuting pattern occurred between 2008/9 and 2010 and it was suggested (URS Scott Wilson 2011) that this is likely due to vegetation clearance, indicating unauthorised disturbance to the site. The clearing of vegetation at this time was also raised as an issue by a letter to NE from the Buckfastleigh Community Forum, which included photographic evidence. This is also raised as a major concern in a letter from NE to DCC on 13 September 2011. Photographic evidence for this disturbance provided by the Buckfastleigh Community Forum is very persuasive: an offence may already have been committed.

**4.2.2** [ES 7.5.2] "No trees or shrubs will be removed other than those located on the Dolerite spur. Tree specimens will be re-planted where possible and used to enhance the bat flight corridor. Mature trees will be retained where possible and a suitable root protection zone established."

Two uses of the term 'where possible' in so short a statement does not inspire confidence. Tree and shrub removal has probably degraded the site's value to greater horseshoe bats already [ES 7.4.46]. Given the bats' extreme reliance on flyways, detailed plans should be produced. The DWC Mitigation Strategy document (2009) states:

"Vegetation planting to be undertaken along the perimeter of all the remaining vegetation adjacent to the identified greater horseshoe track way flight lines, immediately following any vegetation removal/clearance. This planting should comprise native shrub species creating dense sheltered, woodland edge habitats."

Guidance on the age/size or density of planting is not given in this section, but in the section New Hedgebank Planting, it is proposed to use two year old plants, with the expectation that it will take three years to establish and many more before it is an effective flyway for greater horseshoe bats. Unless damage to the flyway is repaired, like with like, it may well have been abandoned before new planting matures, with impaired access to foraging habitat, to the detriment of the bat population. I am aware of only one study that has objectively examined this issue. Bontadina *et al.* (2005) attempted to guide lesser horseshoe bats along a new hedge constructed from 1-3 m high shrubs in pots, direct from their roost, to woodland 200 m away. This hedge attracted an average of only 6% of the 280 bats emerging from the roost after six weeks in place.

**4.2.3** Inadequate planting plans are raised by NE in their letter to DCC (13 September 2011), which recommends that a substantial, established hedge should be in place prior to work commencing.

Some of these concerns are raised in the DWC Bat Activity Survey:

*"The track way flight lines located within the western extent of the survey area will be opened up, connecting to the adjacent quarry void and woodland clearing. This will increase the level of exposure within these track ways, influencing the identified flight lines, potentially reducing the suitability for greater horseshoe bats."*

*"It is noted that the re-established track way boundary may only be reinstated following mining works, which is estimated to take 5 years to complete. During this period the track way flight line will incur a higher level of exposure than present."*

*"It is noted that this wetland and associated planting will only be reinstated following mining works, which is estimated to take 5 years to complete."*

Five years is too long to wait – impact on the bats will be immediate. As discussed in 4.2.1, there may already have been a major impact due to unauthorised vegetation clearance, compounding the problem.

**4.2.4 Summary:** The proposed vegetation removal and replanting plans are inadequate and likely to result in loss or serious degradation to an important greater horseshoe bat flyway.

### **4.3 Lighting**

**4.3.1** Horseshoe bats, and some other species, avoid lit areas (Stone et al. 2009). The DWC Mitigation Strategy suggests that light levels on flyways are maintained below 3 lux. There is some debate in the extensive correspondence of this case as to whether this should be 1 lux. I am unaware of any work, published or unpublished, that specifically investigates this threshold. However, Stone *et al.* (2009) report that increasing light levels along a hedgerow to 4.2 lux, 1.75 m above the ground, reduced lesser horseshoe bat activity almost to zero. Ambient light levels in their study averaged 0.45 lux. Applying the precautionary principle, 1 lux is far more appropriate than 3 lux and indeed even 1 lux may be too much. NE, in their letter to DCC (13 September 2011) suggest there should be no light spill.

**4.3.2** Recommendations on hoods/cowling and other ways of limiting light spill are vague. A cowl cutting light 1 m above ground may be effective, one at 2 m much less so. It is also not stated where critical light levels are to be measured or how – light intensity changes dramatically with distance from the source. Similarly, guidance re lighting "where three tracks meet at the entrance to the quarry" is similarly vague – "lighting should be limited in this area and within a 10 m radius". Vague guidance often leads to interpretation and outcomes that fall far short of effective mitigation.

**4.3.3** The email from Kestrel Wildlife Consultants on 20 November 2011 suggests other unresolved issues, such as light spill in the area of the portacabin offices and suggests solutions such as the construction of a fence. Clearly, lighting issues are unresolved. I note concern about possible light spill from an already approved coach park adjacent to the site that compounds the problems.

**4.3.4 Summary:** The proposed measures to avoid unacceptable light pollution are inadequate and inspire little confidence.

### **4.4 On site traffic and other disturbance**

**4.4.1** The increase in HGV movements on the adjoining road is expected to be 70%. The noise, light, vibration and obstruction from these vehicles is likely to deter bats. This is particularly problematic at dawn and dusk during spring and autumn, when bats will be active during normal working hours. Operational times are given as both 10 and 12 hours: either way these will include significant 'night time' work. The argument that the effects on the few bats active at this time will be minimal, is spurious. Repeated disturbance of bats attempting to make pre- or post-hibernation foraging trips on emergence from hibernation could greatly affect their condition. Greater horseshoe bats are known to emerge and feed regularly during hibernation when weather conditions permit (Park et al.

1999, 2000). Any operations outside normal working hours could have a very serious impact on the bats. Is there potential disturbance outside operational hours, from machinery, security lights, etc? This is not addressed.

**4.4.2 Summary:** On site traffic and operational disturbance could be a significant deterrent to bats.

#### **4.5 Rock spur removal and blasting**

**4.5.1** There is a major potential effect of the removal of the rock spur. It is an integral part of a flyway and major effort would be required to maintain flyway continuity during and after blasting and related work. No thought at all appears to have been given to this.

**4.5.2** The effects of blasting are uncertain. There is an unresolved debate about when best to blast – avoiding or selecting the winter hibernation period. Measurements from trial blasting may give little idea of the possible consequences to hibernating bats – we do not have data to tell us what they can tolerate. However, since the rock spur is on a commuting route, it is difficult to see how it could be removed during the summer months when bats are routinely commuting along it.

**4.5.3** Is there a strong economic or operational reason for the removal of this spur? I found no discussion of why this space was needed (and needed in this location) and why alternatives would not work.

**4.5.4 Summary:** Given the potential for major disturbance and difficult mitigation, and applying the precautionary principle, it would seem that the best strategy is not to blast at all.

#### **4.6 Construction phase**

**4.6.1** Measures to prevent disturbance from light, noise, vehicles, dust, etc. during the construction phase are absent. This is a serious omission. Irreparable damage could be done from the start. Damage may already have been done by on-site work since 2008.

**4.6.2 Summary:** I have serious concerns about the absence of a detailed and convincing plan and timeline for construction phase work and mitigation.

#### **4.7 Other species of bat**

Extract from NPA/DM/11/049, 7 October 2011, from the Darroor National Park Authority

“In addition to concerns regarding the greater horseshoe bat, impacts upon a barbastelle bat maternity roost within the National Park are not considered to have been adequately assessed. A radio-tracking study indicates that barbastelle bats, known to originate from one of the two maternity colonies within the National Park, are foraging in close vicinity to the quarry. The ES does not adequately assess whether the proposal could have an impact upon the bat colony within the National Park.”

The surveys may not have revealed the importance of the site to this species, since the bat detector used to conduct the work is unlikely to identify it with any certainty.

#### **4.8 Monitoring**

**4.8.1** From Sclater (2010): “A monitoring plan should be put in place to assess whether the bat

population has responded favourably to the mitigation. It is important that consistent monitoring methods are used pre- and post-development, to facilitate the interpretation of monitoring data.”

On monitoring, the DWC Mitigation Strategy states:

“Monitoring will comprise of two Bat Activity Surveys undertaken during the optimum bat activity period, June to August inclusive. It is recommended that monitoring should commence when the proposed development works commence, and continue for a period of 5 years.”

**4.8.2** This is inadequate on several counts. (i) Two surveys over three months, given the considerable night to night variation in activity typically observed, will not be sufficient to detect changes in use. By the time sufficient data have been collected to detect a possible decline in activity considerable damage may have been done. (ii) It would be difficult to use existing pre-construction monitoring data to establish a useful baseline. Methods are not given in sufficient detail to allow them to be repeated and data are not presented in a form that makes them amenable to quantitative analysis. Additional pre-construction monitoring would need to be comparable with post construction follow-up. (iii) No methodology is given for future monitoring. Based on an extensive review of past monitoring work (Altringham 2008) there is a strong likelihood that it will be unfit for purpose. It is also often the case that later monitoring is done by another consultancy, using different equipment, methods and protocols (Altringham 2008), compounding the problems. A focused and concise methodology, based around clearly stated objectives is needed. If mitigation is to be effective it needs to be shown that bat activity levels and behaviour do not change significantly after construction. As it stands, all we will know is whether some bats are still present.

**4.8.3 Summary: There is no detailed monitoring plan, indeed, no monitoring plan at all!**

#### **4.9 General comments**

There is a general tone of unfounded optimism that minimal mitigation, lacking an evidence-base for success, will protect the bats from further disturbance. Because of this confident approach, there is no attention to detail, there are no clear goals and no plan to monitor the effects of the development and take appropriate action should mitigation be seen to be failing.

My views are in broad agreement with those of the national park ecologist:

**Extract from NPA/DM/11/049, 7 October 2011, from the Darroor National Park Authority**

“The Authority’s Ecologist disagrees with the applicant’s conclusion that the proposed development would not impact upon greater horseshoe bats and thus the SAC, this is specifically due to:

- Habitat loss and mitigation - particularly inadequacies in the provision of new hedgerow planting
- Lighting levels - a proposed level which significantly exceeds best practice and would likely have a detrimental impact upon commuting bats
- Blasting - whilst this has been subject of some debate the current proposals are not considered to be acceptable in respect of [the time of year for blasting] which would not minimise impact upon bats
- Monitoring - there is no clear monitoring strategy for the impact upon bats
- Impact on Potter’s Wood SSSI - specifically hydrology, and the consequential impact upon the South Hams SAC bat population.”
- 

The above concerns are echoed by Natural England in its response to the County Council.



## 5. Conclusions

5.1 The *National Planning Policy Framework* (2012) (1.10 above) exempts developments requiring appropriate assessment under the Birds or Habitats Directives from the “golden thread” of presumption in favour of sustainable development. Given the enormous international importance of the greater horseshoe bats of the South Hams SAC, there should be “no reasonable scientific doubt” (see 5.3) about the effectiveness of the mitigation plans if this development is to proceed. As they stand, the plans give no such guarantee. It is more likely they will fail.

5.2 From the Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC (my embolding):

**“(76) In accordance with the precautionary principle, if the measures proposed do not guarantee the continued ecological functionality of a site, they should not be considered under Article 12(1)(d) [which requires strict protection and prohibits habitats from deterioration or destruction]. There must be a high degree of certainty that the measures are sufficient to avoid any deterioration or destruction. The assessment of the probability of success must be made on the basis of objective information and in the light of the characteristics and specific environmental conditions of the site concerned. In addition, the use of CEF measures has to take into account the conservation status of the species concerned. For example, in the case of rare species with an unfavourable conservation status, there must be a higher degree of certainty that the measures will work as intended than in the case of more common species with a favourable conservation status.”**

5.3 From Sclater (2010) “In the Waddenzee judgement, the **European Court of Justice ruled that a plan or project may be authorised only** if a competent authority has made certain that the plan or project will not adversely affect the integrity of the site. “That is the case **where no reasonable scientific doubt remains** as to the absence of such effects”. Competent national authorities must be “convinced” that there will not be an adverse affect and where doubt remains as to the absence of adverse affects, the plan or project must not be authorised, subject to the procedure outlined in Article 6(4) of the EC Habitats Directive regarding imperative reasons of overriding public interest.” (ODPM Circular 06/2005)

5.4 Summary: There is considerable scientific doubt over the success of the mitigation plans and in my view the plan should not be authorised.

## 6. References

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## 7. Brief CV: John Altringham

Professor of Animal Ecology and Conservation, University of Leeds

Over 30 years of experience of research and teaching in zoology, ecology and conservation. I am particularly concerned, as a scientist, with improving standards in conservation through objective, evidence-based research.

Author of three books on bats and over 100 scientific papers on bats and other biological topics. Practicing conservationist and a regular advisor to conservation agencies and charities. I have been a member of a wider range of advisory groups and panels and work closely with many agencies. For example I am currently a member of the Yorkshire Dales Biodiversity Forum and the National Trust's Natural Environment Panel.

**Comments, in relation to bat conservation, on report from Head of Planning,  
Transportation and Environment**

**(PTE/12/29 Development Management Committee 25 April 2012)**

**John Altringham, *Professor of Animal Ecology and Conservation*, University of Leeds**

**General comment: the application is being approved on the basis of an unfinished and contentious mitigation plan for an SAC bat population.**

**Specific points:**

**6.64**

**"The NPPF requires that the planning system should protect and enhance valued landscapes, geological conservation interests and soils, should recognise the wider benefits of ecosystem services, minimise impacts on biodiversity and **provide net gains in biodiversity where possible**, contributing to the Government's commitment to halt the overall decline in biodiversity. It **promotes the establishment of coherent ecological networks that are more resilient to current and future pressures....**"**

**I see no evidence to suggest there will be any gains. Inadequate mitigation to disrupted flyways will contribute to the breaking not establishment of an ecological network.**

**6.65**

**"Additionally the NPPF makes it clear that when determining planning applications Planning Authorities should refuse permission if significant harm results from a development that cannot be avoided, mitigated or compensated for."**

**The development is likely to lead to significant harm of a protected species in an SAC through inadequate mitigation. The development can be avoided. Acceptable mitigation is in principle feasible, but compensation is not.**

**6.66**

**"..... a further document from the applicants relating to ecological mitigation, enhancement and monitoring which has been **slightly altered and renamed** as the Landscape and Ecological Management Plan (LEMP) following consultation with NE."**

**The "slightly altered and renamed" document remains inadequate for the many reasons given in my full assessment of the mitigation plans.**

**6.67**

**"The peak count of 143 bats flying through the site on one night in 2011 represents just over 8% of the total population of Greater Horseshoe bats breeding at Rock Farm (within the SAC)."**

**There is no reason to believe that the peak count on the few nights that surveys were carried out represents a true peak.**

6.69

"The County Council (with advice from Natural England) has undertaken a Habitats Regulations Assessment to ascertain the impact of the development on the two SACs. This concluded that: (1) provided mitigation measures (such as no removal of vegetation along the flight line and no lighting disturbance to the flight line) set out in the Landscape and Ecological management Plan are secured through conditions, the proposal will not have an adverse effect on the integrity of the South Hams SAC."

Vegetation has already been removed. Planting plans in the LEMP are inadequate (see my report), a monitoring plan is absent and there are no contingencies plans should mitigation be seen to be failing.

6.70

"The Applicant has also proposed measures to enhance the flight line for Greater Horseshoe Bats e.g. further planting."

Again, I have strong reasons, supported by evidence, that the planting proposed will be inadequate.

8.2

"The main concerns of residents regarding health, highway use, ecology and road safety, as well as concerns about emissions and general amenity, have not been supported by the responses from statutory consultees."

This would not be my interpretation of the documentation related to bats and is not the conclusion I have come to in my detailed report.

### Appendix III

#### Condition 1

The development hereby permitted shall be commenced within 3 years of the date of this permission.

The current mitigation planting scheme for commuting bats is unlikely to provide an adequate flyway in three years (see my report).

#### Condition 7

With the exception of bona fide "emergency out of hours operations" as specified in Condition 8 the site shall be open to site personnel only during the hours 07.30 to 18.30 Monday to Friday and 07.30 to 13.00 pm Saturday.

Greater horseshoe bats are unusual among bats in feeding (albeit at very reduced levels) throughout the winter and particularly at the beginning and end of hibernation. Lights at dusk and dawn on their commuting routes are likely to cause disturbance at times when food is scarce and disruption to foraging may significantly affect survival.

**Condition 8**

Notwithstanding the provisions of Condition 7 above, the applicant may access the site out of hours to collect equipment for bona fide emergency demolition contracts.

This could be a significant source of disruption to commuting bats, and one that the SNCO will not be made aware of.

**Condition 9**

Blasting (including blast testing and trial blasting) shall not take place during the period of 1st December to 31<sup>st</sup> August (inclusive) **unless the applicant can demonstrate no disturbance to significant numbers of bats or nesting birds** and permission to blast outside these dates has subsequently been given in writing by the Waste Planning Authority.

How will this be established?

**Condition 10**

Prior to the commencement of any blasting operations (including test blasting) on this site the operator shall submit to and have approved in writing a blasting scheme to include the following information:

(ii) **The methodology for assessment of impact on protected species, sensitive properties and locations and the minimisation of such identified impacts;**

Who will approve this methodology?

**Condition 41**

The planting indicated on drawings [*to be confirmed*] and referred to in [*paragraph to be confirmed*] of the Landscape and Ecological Monitoring Plan (LEMP) shall be implemented in the first planting season following the commencement of the relevant phasing of the development.

How can planting schemes not yet confirmed be considered acceptable? I have given evidence in my report to show that those currently described for the flyways are not likely to be fit for purpose. If implemented in the first season following commencement of development the small plants proposed are very unlikely to provide an adequate flyway.

**Condition 42**

Any tree or shrub forming part of a landscaping scheme approved in connection with the development (under Condition 41 of this permission) that dies, is damaged, diseased or removed **within the duration of 5 years during and after the completion of the development [operations]** shall be replaced during the next available planting season (October to March inclusive) with a tree or shrub to be agreed in advance in writing by the Waste Planning Authority.

Does this mean that after 5 years damaged or removed trees on flyways need not be replaced? This could lead to progressive destruction of flyways.

PTO

**Condition 43**

No development shall take place until details of tree and hedgerow retention and protection have been submitted to and approved by the Waste Planning Authority. The details shall include a plan of all existing trees, shrubs and hedgerows on the site and on the immediate adjoining land together with measures for their protection. The approved details shall be implemented and maintained for the period of construction of the development.

Is the Waste Planning Authority competent to make decisions on planting for conservation purposes? Would they necessarily recruit someone competent?

**Condition 44**

The development hereby permitted shall be implemented in accordance with the Landscape and Ecological Management Plan (LEMP) dated *[to be confirmed]* in all respects unless otherwise agreed in writing by the Waste Planning Authority. This document shall be updated as requested by the WPA to include the results of the revised monitoring programme, blasting details and a revised timetable for ecological works.

Is it indicative of the level of commitment and competence to nature conservation that the LEMP is still unfinished at this late stage?

Is the WPA competent to assess work done for bat, or indeed other, conservation?

**Condition 46**

Before the development hereby permitted commences the applicant shall submit to the WPA and have approved in writing a detailed monitoring programme and methodology.

Is the WPA competent to assess bat monitoring and methodology?

**Condition 47**

Any lighting on this site shall be installed and maintained in accordance with the lighting mitigation plan contained within the Landscape and Ecological Management Plan and the submitted lighting plan drawing D134633 E01C. At no times shall the levels of illuminance on the site exceed the indicated levels on this plan and there shall be no further lighting installed on the site without the prior written consent of the WPA.

It is not clear to me that an acceptable lighting scheme has been agreed.

Is the WPA competent to assess lighting schemes for bats?

PTO

#### Appendix IV

##### 8. Potential impact on GHB strategic flyway

"An important commuting route has been identified through the western side of the site (*Greater Horseshoe bat monitoring surveys*, URS, 2011). The peak count of 143 bats in 2011 represents just over 8% of the total population of Greater horseshoe bats breeding at Rock Farm (within Buckfastleigh Caves SSSI)."

As stated earlier, there is no reason to believe that the peak count on the few nights that surveys were carried out represents a true peak.

"Potential threats to the viability of the flight line are from lighting, loss of tree and scrub cover along the route, physical obstructions and increased disturbance. Impacts on the flight line would present a threat to the SAC population by limiting / blocking access to foraging grounds and other major roosts in the wider landscape. It cannot therefore be ascertained (without agreed mitigation) that the proposal will not have a likely significant effect on the SAC alone."

The mitigation plan is unfinished, flawed in several respects and lacks a monitoring plan. There is therefore considerable uncertainty about the outcome. On this basis alone it is difficult to see how the plan can be approved.

##### 9. Conclusion

"Impacts on flight lines: The western edge of the site has been identified as a significant commuting route for Greater Horseshoes. Impacts on this flight line may limit / block critical access to the wider landscape and are likely to have a significant effect, alone, on the South Hams SAC. An appropriate assessment of the implications of the proposal for the site must therefore be carried out."

Current plans are inadequate and need not be examined further – they must be improved in the light of considerable criticism and re-examined.

---

**From:** Cate Jackson  
**Sent:** 18 April 2012 16:28  
**To:** Stephen Belli  
**Cc:** Daniel Janota; David Lillington  
**Subject:** RE: Whitecleave Quarry proposal

Hi Steve

I have forwarded the bat consultant's report that we received today from Buckfastleigh Community Forum to Sue Penaluna at DCC. DCC had not received it and were not aware of it. However, given that the consultant's report does not refer to the latest information held by DCC ie the Landscape & Ecological Management Plan April 2012 or the Appropriate Assessment, the consultant may need to review his comments in light of this information, as it addresses many of his concerns. The Appropriate Assessment has been completed by DCC and it concludes that this proposal will not have an adverse effect on the integrity of the South Hams SAC. Natural England are satisfied with this conclusion.

As such, my ecological comments submitted to DCC on 11 April still stand.

For your information, here is a link to Sue Penaluna's Committee report with the supporting documentation  
[http://www.devon.gov.uk/index/councildemocracy/decision\\_making/cma/cma\\_document.htm?cmadoc=agenda\\_dvc\\_20120425.html](http://www.devon.gov.uk/index/councildemocracy/decision_making/cma/cma_document.htm?cmadoc=agenda_dvc_20120425.html)

Please can you respond to Neil Smith's email below and summarise the points I have mentioned where you see fit. I suggest any further correspondence from Mr Smith be forwarded to Sue Penaluna of the acting authority.

I'm back at work on Monday if there are any queries. I believe Dan is back on Tues?

Thanks  
Cate

Cate Jackson

---

**From:** Stephen Belli  
**Sent:** 18 April 2012 12:44  
**To:** Cate Jackson  
**Subject:** RE: Whitecleave Quarry proposal

Please do so. Is there anything in what Mr Smith is saying?

*Stephen Belli*  
Director of Planning  
Dartmoor National Park Authority  
Direct Line 01626 831017  
Fax number 01626 834684

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---

**From:** Cate Jackson  
**Sent:** 18 April 2012 12:42  
**To:** Stephen Belli  
**Subject:** FW: Whitecleave Quarry proposal  
**Importance:** High

Hi Stephen

Can I forward this document to DCC Ecologist and DCC Case Officer Sue Penaluna? They should already have it if we've been given it, but I want to ensure they are aware of it given they're the acting Authority.

Wait to hear from you on this.

Cate

---

**From:** Neil Smith  
**Sent:** 18 April 2012 12:36  
**To:** Stephen Belli  
**Cc:** Cate Jackson; Stuart Barker-ext; Philip Vogel; John Nutley; 'Buckfastleigh Town Council'; [mel.stride.mp@parliament.uk](mailto:mel.stride.mp@parliament.uk)  
**Subject:** RE: Whitecleave Quarry proposal  
**Importance:** High

Dear Stephen,

I am afraid I was not aware of this change of position because Devon County Council have not made public the representation by statutory consultees as should be expected in this instance. This is an unfortunate oversight on their part in terms of the due process of processing this application.

Please can you and the county ecologist review the attached document with some haste as it is clear there remains reasonable scientific doubt as to the ability to mitigate the impact on the South Hams SAC.

This document has been prepared by one of the country's leading bat ecologists, and demonstrate a lack of scientific certainty as to the ability of the SAC to not have its ecological functionality.

I am sorry this document has not been available before, but as I am sure you understand, it is a complex site and requires a formidable amount of work for a community group to co-ordinate.

This document would suggest that any decision to allow the development to proceed will be subjected to legal review as a potential breach of the principle established in the Waddenzee Judgement. You may wish to convene a special meeting of the planning committee to review this evidence and adjust the NPA's stance.

Your urgent attention to this matter would be most appreciated, and please can you ensure this communication is kept on record for the purposes of any potential enquiry into this matter.

Please can you keep me closely informed of any progress in this matter.

Thanks and regards  
Neil

Neil Smith  
co-Chair, Buckfastleigh Community Forum

---

**From:** Stephen Belli [<mailto:sbelli@dartmoor.gov.uk>]  
**Sent:** 18 April 2012 12:10  
**To:** Neil Smith  
**Subject:** Whitecleave Quarry proposal

Dear Mr Smith

Please find attached a copy of my recent letter to Devon County Council regarding the above development.

I have already received a call querying our change of position from a local resident so I wanted to make you aware of the actual position of the National Park Authority.

At its earlier meeting the Authority resolved to object on one ground only - that is the potential impact on nature conservation and protected species. We have now received the additional evidence and assurances we needed from the County Council and the applicants and in this respect there are no longer any grounds for objection. The additional information has been carefully checked by our ecologist in consultation with the County Council and Natural England before we responded.

The other issues the Authority alluded to in its report are still there for the County Council to satisfy itself as planning authority. We raised those issues such as highway impact, potential impact on local amenities and tourism but the National Park Authority did not resolve to object on those grounds.

I trust this helps to clarify our position in this matter.

*Stephen Belli*

Director of Planning  
Dartmoor National Park Authority  
Direct Line 01626 831017  
Fax number 01626 834684

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Dartmoor National Park Authority  
Parke, Bovey Tracey, Newton Abbot, Devon, TQ13 9JQ  
Tel: (01626) 832093  
Fax: (01626) 834684  
E-mail: [hq@dartmoor.gov.uk](mailto:hq@dartmoor.gov.uk)  
Website: [www.dartmoor.gov.uk](http://www.dartmoor.gov.uk)



Mr N Smith, Co Chair  
Buckfastleigh Community Forum

Your ref:  
**Please quote: KB/AH**  
Direct line: 01626 831004

23 April 2012

Dear Neil

**Proposed Construction and Operation of Materials Recovery Facility for Inert Construction and Demolition Wastes; Construction and Operation of Incinerator Bottom Ash Processing Facility; Removal of Dolerite Outcrop and Filling Quarry with Dolerite and Inert Material to a Depth of 60m AOD to Facilitate Storage of Recycled Materials with Associated Site Engineering and Infrastructure, Whitecleaves Quarry, Buckfastleigh**

Thank you for your letter dated 19 April 2012 concerning the above.

As you will know the Authority considered this matter in its role as a consultee on a planning application submitted to Devon County Council who, on this occasion, is the determining Local Planning Authority. A detailed report was prepared and put before the National Park Authority's Development Management Committee on 7 October 2011. At that meeting Members resolved to object on the following grounds:

**... the Authority objects to the application on the grounds that it may impact upon the integrity of the South Hams Special Area of Conservation (SAC)**

In reaching that conclusion Members were fully appraised of the other impacts the proposed development might have and again, these were set out in detail in the report such as.

- Environmental impact, particularly noise, dust and air quality;
- Highway impact from additional HGV movements;
- Socio-economic impact on tourism in the Buckfastleigh area;
- Habitats and protected species;
- Landscape and visual impact.

However, you will note that the Authority did not formally object on any of the grounds listed above, but asked that the County Council take into consideration all these potential impacts and satisfy themselves that permission should be granted, if necessary, subject to appropriate conditions and other mitigation measures.

**Bill Hitchins Chairman Kevin Bishop PhD Chief Executive (National Park Officer)**

The purposes of the Dartmoor National Park Authority are to conserve and enhance the natural beauty, wildlife and cultural heritage of the National Park; and to promote opportunities for the understanding and enjoyment of the area's special qualities. In pursuing these purposes the Authority has a duty to seek to foster the economic and social well-being of the community.  
A Member of the Association of National Park Authorities

The Authority did consider the individual topic areas and how they might impact on the National Park and its residents and businesses.

On the socio economic front the Authority report states the following:

*The operation is estimated to create 12 new jobs; it may also provide other opportunities indirectly, for example, through sub-contracted maintenance. The Environment Statement has assessed the potential impact of the proposal upon local tourism. It concludes that the development does not present any significant threat to the tourism sector on the basis that the impacts of the proposal (such as visual impact, noise, traffic) are assessed as acceptable in the Environmental Statement. However, the potential impact upon the local economy, and in particular tourism, is of concern locally. It is important therefore to consider the perception of impact, which itself could affect the vitality and viability of Buckfastleigh by influencing decision making in the area. Such impacts are very difficult to assess, however.*

*In providing additional employment opportunities in both skilled and non-skilled roles, the benefits of the proposal to the local community are clear. Whether the proposal impacts adversely upon the local economy, including tourism, is dependant on the conclusion that other issues, such as visual impact, noise, traffic etc individually and cumulatively, are assessed as not having a significant impact. Provided the County Council can conclude that these issues are considered to be acceptable, it is considered on balance that the potential economic benefits of the proposal would outweigh any potential adverse effects upon the local tourist economy. Should any of these issues be considered to have a potential significant impact however, this must then also be judged against the potential wider socio-economic impact upon this part of the National Park.*

I am aware of the recommendation that is to be put before the Devon County Council Planning Committee on 25 April and I note from the report that the socio-economic concerns raised by the Authority have been taken into account. The report refers to socio economic impact but concludes there is no firm evidence that the development, if approved, would have the negative impact you claim.

The Authority's Ecologist considered the Landscape and Ecological Management Plan (published April 2012) showing mitigation measures and monitoring plan. On the basis of this plan and the survey work that informed the Appropriate Assessment we wrote to Devon County Council on 11 April 2012 withdrawing our objection, subject to the Appropriate Assessment concluding that this proposal will not have an adverse effect on the integrity of the South Hams SAC.

Our Ecologist has considered the additional information submitted by Professor Altringham last week comments as follows:

*I have forwarded the bat consultant's report, received today (18 April 2012) from Buckfastleigh Community Forum to Sue Penaluna at Devon County Council. Devon County Council had not received it and were not aware of it. However, given that the consultant's report does not refer to the latest information held by Devon County Council ie the Landscape & Ecological Management Plan April 2012, or the*

*Appropriate Assessment, the consultant may need to review his comments in light of this information, as it addresses many of his*

*concerns. The Appropriate Assessment has been completed by Devon County Council and it concludes that this proposal will not have an adverse effect on the integrity of the South Hams SAC. Natural England is satisfied with this conclusion.*

*As such, my ecological comments submitted to Devon County Council on 11 April still stand.*

The Authority's Ecologist has also considered the information regarding the Deptford Pink, which has been forwarded to the County Council.

Notwithstanding the further report, there are no sound grounds for the Authority to maintain its ecological objection.

Again the other concerns you raise in your letter regarding potential pollution through leachate material, potential flood risk, and hazardous waste materials are all matters that the County Council, as the determining Local Planning Authority, need to satisfy itself with.

To conclude, the Authority is keenly aware of the strength of local feeling concerning this application. However, as a consultee on this application it is important that the Authority's position is evidence-based. The report to Authority Members, dated 7 October 2011, (copy attached) highlighted a number of areas of potential impact, but the Authority only formally objected on grounds that the proposed development may impact upon the integrity of the South Hams SAC. Additional information on this issue has been considered by the Authority's ecologists (in discussion with the County Council and Natural England – the Government's statutory advisers on wildlife) and they are satisfied that there will be no significant harmful effect on the South Hams SAC (subject to appropriate conditions of mitigation). Thus, the Authority's reason for objecting to the development has been overcome.

I trust that this letter clarifies the Authority's position.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Kevin Bishop', with a stylized flourish at the end.

Dr Kevin Bishop  
Chief Executive (National Park Officer)  
E-mail: [aharris@dartmoor.gov.uk](mailto:aharris@dartmoor.gov.uk)

Enc

---

**From:** Sue Penaluna [sue.penaluna@devon.gov.uk]  
**Sent:** 24 April 2012 15:03  
**To:** Cate Jackson  
**Subject:** FW: Possibility of the presents Deptford Pink (*Dianthus Ameria*) at Whitecleaves Quarry, Buckfastleigh and threat to existing SSSI and protection of existings population.

Cate, just in case you are also being pursued on this point.  
Sue

-----Original Message-----

**From:** Sue Penaluna  
**Sent:** 24 April 2012 14:51  
**To:** Sue Penaluna; Sclater, Julien R (NE)  
**Subject:** RE: Possibility of the presents Deptford Pink (*Dianthus Ameria*) at Whitecleaves Quarry, Buckfastleigh and threat to existing SSSI and protection of existings population.

Dear

I am pleased to confirm that DCC is conscious of its responsibilities relating to biodiversity, familiar with relevant legislation and guidance and applies these, as it believes appropriate, through the planning process.

Through my former role as DCC County Ecologist, I have long been aware of and involved in issues relating to Deptford Pink in the Buckfastleigh area and, indeed, at other Devon sites. This has involved discussion and meetings with Phil Wilson (who lead much of the original Deptford Pink survey work and who drafted the dossier that you provided the link for), Norman Baldock and others at Dartmoor National Park Authority and ecologists / managing agents for the Highways Agency.

Through these discussions, I had speculated about the potential presence of Deptford Pink at other sites around Buckfastleigh, including along or to the south of the A38 Expressway. However, Deptford Pink wasn't found during vegetation surveys on the verges / cuttings along the A38 in this area. The general view expressed at the time was that land to the south of the A38 was unlikely to be particularly suitable for Deptford Pink because of its northerly aspect. The experience at the Buckfastleigh site also suggests that, whilst the spread of the plant can occur (i.e. naturally, as well as via the 'helping hand' that it received here), this tends to be only over short distances. During my own, personal, visits around the Buckfastliegh area, I have looked for, but not encountered, Deptford Pink away from its known locations.

Whilst I am not aware of any specific surveys for Deptford Pink having been carried out at Whitecleaves Quarry, general ecological surveys / assessments have been undertaken on more than one ocassion in recent years, but no records of Deptford Pink have been documented here; as the ecological reports supporting the planning application confirm, the ecological consultants were aware of the presence of this species in the Buckfastleigh area. During my own visit to Whitecleaves Quarry some years ago I was disappointed by the lack of open ground supporting a dry grassland flora which might provide suitable conditions for Deptford Pink and other floristic interest; this partly reflects the speed at which scrub and tree growth has encroached across large parts of the site.

Based on the above, our current County Ecologist and I do not consider it to be necessary or appropriate to require a specific survey of Deptford Pink at Whitecleaves Quarry prior to the determination of this planning application. Even if a survey were thought appropriate, health and safety considerations would make this impossible in the locations (i.e. ledges supporting a sparse flora on some of the exposed main rock faces) which might, potentially, provide the right sort of habitat conditions for this species.

Neither, in our view, do the proposed operations present any risk to the existing populations of Deptford Pink found at the sites on the north-eastern fringe of Buckfastleigh. Your assertion that Deptford Pink requires acidic soils is incorrect and does not match the references within the dossier, the specific conditions associated with some of the existing Buckfastleigh sites nor, indeed, other Devon locations where Deptford Pink is found directly on limestone. Whilst it is very good news that Deptford Pink has fared well at these Buckfastleigh sites over the last 10 years or so, there is no evidence to suggest any connection with the cessation of quarrying at Whitecleaves; instead, positive management of these existing sites is more likely to account for this situation.

Yours sincerely

**Peter Chamberlain – Environment Manager**

*Planning, Transportation and Environment Group*

*Devon County Council | Lucombe House | County Hall | Topsham Road | Exeter | EX2 4QD*

*Tel: 01392 382257 | Fax: 01392 382135 | E-mail: [peter.chamberlain@devon.gov.uk](mailto:peter.chamberlain@devon.gov.uk)*



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-----Original Message-----

**From:**

**Sent:** 23 April 2012 21:58

**To:** Peter Chamberlain

**Cc:** Buckfastleigh Community Forum; [sbelli@dartmoor.gov.uk](mailto:sbelli@dartmoor.gov.uk); Planning, Development Management - Mailbox; Sclater, Julien R (NE); [richard@richardbenyon.com](mailto:richard@richardbenyon.com)

**Subject:** Possibility of the presents Deptford Pink (*Dianthus Ameria*) at Whitecleaves Quarry, Buckfastleigh and threat to existing SSSI and protection of existings population.

Dear Mr Chamberlin,

I am very concerned at the apparent lack of activity surrounding the current and possible future impacts of the Whitecleaves quarry application. I would like to point out several bullet points that should have initiated investigations under current BAP's and Section 8 of the countryside act. I do not wish to teach people their jobs but since I have started investigations into "due process" carried out by relevant bodies regarding Deptford Pinks the most common phase I have heard is "unaware". This quite is unacceptable as a defence, as actions and a provable documented line of enquiry are required. The use of language such as "being aware of the Deptford Pinks but unaware of any in the quarry" when intended as advice to the Planning Department when they have to base their recommendations on such advise is, misleading. The site hasn't been surveyed specifically for *Dianthus Ameria* since this process began if at all. The DNPA have, over the past fifteen years documented the situation regarding the Deptford Pinks within the SSSI which is within DNPA borders. Unfortunately, Three planning jurisdictions and three District Councils meet within a 100 metres or so, the quarry is just outside the DNP. I believe that all other authorities have relied on the DNPA looking after the interests of the Depford Pinks.

I strongly believe that the quarry is a possible site for *Diantus Ameria* as the area has the favoured traits required by the plants and is a short distance from their existing site, certainly close enough for migration to take place. In the absence of any formal survey data available for the quarry to prove whether or not they are present I formally request that a one is instigated, immediately.

Please be aware that there is a potential risk from the works outlined in the application to the well being of the plants at the existing SSSI site which also needs clarifying and documenting and again seems to have gone unnoticed. According to a BAP dossier on the *Dianthus Ameria* the plants require acidic soils. The proposed/existing operations of concrete crushing produces Alkaline dust and the proposed open air storage piles of bottom ash are initially highly alkaline. The blasting 250,000 tons of Limestone to prepared the site will be slightly Alkaline (reference Prof. Tim Drey - Organic chemist with extensive experience in none organic chemistry). The best qualified body to advise on the effects these alien practises will have on the environment and soil Ph values are probably the 'Soil Association'.

I would like to highlight that the population Dianthus Armeria has flourished in recent years and is possibly due in part to cessation of quarrying at Whitecleeves.

The above should have been addressed by the applicant or regulatory bodies and I am not privie to any documented evidence to suggest that they have been. I consider this email to be due notice of the above and ask that you instigate the relevant processes as outlined on your website.

[http://www.devon.gov.uk/index/environmentplanning/natural\\_environment/biodiversity/wildlife\\_guidelines/identifying\\_requirements/legally\\_protected\\_species\\_question.htm](http://www.devon.gov.uk/index/environmentplanning/natural_environment/biodiversity/wildlife_guidelines/identifying_requirements/legally_protected_species_question.htm) ,please let me know if there is anything I can do to assist in this matter.

It is imperative for the future of the plants and the law that we establish unequivocally that "no harm" is done as a result of this application.

Thank you in anticipation of your cooperation.

Yours,







**Whitecleave Quarry**

**Landscape and Ecological  
Management Plan**

**16 April 2012**

**47061773.MIMO**

Prepared for:  
MVV Environment Devonport  
Ltd and Sam Gilpin  
Demolition Ltd

UNITED  
KINGDOM &  
IRELAND



REVISION SCHEDULE					
Rev	Date	Details	Prepared by	Reviewed by	Approved by
3	16/04/12	Report to DCC	Simon Geary Principal Ecologist	Tamsin Wray Principal Environmental Consultant	Tamsin Wray Principal Environmental Consultant

URS  
Floor 3 Mayflower House  
Armada Way  
Plymouth  
PL1 1LD  
United Kingdom

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## INTRODUCTION

### Terms of reference

This report has been produced in order to support a planning application by MVV Environment Devonport Ltd for the proposed development of an Incinerator Bottom Ash (IBA) Facility and Materials Recycling Facility (MRF) (hereafter referred to as “the scheme”) at Whitecleave Quarry, Buckfastleigh, Devon and to help Devon County Council and Natural England identify those measures relating to ecological mitigation and compensation measures which form the final proposals by MVV and SGDL for the Whitecleave Quarry MRF and IBA processing. The document does not contain any new proposals.

This report incorporates the existing information contained in the Environmental Statement for the scheme and its supporting documentation covering ecological mitigation and monitoring proposals for habitats and protected species.

This report has been produced by URS Infrastructure and Environment Ltd based on ecological desk study and specialised habitat and protected species surveys undertaken by the Devon Wildlife Consultancy between 2008 and 2010 and by URS / Scott Wilson Ltd during 2011. A list of ecological survey reports referred to in order to produce this report is provided in the Bibliography.

The report covers all ecological mitigation and monitoring on site and off site compensatory planting in Potter’s Wood SSSI. The report is based on detailed consultation with Natural England and Devon County Council on mitigation and compensation requirements for the scheme. The Whitecleave Quarry Ecological Mitigation Schedule<sup>1</sup> is provided in Appendix 1.

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<sup>1</sup> The mitigation timing for dormouse *Muscardinus avellanarius* is generic at time of writing and is to be further detailed, tailored to the site and confirmed with Natural England EPS licensing team during the EPS licence application process.

## POTENTIAL ECOLOGICAL IMPACTS OF THE SCHEME

The following potential ecological impacts of the scheme will be fully mitigated or compensated and are addressed in this report:

- Loss of 0.37 ha of semi-natural broad-leaved woodland habitat
- Loss of 0.37 ha of hazel dormouse *Muscardinus avellanarius* habitat (semi-natural broad-leaved woodland and woodland edge scrub)
- Disturbance to, or killing or injuring of, hazel dormouse
- Obstruction to / displacement of commuting greater horseshoe bats *Rhinolophus ferrumequinum*
- Disturbance to hibernating horseshoe bats *Rhinolophus* spp. in Potters Wood SSSI caves
- Disturbance to nesting peregrine *Falco peregrinus*
- Disturbance to other nesting birds or damage or destruction of active bird nests or eggs, killing or injuring nestlings

### 3 ECOLOGICAL MITIGATION & COMPENSATION

#### 3.1 **POTENTIAL IMPACT: Loss of 0.37 ha of semi-natural broad-leaved woodland**

##### 3.1.1 *Compensation/biodiversity enhancement – woodland extension*

To fulfil the requirements of the NERC Act 2006, twice the area of woodland habitat lost will be replaced to contribute to compensation and biodiversity enhancement. This will be achieved through on-site and off-site tree planting and through financial contribution to the South Devon Biodiversity Off-Setting Scheme.

The loss of 0.37 ha of semi-natural broad-leaved woodland on the dolerite spur will be compensated by off-site planting of 0.37 ha (50% of the NERC requirement) of native broad-leaved trees in the neighbouring Potters Wood SSSI to form a habitat continuum with existing woodland in the SSSI and other woodland surrounding Whitecleave Quarry. The contribution to the Pilot South Devon Biodiversity Off-setting Scheme will facilitate an equivalent area of tree planting in the designated off-set areas within South Devon enabling the two for one off-setting to be achieved.

#### **Location of planting area**

The proposed off-site tree planting area (Potters Wood extension) is situated within the boundary of Potters Wood SSSI and is centred on OS Grid Reference SX 736 652. The planting area is outlined in Appendix 2.

#### **Timing and Site Preparation**

To comply with dormouse mitigation and to avoid the bird nesting season, the bramble and bracken will be removed from the planting area by cutting under the terms of the dormouse mitigation licence (see section 3.2).

The bramble must be cut in the presence of an ecologist, who would undertake a hand search for potential dormouse nests, during late September/October or late April/May. Which period is chosen will depend on the timing of the planning permission which will in turn determine when a Mitigation Licence can be granted.

Habitat clearance during these two periods coincides with when dormouse is active but not breeding, thus enabling animals to passively relocate to suitable habitat nearby. If clearance takes place in spring, tree planting and establishment would be better left until the following winter. This would enable root establishment whilst ground water levels are higher. If it is assessed that there is no risk of trampling or disturbing dormouse nests then planting can proceed without constraint.



An ecologist would search for dormouse nests ahead of vegetation cutting and removal. In this situation, cutting must proceed from the field towards the woodland to enable animals to escape into nearby woodland.

The brash will then be carefully raked off and burnt or chipped immediately. Burning or chippings must occur on the planting area and avoid the neighbouring habitats.

The established ash *Fraxinus excelsior* saplings and other trees/shrubs (except for sycamore *Acer pseudoplatanus* and *Buddleja*) will be retained and incorporated into the planting plan. Sycamore and *Buddleja* must be cut and treated with herbicide similar to bramble to prevent re-growth. Bramble re-growth will be controlled annually in spring by spot treatment with suitable herbicide until the planted trees reach canopy closure stage.

The new plantings will be protected from sheep grazing by a 1.2m stock-proof fence. The stock-proof fence will be located along the hillside above the existing hedge/tree line and will connect to existing fences at either end of the planting area in order to keep the sheep in the upper field (Appendix 2). The fence will also exclude sheep from the existing woodland below the planting area thus and have the added benefit of facilitating woodland regeneration which is currently being prevented by sheep grazing.

The fence line must accommodate sheep access to a water trough lower down the hill next to Whitecleave Wood. This will necessitate incorporation of a 'dog leg' in the fence line at the northern end of the planting area (see Appendix 2).

### **Planting Stock**

The proposed planting area is surrounded by existing woodland and a semi-mature tree-line. It will incorporate a 5 m wide woodland ride running along the contour of the slope between the existing woodland edge and the new planting area in order to increase habitat structural diversity and maximise biodiversity opportunities.

Planted trees will comprise locally native broad-leaved trees and shrubs. The species and the height and form of specimens to be planted are listed in Appendix 2. Planted species will comprise hazel *Corylus avellana*, silver birch *Betula pendula*, crab apple *Malus sylvestris*, field maple *Acer campestre*, spindle *Euonymus europaeus* and wild cherry *Prunus avium*, sessile oak *Quercus patraea* and rowan *Sorbus aucuparia*. Ash tree planting has been avoided as the species is already present and it is expected that ash will readily continue to self-seed and enhance the woodland tree diversity.

## Post Planting Management

Bramble and bracken re-growth will be monitored annually during winter and appropriate herbicide control administered in April for up to five years, depending on the rate of re-growth.

Areas around tree bases should be kept clear of weeds and grass all year, but especially in the spring, when 'weeds' and grasses are at their most competitive. Herbicide or mulch treatments will be applied to reduce competition between the planted trees and grasses or herbs. An area of 1 m<sup>2</sup> around individual trees, or a 1 m strip if the trees are planted in rows, is recommended. Vegetation re-growth between rows will be strimmed or mown annually including any self-set sycamore and *Buddleja*.

Replacement trees may be required if significant losses occur soon after planting or during the establishment period. Response to the losses will be dependent on the number of trees involved and the pattern of the losses. If fewer than 10% of trees are lost, and these are scattered throughout the new wood, there is probably little cause for concern. Larger-scale losses inevitably affect the structure of the new woodland and may delay canopy closure thus would require some replanting.

### 3.1.2 *Compensatory new hedgebank*

The existing section of hedgebank, parallel to the western perimeter of the site, will be extended north and south. At its southern terminus the feature will link to Potters Wood SSSI. The bank will be planted with native broad-leaved trees and shrubs and managed as a tall, species-rich hedge/tree line primarily to support commuting or foraging bats and dormouse but is likely to benefit birds and invertebrates and enhance general site biodiversity as it matures.

The existing section of new hedge bank will be enhanced by whip and feathered tree planting to plug existing gaps in the hedge. The hedge bank will be maintained indefinitely during the operational stage. The hedge bank extensions will incorporate transplanted trees and shrubs from the woodland area to be lost where practical but will also be planted with feathered trees and whips to ensure a continuous, dense vegetation screen. Planted stock should include crab apple *Malus sylvestris*, native oak *Quercus* spp., field maple *Acer campestre*, spindle *Euonymus europaeus* and wild cherry *Prunus avium*.

To suppress weed growth and competition the bank will be covered by mulch mats and covered by bark mulch to help to retain moisture.

Tree planting during winter will ensure higher levels of soil moisture to aid tree and shrub establishment. During the first two growing seasons after its construction, the hedgebank will be watered using a trickle pipe laid along the top of the bank which will be fed by a reliable water supply.

The location of the hedge bank is shown in Appendix 3 and a cross-section drawing of this feature is provided in Appendix 4.

The hedgebank construction and tree planting will immediately follow completion of rock blasting and removal of the dolerite spur.

#### 3.1.3 *Biodiversity enhancement – wildlife ponds and bee meadow*

Two wildlife ponds of c.5000 mm diameter and c.750 mm maximum depth will be installed at the southern end of the site adjacent to Potters Wood SSSI (Appendix 3). The ponds will be lined with puddle clay and enhanced with suitable wetland plants.

The ponds will be protected during construction and operation by suitable fencing.

Flower-rich swards will be developed at the southern end of the site, close to the ponds, to provide nectaring sites for honey bees from nearby hives.

#### 3.1.4 *Biodiversity enhancement – planted wetland swale and planted bund*

A planted swale of c.300 m length (designed to develop into a vegetated wetland) will be constructed around the perimeter of the northern half of the quarry void (Appendix 5).

The swale will be lined with butyl rubber pond liner and puddle clay. It will be a maximum of 1000 mm deep at its central point and 1500 mm wide. Its profile will be tiered at 400 mm depth on either side. The tiers will increase habitat structural diversity and encourage colonisation by marginal plants thus increasing its biodiversity value. The shoreline above the upper tier will have a gradually sloping profile. The wetland will be created immediately following the completion of Construction Phase 3. A cross-section is shown in Appendix 6.

An earth bund up to 3000 mm in height and up to 3600 mm base width, depending on soil stability, will be built close to and along the quarry side of the perimeter swale (Appendix 5). A cross-section of this feature is shown in Appendix 6. A number of gaps will be left in the bund to allow access for maintenance. The bund will be planted with locally native shrubs. The exact specifications will be determined at the time of bund installation immediately after Construction Phase 3. This should be determined and agreed by Sam Gilpin Demolition Ltd in consultation with an ecologist or a landscape architect.

### 3.2 **POTENTIAL IMPACT: Loss of 0.37 ha of hazel dormouse habitat (semi-natural broad-leaved woodland and woodland edge scrub)**

#### 3.2.1 *European Protected Species Mitigation Licence*

Mitigation and compensation for dormouse, a European Protected Species (EPS), will be dictated by the terms of an EPS Mitigation Licence in respect of this species, which will allow derogations from the Conservation of Habitats and Species Regulations 2010.

Natural England grants an EPS Mitigation Licence, in part, on the basis of a detailed Delivery Document (a Method Statement) that specifies detailed mitigation and compensation and how the mitigation will be applied and managed in order to address the test of maintaining Favourable Conservation Status. Once a licence is issued, the mitigation becomes legally binding.

The full details of mitigation and compensation are to be confirmed as part of the licence application but the general principles of the likely dormouse mitigation will follow *The Dormouse Conservation Handbook* (Bright, Morris & Mitchell-Jones 2006) and recent Natural England web-based guidance on EPS licensing (internet shortcuts provided in References and Bibliography section).

#### 3.2.2 *Dormouse habitat compensation*

The loss of dormouse woodland habitat on the dolerite spur will be compensated in the medium to long-term by the tree planting described in section 3.1.

The proposed planting area within the SSSI currently comprises bramble scrub and bracken which may support dormouse. Suitable and proportionate mitigation for dormouse will be applied during site clearance in preparation for tree planting. The proposed mitigation will be incorporated into the EPS Mitigation Licence for the development.

The dormouse carrying capacity of nearby woodland will be enhanced by localised management of existing neighbouring woodland.

Installation of a stock proof fence will not only protect the planted area but will also prevent sheep entering existing woodland and therefore guard against trampling and grazing of ground flora and browsing of woodland shrubs thus facilitating woodland regeneration.

Mitigation may involve selected felling of sycamore trees will reduce competition with native shrubs and trees such as hazel and birch. This is to be confirmed during the dormouse licence preparation and will only occur if removal of suitable specimens would result in a positive net result for dormouse habitat.

Mitigation may involve selected coppicing of existing mature hazel shrubs will facilitate new, more productive mast-bearing growth and promote habitat structural diversity. This is to be confirmed during the dormouse licence preparation and will only occur if removal of suitable specimens would result in a positive net result for dormouse habitat.

Gapping-up planting of the existing mature hedgerow linking Whitecleave Wood and Potters Wood will be beneficial to facilitate dormouse dispersal between mature woodland stands.

The translocation and replanting of hazel stools removed from the dolerite spur to sites along the edges of existing woodland will be undertaken where practical to provide habitat enhancement using well-grown stock.

Management of the planted area will follow established principles (i.e. Bright & Morris 1989 & 1990; Bright, Morris & Mitchell-Jones, 2006) in order to optimise its suitability for dormouse as the new woodland develops.

### **3.3 POTENTIAL IMPACT: Disturbance to, or killing or injuring of, dormouse**

#### **3.3.1 *Dormouse translocation***

Twenty dormouse nest boxes will be installed in the dolerite spur woodland and 30 nest tubes installed in dolerite spur woodland edge scrub during 2012.

As appropriate Dormouse will be translocated from the dolerite spur woodland to neighbouring woodland during suitable translocation periods of April-May and late September-October<sup>2</sup>. Adequate translocation effort of both one spring and autumn period will be required ahead of dolerite spur woodland habitat clearance works<sup>3</sup>.

The artificial nest sites (boxes and tubes) will be adopted by dormouse and will be checked by a licensed dormouse ecologist at weekly intervals over the translocation periods. Disturbance to dormouse through handling will be minimised by translocating the nest box/tubes containing the nest and animals to neighbouring woodland sites identified in the mitigation licence. Translocated nest boxes/tubes will be replaced immediately to maintain catch effort.

#### **3.3.2 *Sensitive habitat clearance***

During woodland habitat clearance the artificial nest sites will be removed and a hand search of habitats made by licensed dormouse ecologists ahead of clearance. The method and order of clearance work is to be confirmed in

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<sup>2</sup> The suitable translocation periods refer to South West England and will be subject to suitable spring and autumn temperatures being recognised to make sure dormouse is active.

<sup>3</sup> At time of writing the dates of this mitigation cannot be specified as these are dependent on a number of factors such as the outcome and date of successful planning permission and the outcome of the vibration modelling from the trial blasts and the potential impact of this on cave hibernating bats.

discussion with the scheme arborist and will be detailed in the EPS Mitigation Licence. All habitat clearance will be undertaken under supervision of a licensed dormouse ecologist.

### **3.4 POTENTIAL IMPACT: Obstruction to / displacement of commuting greater horseshoe bats**

An important commuting route for greater horseshoe bat passes through the development site. The following mitigation is based on the commuting route described in a separate URS report (*Whitecleave Quarry Greater horseshoe bat monitoring surveys 2011*).

#### **3.4.1 *Site operating hours***

The site operating hours are to be 07.30 – 18.30 h Monday – Friday and 08.00 – 13.00 h on Saturday. The site will not operate on Sunday. It is important that these working hours are strictly applied to avoid potentially significant disturbance to commuting bats from artificial light sources.

#### **3.4.2 *Lighting mitigation plan***

Artificial lighting of the proposed facilities has been carefully designed in consultation with Natural England to avoid impacts on commuting greater horseshoe bats using the established commuting route past the proposed MRF area and adjoining access roads.

The parking lights alongside the office and MRF area will comprise Stellar 1 fittings (Kingfisher Lighting) which are high pressure sodium (SON). Three lights would be column mounted at 3 m height and very directional resulting in no direct light source towards the bat commuting route and minimal reflective illumination.

Modelling using Relux light calculation software indicates a maximum illumination of 0.56 lux at any point within a vertical plane between ground level and 5 m height along the bat commuting corridor. The illumination would be solely from ground reflected light as the luminaire points down and is directional, thus a better design than the luminaires previously proposed. The lighting plan is provided in Appendix 7.

The lighting mitigation plan specifies other lighting around the IBA facility. Compliance with the lighting specification is essential to avoid potential impacts to other species of bat which commute or forage around Whitecleave Quarry.

Once the lighting has been constructed, the engineers will test the system to evidence that it complies with the limitations as defined in the lighting mitigation plan. The subsequent report will be submitted to DCC. In addition the site management plan will detail requirements for the replacement of faulty/broken lighting to ensure that the lux values or position of the lighting is not altered.



There will be no security lighting on site.

Initial bat surveys post installation of the lighting will also monitor and log the on-site lighting conditions. Should, at any point during the monitoring it be identified that levels have been exceeded, then immediate remedial action will be taken.

#### 3.4.3 *Protection of existing habitats along the bat commuting route*

The existing trees and shrubs along the bat commuting route must be protected to preserve the integrity of the greater horseshoe bat commuting route. This will require suitable temporary fencing to be installed along the entire length of woodland edge along the northern site perimeter during the construction period. Future habitat management is described in sections 3.4.4 and 3.4.5.

#### 3.4.4 *Avoidance of physical obstructions to commuting bats*

Designated vehicle parking zones have been carefully planned to avoid any physical obstructions to greater horseshoe bats commuting past the MRF, offices and turning circle areas.

During construction, vehicles and material stock piles should not be stored along the woodland edge bat commuting route.

#### 3.4.5 *Habitat enhancement of the bat commuting route*

Greater horseshoe bat commuting opportunities will be enhanced by tree planting in three areas along the identified bat commuting route (Areas 1-3) shown in Appendix 8. The planting will create a more enclosed and sheltered environment for bats in the short to medium term and in the long-term improve canopy habitat connectivity above the access roads.

Areas 1, 2 and 3 will be planted with the specified trees and/or shrubs listed in Appendix 8.

##### **Area 1**

Area 1 will be created by planting along the base of the embankment from the MRF building to the turning circle. Construction of a 1000 mm high retaining wall/steel sheet piling along the base of the existing bank will be backfilled with soil and planted with shrubs to provide a natural screen which will further mitigate the minimal light spill from car parking lights. As the shrubs grow upwards, they will, in combination with the existing tree canopy overhang, create a bespoke commuting 'tunnel' for greater horseshoe bats.

Plantings will comprise low-growing tree and shrub species in order to extend the available woodland habitat and provide additional cover for commuting bats past the MRF area. Tree and shrub species will comprise silver birch or downy birch *Betula pubescens*, holly *Ilex aquilinum*, hazel, grey willow *Salix cinerea* and hawthorn *Crataegus monogyna*.

## Area 2

Area 2 is a bare earth bank protruding to the turning circle between two access roads. This area will be planted with taller growing tree species to enhance the tree canopy habitat over the access roads either side, providing additional cover for commuting bats where they cross the open area between the two areas of woodland.

## Area 3

Area 3 is the verge and embankment along the west side of the main access road, adjacent to Area 2. This area will also be planted with taller growing tree species that will merge with existing trees and enhance the tree canopy habitat over the access road.

### 3.4.6

#### *Future Habitat Management*

Habitat management in Areas 1-3 aims to improve habitat connectivity for commuting bats. Dead shrubs or trees should be replaced at the earliest planting window (autumn/winter period).

Areas around tree bases should be kept clear of weeds and grass. Herbicide or mulch treatments will be applied to reduce competition between the planted trees and grasses or herbs. An area of 1 m<sup>2</sup> around individual trees is recommended.

Self-set sycamore *Acer pseudoplatanus* and *Buddleja* must be cut or pulled annually to prevent competition with planted trees.

Dead tree or shrub specimens occurring soon after planting or during the five year establishment period will be replaced as required.

Overhanging vegetation or canopy growth over the access roads will receive minimal management sufficient to maintain vehicle access. Any additional management should not be undertaken without consulting a bat ecologist.

Roadside areas should be lightly trimmed as required to maintain access. Trees or shrubs should not be topped.

Any emergency works, such as to clear a fallen tree which may be blocking an access road or which may be putting the integrity or safety of site staff or a structure at risk, must be undertaken in a manner to avoid or minimise damage to surrounding vegetation.

Any cuttings should be stacked as windrows in the woodland edge on site to enhance habitat for woodland flora and fauna.



### 3.5 **POTENTIAL IMPACT: Disturbance to hibernating greater horseshoe bats and lesser horseshoe bats in Potters Wood SSSI caves and other bats in nearby roosts**

This potential impact is related to vibrations and noise caused by rock blasting. To clarify, the rock blasting process will take place in three stages. The first stage is a *blasting trial* which took place in February 2012. The second stage is a *trial blast* which would take place immediately preceding the third stage, which is *rock blasting* proper, once planning permission is granted.

#### 3.5.1 *Blasting trial and ground vibration modelling*

A blasting trial was undertaken on 15 February 2012 in full consultation with Natural England, Teignbridge District Council and Devon County Council. Vibration monitoring equipment was situated at strategic locations at varying distances from the blast site to record ground vibration. Vibration monitoring equipment was located at Potters Wood caves and the readings were used to model the likely vibration effect of rock blasting on cave hibernating bats.

Counts of hibernating bats at the caves were undertaken ahead of the blasting trial on 10 February 2012 and the results discussed with Natural England (Julien Sclater, pers. comm.<sup>4</sup>) to determine the most suitable course of action.

In the event, a small numbers of lesser horseshoe bat and greater horseshoe bat were recorded and it was agreed with Natural England that the blasting trial could go ahead on 15 February as planned.

Subsequent hibernating bat survey visits immediately prior to the blasting trial on 15 February and again on 20 February found a similar low number of bats.

The bat activity levels prior, during and post blasting trial, were analysed and the results of the hibernating bat surveys and blasting trial vibration modelling, together with any detectable affect on the hibernating bats has been considered and potential impacts discussed in a separate report URS report (*Whitecleave Quarry Redevelopment: Bat Hibernation Caves Monitoring March 2012*).

The bat hibernation cave monitoring during the blasting trials found very small numbers of lesser and greater horseshoe bats, which is in agreement with earlier bat counts at the site between 1959 and 1989. Based on these results it is not considered that the very small numbers of horseshoe bats are significant in terms of the South Hams SAC greater horseshoe bat interest. Furthermore it is considered unlikely, based on opinions expressed in available assessment reports on the effects of blasting on cave roosting bats, that the vibration level predicted to occur from the rock blasting will significantly disturb any bats present in Potters Wood caves and certainly would not be detrimental to the maintenance of favourable conservation status of the two horseshoe bat species within their natural range.

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<sup>4</sup> Telephone and email communications of 10 February 2012.

The next stage in rock blasting will be a *trial blast* which will be undertaken under licence after planning permission has been granted. The trial blast is used to effectively calibrate the accuracy of ground vibration modelling data from the blasting trials. The trial blast will occur immediately preceding the dolerite spur rock blasting. The trial blast will, in conjunction with the blasting trials data, determine the maximum weight of the charges used for rock blasting.

Based on available literature it is recommended that the peak particle velocity measurement at Potters Wood cave during the rock blasting does not exceed  $6.5 \text{ mm sec}^{-1}$ . It is therefore recommended that ground vibration monitoring is conducted simultaneously with the trial blast and throughout the rock blasting period to monitor vibration levels at the nearest cave site. This will provide instant feedback and enable the charge weight to be managed to ensure vibration levels do not exceed  $6.5 \text{ mm sec}^{-1}$ . In practice this restriction is likely to be important from mid-late November when bats are typically more likely to enter longer periods of torpor.

To comply with seasonal constraints for mitigation for a suite of protected species on site, the rock blasting to remove the dolerite spur is programmed to occur over the three month period between September and November unless it can be demonstrated that there would be no disturbance (as defined under the Habitats Regulations, 2010) to bats.

A mitigation plan will be prepared and agreed with NE and the Waste Planning Authority (WPA) (as part of the required blasting scheme) in order to make sure there will be no potential disturbance to bats in Potters Wood caves or other bat roosts. This will set out details of timing of blasts and vibration/noise control. The details from this will feed into the development of a overall wildlife mitigation timetable which covers all protected species issues and will be agreed with the WPA.

### 3.6 **POTENTIAL IMPACT: Disturbance to nesting peregrine *Falco peregrinus***

The scheme will not affect the higher cliff faces which support nest sites or roost sites of peregrine and these will be retained and protected in there current state.

#### 3.6.1 *Staff briefing*

Staff on site will be briefed and instructed to ensure that any activities beyond the normal operation of the site are evaluated to make sure these do not result in intentional or reckless disturbance to nesting peregrine should the species nest in future years. This stance will be enforced by company disciplinary action.

### 3.6.2 *Rock blasting*

The blasting of the dolerite spur must avoid the core peregrine nesting period (i.e. February-July). This includes the courtship / pre-nesting period and egg-laying period when birds are most sensitive to excessive disturbance that could deter nesting or result in abandonment of eggs.

### 3.6.3 *Monitoring*

Continued monitoring and assessment for peregrine breeding activity will be undertaken by the appointed raptor ecologist in order to inform operations and ensure that the offence of intentional or reckless disturbance to nesting birds is not committed. If an active peregrine nest site is present the raptor specialist will assess the situation and advise accordingly.

## 3.7 **POTENTIAL IMPACT: Disturbance to other nesting birds or damage or destruction of active bird nests or eggs, or killing or injuring nestlings**

### 3.7.1 *Habitat clearance*

Habitat clearance will avoid the main bird nesting season, which for the majority of species is typically between March and August. Some species, e.g. woodpigeon *Columba palumbus*, often have a more protracted nesting season and a few woodland species, e.g. mistle thrush *Turdus viscivorus*, nest from February onwards.

### 3.7.2 *Site supervision*

In order to ensure the nests of early or later nesting species will not be damaged or destroyed habitat clearance outside the main nesting season will be preceded by inspection of the habitat for active nests by an ornithologist.

These mitigation measures for nesting birds constitute reasonable effort to minimise the risk of committing an offence under the Wildlife & Countryside Act 1981 (as amended).

Mitigation works undertaken as part of a European Protected Species Licence will be supervised by the *Licensed Ecologist* or their accredited agents named on the licence.

An ecological clerk of works has already been appointed by Sam Gilpin Demolition Limited to oversee the other mitigation and monitoring set out in this document and other supporting ecological references. Green Lane Ecology is the nominated practitioner.

## **4 ECOLOGICAL MONITORING**

### **4.1 Greater horseshoe bat**

Monitoring of commuting greater horseshoe bats along the identified commuting route will be undertaken during the construction period (number of years to be agreed), for three consecutive years post construction and in years 5 and 10 post construction. A detailed monitoring programme will be developed in consultation with NE and for the written approval of the WPA prior to the commencement of development.

Monitoring will be undertaken over the full 'bat activity' year, with monitoring visits once a month between March and October. The March and October visits will be undertaken in early March and late October to coincide with the periods when there is the greatest chance of bat commuting activity overlapping with site working hours and the operation of parking lights in the MRF area. Actual illumination levels will be recorded during survey periods.

The aim of the bat monitoring is to ensure there is no adverse effect on commuting bats using the identified bat commuting route through the site.

The objectives of the monitoring are to:

- Monitor the overall number of bats using the known commuting route through the site
- Monitor the overall number of bats using the known commuting route through the site at different times of year
- Record any obvious bat avoidance of lit or other worked areas to determine any adverse impact on commuting bats and mitigate accordingly
- Identify and mitigate any other unforeseen/incidental adverse impacts on commuting bats
- Further define the micro-routing used by bats and if this changes with season
- Monitor the actual illuminance from artificial lighting along the bat commuting route to ensure it remains below 1 lux.
- Check the condition of new plantings and general habitat integrity along the bat commuting route
- Provide annual written report to Devon County Council on the results of the above objectives

The result of the bat monitoring will be reviewed to identify potential adverse effects. Should an adverse effect be identified this must be discussed with the site operator immediately so that suitable mitigation / corrective measures can be put into operation as soon as possible.

Any impacts on the greater horseshoe bat commuting route through the site will be dealt with immediately during the lifetime of the planning consent and the WPA informed.

#### **4.2 Peregrine**

Peregrine activity will continue to be monitored by a raptor ecologist to determine if birds are breeding during the construction period and post construction and to provide an indication of breeding success. This information will be relayed to Sam Gilpin Demolition Ltd to inform potential impacts and enable practical mitigation to be applied where possible such as the type and the timing of construction and operation activities on site.

#### **4.3 Monitoring Periods**

Ecological monitoring of the site will be undertaken for three consecutive years post the development. In addition bat monitoring will also be undertaken five and ten years post construction.

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