APPENDIX 9.10
Dormouse Strategy

Appendix 9.10 Dormouse Strategy

1.1 Summary

1.1.1 The results of a dormouse survey and impact assessment undertaken at a site known as Island Farm, on the outskirts of Bridgend, South Wales are described. The survey involved placing dormouse nesting tubes throughout suitable habitat within the Island Farm site, and carrying out a review of previous dormouse surveys undertaken at Island Farm and within South Wales. Island Farm is currently proposed to be developed as a sports academy and for residential and business use. An impact assessment has therefore been carried out to determine the likely impacts of the development on dormice, and recommend appropriate mitigation to alleviate any negative impacts of the development.

1.1.2 Our survey found dormice to be present throughout the site, and the site was considered to offer good quality dormouse habitat. Our findings concurred with most of the previous studies undertaken at Island Farm. An evaluation of the current development and mitigation proposals found them to be inadequate to ensure the maintenance of the dormouse population on the Island Farm site. Consequently, alternative mitigation proposals have been suggested which may increase viability of the dormouse population and facilitate the development in compliance with current protected species legislation.

1.1.3 Alternative mitigation proposals included the re-designing of the development layout, using semi-standard trees and shrubs in the replacement habitat, and the provision of dormouse nest-boxes. Where practical, the creation of a new area of dormouse habitat within arable fields opposite the site, and the use of eco-ducts to facilitate dormouse movement between Island Farm and the new habitat are suggested as the preferred mitigation proposal.

1.1.4 It is considered possible to facilitate the proposed development whilst complying with current legislation which protects dormice and their habitat, however extensive mitigation is required due to the loss of habitat and the increased levels of disturbance as a result of the development.

Purpose of Report

- To report the findings of a dormouse survey carried out at a site known as ‘Island Farm’, Bridgend, South Wales.
- To discuss the possible implications of the presence of dormice on proposals to develop the site as a Rugby Academy, residential and business uses.
- To assess the impact of the proposed development on the dormouse population on the site and consider mitigation proposals to safeguard the dormice whilst facilitating development on the site.

1.2 Introduction

1.2.1 ‘Island Farm’ is located on the A48 By-Pass Road, on the outskirts of Bridgend, South Wales. The site includes both a brownfield area in the northern half of the site, which is currently owned by Bridgend County Borough Council (BCBC), and the adjacent farmland which occupies the southern half of the site. The site comprises approximately 50 hectares in total, the brownfield area only occupies approximately 10 hectares of the site, and the farmland

covers approximately 40 hectares of the site.

1.2.2 A proposal has been made to develop the site as a rugby academy, housing, hotel and employment area by Island Farm Developments Ltd (Drawing: Overall Development Layout, dated: April 2002), and a resolution to grant planning permission was issued on 10th June 2003, subject to the applicant and landowner(s) of the site entering into a Section 106 Agreement. As a result of consultation between the local planning authority, the Countryside Council for Wales (CCW), and BCBC, CCW raised a number of issues with regard to the ecology of the site, particularly regarding dormice (Muscardinus avellanarius) and bats. Previous ecological surveys, carried out in the brownfield area of the site by the Welsh Development Agency Biodiversity Audit in 2000 and Cresswells Associates in 2001, found hazel nut shells with the characteristic tooth marks of dormice indicating they were extant on site, although surveys by Wye Valley Surveys in 2002 were inconclusive as to whether dormice continued to be extant on the site.

1.2.3 Dormice are both fully protected species, listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of The Conservation (Natural Habitats & c) Regulations 1994. Taken together, this legislation makes it illegal to:

- Intentionally or deliberately kill, injure or capture dormice.
- Deliberately disturb dormice (whether in a nest or not).
- Damage or destroy, or obstruct access to, dormouse breeding sites or resting places.
- Possess or transport a dormouse or any part of a dormouse, unless acquired legally.
- Sell, barter or exchange dormice, or parts or dormice.

1.2.4 The above legislation affords protection to both dormice and their habitat. It is an offence to damage a dormouse breeding site or place of shelter, or obstruct access to such a place, which translates to providing protection for dormouse habitat, along with protection of the animal itself. As a consequence of the above legislation, any development which removes dormouse habitat, or obstructs access to such habitat, requires licensing and mitigation in order to safeguard the conservation status of the species.

1.2.5 Licenses to allow acts which would otherwise be unlawful can be granted by English Nature (EN), CCW or Scottish Natural Heritage (SNH), for scientific, educational and conservation reasons, and may be granted by Department for the Environment (following consultation with EN/CCW/SNH) for reasons of overriding public interest. Under the Conservation (Natural Habitats & c) Regulations 1994 licenses cannot be granted unless:

- There is no satisfactory alternative, and
- The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

1.2.6 As part of the planning permission application process, Island Farm Developments instructed Wye Valley Surveys to carry out an ecological assessment of the site, including a re-survey of

the brownfield part of the site to confirm whether dormice were still extant. This survey included a search of the leaf litter for characteristically opened hazel nuts in parts of the brownfield site where hazel was fruiting. During this survey dormouse nest boxes already present on the site were checked. Both the hazel nut survey and the nest boxes were checked in February 2002, when dormice are in hibernation. Wye Valley Surveys found no evidence of dormice in the nest boxes, and found nuts with 'similarities to those opened by dormice' in the scrub and hedgerows on the boundary between the brownfield site and the farmland. They concluded there were three possible dormouse populations on site in the areas where the possible 'dormouse nuts' were found (Map 4, Island Farm Bridgend Ecological Report August 2002).

1.2.7 Based on the earlier surveys carried out by Cresswells Associates and the Welsh Development Agency Biodiversity Audit, CCW concluded that dormice remained extant on site and determined that a comprehensive mitigation strategy would be required if development on the site was to be facilitated whilst complying with legislation for the protection of dormice and other protected species. A programme of mitigation was therefore incorporated into the Ecological Report and proposals drawings (Drawing: Overall Development Layout, 24/04/02) which formed part of the Environmental Statement included with the Planning Application in October 2002. However, CCW found the surveys and dormouse mitigation proposals inadequate to ensure 'the maintenance of dormouse at a favourable conservation status in their natural range'.

1.2.8 Further dormice surveys of the brownfield land were carried out by The Vincent Wildlife Trust in September 2003, and 'good evidence' of dormice was found, and the habitat was considered to offer 'valuable feeding, nesting and hibernation sites'

1.2.9 In February 2004 CCW commissioned Michael Woods, of Michael Woods Associates to provide a report giving technical advice on dormice at Island Farm, specifically considering the impacts of the proposed development on dormice, based on data gathered by previous surveys. This report also considered the need for further surveys, and observations on whether the suggested mitigation was sufficient to safeguard the population of dormice believed to be on site. This report concluded a good population of dormice was likely to be present on site, and the mitigation proposed in Wye Valleys Surveys Ecological Report (Wye Valley Surveys, 2002) was inadequate to ensure the survival of dormice on the Island Farm site.

1.2.10 ELMAW Consulting were commissioned by Island Farm Developments in February 2004 to carry out an impact assessment on the effect of the proposed development on dormice. This included a comprehensive survey of the entire Island Farm site for the presence of dormice and mapping their distribution throughout the brownfield site and the adjacent hedgerows in the farmland part of the site. If dormice were confirmed as extant on the site, ELMAW were to consider a mitigation and compensation strategy which would facilitate development on the site whilst complying with legislation for the protection of dormice. ELMAW were commissioned to carry out all the necessary ecological works in order to enable the Section 106 Agreement to be signed.

1.2.11 This report details our initial findings from a dormouse survey carried out between May and November 2004, and provides a brief synopsis of the projected impacts of the proposed development on dormice, and the necessary improvements to the mitigation and compensation strategy for the maintenance of the dormouse population at a favourable

conservation status, as required under the Conservation (Natural Habitats & c) Regulations 1994. This report also considers the findings and recommendations made in Michael Woods Technical Advice on Dormice (Woods, 2004).

1.3 Baseline Conditions

1.3.1 Island Farm covers approximately 50 hectares of land on the outskirts of Bridgend, South Wales. The site is divided into two areas; the brownfield area covers approximately 10 hectares in the north of the site, and an area of farmland divided by several mature hedgerows lies across the southern half of the site. The brownfield area is currently owned by BCBC, whilst the farmland is owned by Mr Joseph. The site is bordered to the north by the A48 By-Pass Road, to the south by New Inn Road, to the west by Merthyr Mawr Road, and to the east by housing and a railway line.

1.3.2 Habitats present within the site include dense scrub, woodland, grassland and arable farmland. The brownfield area is dominated by dense scrub and woodland, with areas of close-cropped rabbit grazed grassland. The scrub and woodland habitats support a diverse range of species including (but not limited to) ash (Fraxinus excelsior), oak (Quercus sp.), hawthorn (Crataegus monogyna), blackthorn (Prunus spinosa), hazel (Corylus avellana), bramble (Rubus fruticosus agg.), field rose (Rosa arvensis) and field maple (Acer campestre). The brownfield area also includes areas of concrete hard-standing and bare ground, which is used for informal recreation, although there is no public right of way or official access. The brownfield part of the site also includes an old Prisoner of War (POW) Hut, on the eastern boundary of the site where it borders the housing along the A48. The POW Hut is a grade II listed building and will be retained as part of any development.

1.3.3 The farmland part of the site lies immediately adjacent to the brownfield area, and comprises nine arable fields separated by mature mixed-species hedgerows, which, together with the scrub habitat within the brownfield area, form a continuous area of habitat across the whole site. The hedgerows provide habitat connectivity between the two parts of the site, and consequently the site supports a network of continuous hedgerows and scrub habitat, with occasional isolated patches of scrub and woodland in the brownfield area which are surrounded by grassland. Two ponds lie at the centre of the farmland area, surrounded by four hedgerows, an area of rank grassland and a pile of rubble.

1.4 Methodology

Desk Study

1.4.1 A biological data search was requested of The Wildlife Trust of South and West Wales for all records of protected species within 500 metres of the Island Farm site.

1.4.2 Several scientific papers and research documents were consulted to assess the status of dormice both within the Island Farm site and across Wales, including:

- The Distribution of the Hazel Dormouse Muscardinus avellanarius in Wales (Jermyn et al, 2001);
- Island Farm, Bridgend, Technical Advice on Dormice (Woods, 2004) (which

included the results of surveys by Cresswells Associates and the and the Welsh Development Agency Biodiversity Audit) and;

- Ecological Report (Wye Valley Surveys, 2002).

1.4.3 There have been several reports and studies of the dormouse population on the Island Farm site, and the results and conclusions of each report have been researched in order to ascertain the current status of knowledge regarding dormice on the site.

1.4.4 Michael Woods' report, which was commissioned by CCW to evaluate the status of dormice on the Island Farm site and the proposed mitigation, was also considered as part of the impact assessment, and the suggestions made were considered in possible mitigation strategies for the dormouse population on site.

Dormouse Survey

1.4.5 A comprehensive dormouse survey was carried out in all suitable habitats at the site known as Island Farm, Bridgend, South Wales, between May and November 2004. The survey was carried out in accordance with guidelines published by English Nature (Chanin and Woods, 2003), and encompassed both the brownfield part of the site and the network of hedgerows in the arable farmland.

1.4.6 The survey involved placing dormouse nesting tubes in trees and shrubs at approximately 15-20 metre spacings in a linear or grid pattern throughout suitable habitat. The tubes were attached to roughly horizontal or slightly sloping branches using plastic ties. The tubes were firmly attached so they would not become dislodged in harsh weather, and were placed at a variety of heights from approximately 1 metre above the ground (in bramble) up to 2 metres high. Tubes were attached to a range of tree and shrub species, and care was taken to ensure tubes were not clearly visible from the main footpaths which would make them vulnerable to tampering. Shrubs and trees with a dense, but accessible canopy were chosen in preference to those with a more open growing habit, and most tubes were within blocks of scrub or trees and not exposed on the edge of habitat blocks. Within the hedgerows effort was made to ensure tubes were not positioned in exposed locations at the edge of the hedge, but had protection from disturbance, harsh weather and mechanical hedge cutting. The shape of the grid and the spacing of the nest tubes had to be adapted according to the shape of the habitat in the brownfield site, although the tubes were set at regular 20 metre spacings in the hedgerows. The nest tubes were standard tubes supplied by the Mammal Society, and consist of a square tube of corrugated plastic with a wooden tray which also forms the end of the tube. These tubes are readily used by dormice where tree holes and other natural nesting sites are limited or absent. Approximately 300 nesting tubes were used across the site, with approximately 150 tubes in the brownfield site and another 150 tubes in the hedgerows. All tubes were numbered and their approximate position marked on a map to aid in finding them on subsequent checks.

1.4.7 The tubes were set out throughout the site during May 2004, and checked once each month between June and September 2004 and also in November 2004 for the presence of dormice and/or dormouse nests. Dormouse nests in nest boxes or 'natural' nest holes are readily distinguishable from those of other species, however they do not construct a typical 'woven' nest with a hollow centre in the nest tubes due to the constraints of space, and therefore identifying dormouse nests in tubes relies on the dormice using materials such as honeysuckle (Lonicera periclymenum) bark and green leaves found in the trees and shrubs to

create a roughly constructed 'bed' in the tube, whereas wood mice (Apodemus sylvaticus), which readily use the tubes, tend to nest in a simple 'jumble' of brown leaves and make no attempt at a constructed nest. Typical dormouse nests in the tubes do have a 'structure' with green leaves, ivy, honeysuckle and other materials gathered from the arboreal environment constructed into a definite nest with a depression or hollow in the centre. This nest tends to remain in the tubes for some time after it has been vacated by the occupant and is therefore a useful means of confirming the presence of dormice.

1.4.8 During the checks, any dormouse nests or dormice found were recorded on the map (Figure 1, Appendix 1). This enabled the distribution of dormice across the site to be mapped.

1.4.9 To ensure adequate survey effort had been expended, we evaluated the number of tubes and length of survey time against the 'Index of the likelihood of recording Dormice' given in Chanin and Woods 2003 and shown in Table 1 below.

Table 1: Index of the likelihood of recording dormice in any one month based on the proportions of new nests recorded each month in the South West Survey

Month	Likelihood index
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2

1.4.10 The guidelines recommend a minimum of 50 tubes should be used. To calculate the minimum effort required for a reasonable likelihood of detecting the presence of dormice the following calculation is used:

- (no. tubes used/50) x (Total combined score for each month tubes were in place)
- Thus, for our survey:
- (300/50) x (2 + 2 + 5 + 7 + 2) =
- 6 x 18 = 108

1.4.11 A minimum score of 20 is considered to represent reasonable effort, and therefore in using 300 tubes during the months of June, July, August, September and November, giving a score of 108, we would consider reasonable effort has been made to determine the presence or absence of dormice on the site. It should be noted that the survey was designed purely to detect the presence or likely absence of dormice on the Island Farm site, and no population assessment was thought necessary.

1.5 Results

Dormice Survey Results

1.5.1 Dormice were confirmed as present across the Island Farm site. Dormouse nests were found in tubes in both the brownfield site and the hedgerows, with nests found throughout all habitats within Island Farm. Figure 1 shows the location of all dormouse nests in tubes, together with the month they were first recorded. In total 10 nests were found, including three in the brownfield site and seven in the hedgerows.

1.5.2 There is currently no recognised methodology for extrapolating a population from the dormouse survey, and this has not been attempted.

Desk Study Results

1.5.3 Data gathered for The Vincent Wildlife Trust (Jermyn et al, 2001) shows dormice are widely distributed across Wales, although many populations appear isolated. Dormice were found to be present at many sites in Carmarthenshire and Monmouthshire, and these vice-counties appear to have the highest densities of sites supporting dormice in Wales. They are present in all vice-counties of Wales except Anglesey, however in Flintshire, Dedighshire, Caernarvonshire and Cardiganshire, they are only recorded from a very small number (<6) of sites. In Glamorgan (in which lies Bridgend and Island Farm), dormice are recorded from 4 10 km squares and approximately 20 sites, however prior to the recent surveys carried out at the Island Farm site, the closest record was from approximately 10 kilometres away.

1.5.4 The WDA Biodiversity Audit dormouse survey carried out across the brownfield area of the Island Farm site in 2000 found ‘dormouse nut shells’ within the brownfield part of the site. A further survey carried out by Cresswells Associates in 2001 used 50 dormouse nest boxes erected throughout the brownfield site. None of the nest boxes were occupied during the survey period, however a nut search in August 2001 found dormice to be present in four areas of the brownfield site. (Woods, 2004).

1.5.5 Wye Valley Surveys (WVS) carried out a hazel nut search in January 2002 in the brownfield area. They found “about 30 nuts possibly opened by dormice”, although they concluded on further inspection and after consultation with CCW, BCBC and Gwent Wildlife Trust, that none of these nuts were actually opened by dormice.

1.5.6 The most recent survey has been carried out by David Jermyn on behalf of the Vincent Wildlife Trust in 2003. This nut survey found “good evidence” of dormice where hazel was present, and concluded the site offered a “mosaic of habitat types which support a range of different tree and shrub species, which in turn provide valuable feeding, nesting and hibernating sites” (Jermyn, 2003 In: Woods, 2004).

1.5.7 Michael Woods’ ‘Technical Advice on Dormice’ is the most recent written report on the dormice at Island Farm, although this report evaluates previous studies and current research regarding dormice, and no further studies of the dormice population at the site were undertaken for this report. This report draws several conclusions regarding the dormouse population at Island Farm and the proposed mitigation with respect to the development of the site, including:

1.5.8 Dormice are present on the Island Farm site, and are likely to be present at a density of approximately 4-5 dormice per hectare.

1.5.9 Island Farm offers a good range of shrub and tree species preferred by dormice, and the brownfield site therefore offers good dormouse habitat

1.5.10 The amount of habitat within the site is insufficient to maintain a dormouse population, and therefore they are likely to cross New Inn Road and Merthyrmawr Road and access hedges in the surrounding farmland

1.5.11 The proposals will remove the best dormouse habitat within the site (scrub within the brownfield site)

1.5.12 Remaining habitat will be subject to high levels of disturbance (from light, noise, domestic cats)

1.5.13 Removal of the hedgerows as part of the development fragments the remaining habitat.

1.5.14 The existing mitigation is inadequate to safeguard the dormouse population on the site.

1.5.15 Additional mitigation, including provision of nest boxes, planting semi-standard trees, increasing the number of eco-ducts and redesigning them, and redesigning the layout of the facilities within the site should all be considered.

1.6 Evaluation of Results

1.6.1 The dormouse survey was carried out using published methodology and covered all suitable habitats within the site. Based on the results of the survey, we would consider dormice to be extant throughout the site, as the habitat is largely continuous. Although only 10 nests were found inside the tubes, this may not indicate a low population, but may indicate that there are plenty of natural nest sites within the habitats on site. The tubes are not widely used by dormice for breeding, and they generally only make transient or loafing nests in these tubes. Therefore the tubes are unlikely to detect breeding animals during the nesting season.

1.6.2 Although there is no recognised methodology to extrapolate a population from the survey results, we would agree with Michael Wood's assessment of the population, and assume the site supports approximately four to five dormice per hectare (of habitat), which gives an expected population of 26 to 32 animals and would represent the expected carrying capacity for the site.

1.6.3 Although our survey found fewer nests in the tubes placed within the brownfield habitats than within the hedgerows, we would suggest this is likely to be due to the presence of suitable natural nest sites, as the bramble scrub provides a safe habitat for nest building, and the woodland block in the north-west of the brownfield area does contain several semi-mature and mature trees which may provide natural nest sites (in holes and cavities within the trees). We would therefore consider the brownfield area to provide the 'core' of the dormouse population's habitat.

1.6.4 The site included scrub and woodland habitat which included a wide variety of shrubs important for dormice. Using data on the tree and shrub species present on site taken from

Wye Valley Surveys Ecological Report, 11 of the 18 shrubs and trees listed as valuable for dormice in the Dormouse Conservation Handbook (Bright et al, 1996) are present on the site, and the most species-poor hedgerows contain at least three of these species. The site can therefore be considered to offer good dormouse habitat. The area of suitable habitat is approximately 6.4ha, however, this is considered insufficient for the maintenance of a sustainable dormouse population. A minimum of 20 hectares of suitable habitat is generally considered necessary for the long-term survival of a dormouse population (Bright and Morris, 1996). As the Island Farm site has been surrounded by roads, a lane and a railway line for many years, we must assume the population is sustainable and therefore it is probable that dormice are crossing New Inn Road to the south of the site and Merthyrmawr Road to the west and accessing the hedgerows in the neighbouring farmland and other habitats further afield. This concurs with Michaels Wood's opinion, as both roads are narrow and unlit at present, dormice are likely to be able to cross this short distance of open ground. There are also possibly one or two points where overhanging trees may currently provide a degree of arboreal connectivity across Merthyrmawr Road.

1.6.5 The brownfield site can, at present, be considered good habitat, however the areas of dense scrub are likely to become less optimal as they mature and a closed canopy forms, reducing light-levels under the canopy and thereby reducing the fruit and flower production of the shrubs. Although the maturing scrub will eventually become less optimal woodland habitat, the open grassland habitat will succeed to young scrub, replacing that lost in areas of mature scrub.

1.6.6 The results of our comprehensive survey of the site support Michael Woods comment that dormice may use the tubes more during the autumn, particularly in September and October (see Figure 1), as sub-adult dormice disperse from the brownfield site (likely to be the 'core' habitat) along the hedgerows within the farmland, and away from their natal territory.

1.6.7 In surveying all the hedgerows, we can confirm bramble is present in almost all hedgerows within the farmland, as suggested by Michael Woods. This is likely to increase the value of the hedgerow habitat for dormice, and possibly allows them to survive in these hedgerows at greater densities than would otherwise be the case, as bramble has been shown to be a key species in dormouse habitat (Eden and Eden, 1999), providing a variety of food throughout the year in the form of flowers and fruit, and also a safe place for nesting.

1.7 Impact Assessment

Current Proposals

1.7.1 Current proposals (shown on Drawing Overall Development Layout dated 24/04/02) include placing the rugby academy, athletics facility, business park, part of the housing, and the public open-space in the farmland part of the site. This will entail removing all internal hedgerows, whilst maintaining those on the boundary of the site and on the boundary between the farmland and the brownfield area.

1.7.2 Further housing, a hotel, a roundabout and connecting roads are proposed for the brownfield area of the site. A local road is proposed to link the housing in the north of the site to the facilities in the south, which will cut through the boundary scrub and hedgerows. The proposals will involve removing much of the internal scrub and woodland within the brownfield site, with scrub and hedgerows being retained or planted around the boundary of the site and

along the proposed roads.

1.7.3 The proposals also include areas of enhanced landscaping and planting of scrub and hedgerows to replace the dormouse habitat which will be removed. Principle areas for enhanced landscaping and planting of tree and shrub species preferred by dormice include the area around the WRU Academy and associated sports pitches and around the boundary of the site. Three 'eco-ducts' are proposed to allow dormice to cross some roads and reduce the level of fragmentation within the site.

Impacts of Current Proposals

1.7.4 Based on Drawing: Overall Development Layout, we have calculated that approximately 4.1 hectares of habitat will be removed to facilitate the development, with 3.5 hectares being removed from the brownfield site, and 0.6 hectares of hedges (taking an average hedge width of 2 metres) being removed from the farmland area of the site. At present the site includes approximately 6.4 hectares of dormouse habitat, including 5.5 hectares in the brownfield area and approximately 1 hectare of hedgerows in the farmland area. The proposed development will remove approximately 64% of this habitat.

1.7.5 As recognised by Michael Woods in 'Technical advice on Dormice', the brownfield site currently offers good habitat for dormice, comprising a range of tree and shrub species, which are unmanaged and largely un-shaded, and are therefore likely to produce large quantities of flowers and fruit, providing dormouse food throughout the year. The brownfield site also contains large areas of bramble scrub, which has been recognised as a key food plant for dormice which also offers a safe nesting environment (Eden and Eden, 1999).

1.7.6 We would therefore agree with comments in Michael Woods report which stated the clearance of the bramble and other scrub from within the brownfield area will remove the best dormouse habitat within the site. Recent studies have shown bramble to be one of the most important species for dormice, and although the report by Wye Valley Surveys placed much emphasis on the lack of fruiting hazel within the site, hazel is no longer considered to be an essential component of good dormouse habitat (Eden and Eden, 1999), and dormice are able to survive in many areas where hazel is absent or never produces mast, providing other food sources, particularly bramble, are available (Eden and Eden, 1999).

1.7.7 The hedges within the farmland area are flailed regularly, and therefore they are unlikely to produce significant amounts of flowers and fruit and their value as a food source for dormice is likely to be limited, although the widespread presence of bramble in the hedgerows does improve their value to dormice. The hedges are likely to provide suitable nesting and commuting routes, as evident from our survey and supported by recent research (Chanin and Woods, 2003) which found dormice in very small, flailed hedgerows, however the hedgerows main value is as a commuting and dispersal habitat for young adults, rather than providing the core breeding habitat.

1.7.8 The surveys found seven nests in the tubes within the farmland hedges, distributed across all areas of the farmland. Our findings confirm the hedges are being used at present and are likely to be important for sub-adult dispersal during the autumn (see Evaluation of Results). This is indicated by the increased number of nests found in the hedges during August and September (two and three nests respectively). A number of dormouse tubes were damaged between the September and November checks by hedge flailing operations, and therefore the

reduced number of nests found during November may reflect this in the small number of nests found in the hedges during November. The results show the hedgerows are clearly important to the dormouse population, and we would therefore consider the loss of these hedgerows to have an adverse impact on the dormice, although of a lesser magnitude than the loss of the core brownfield habitats.

1.7.9 Based on the Overall Development Layout Drawing we have calculated that approximately 4.93 hectares of habitat is proposed to be created to replace the (approximately) 4.1 hectares removed as a result of the development. This would suggest that there will be no net loss of dormouse habitat. However, not all of the proposed new habitat will be suitable for dormice. Approximately 1.6 hectares of the proposed habitat will be unsuitable due to the close proximity of the flood-lit sports pitches and a further 0.5 hectares will be isolated from the rest of the habitat by roads linking the Business Park and housing, and will therefore be unsuitable for dormice. It is not known, at present, whether the street lighting along the local roads will render the adjacent scrub or hedgerows unsuitable, but it is a possibility. Discounting the unsuitable created habitat, this would result in only 2.83 hectares of suitable habitat being created in compensation for the 4.1 hectares which will be removed, which will be insufficient in terms of safeguarding the dormouse population on the site.

1.7.10 It may be possible, however, to plant-up the proposed area of public open space with scrub species preferentially used by dormice, which would produce a further 1.4 hectares of compensatory habitat. This would result in 4.25 hectares of habitat being created to compensate for the loss of 4.1 hectares of habitat.

1.7.11 A significant amount of habitat is proposed to be removed as part of the development, and this amount of habitat removal will unavoidably result in some level of fragmentation of the remaining habitat (as quantified above). The scrub/hedgerow habitat being retained or planted in the north-east corner of the site (around the Prisoner of War Hut and adjacent field), is isolated from all other habitats within the site by proposed roads, and habitats retained or planted within the north-eastern part of the proposed business park are also isolated from other habitats within the site by a proposed road.

1.7.12 The remaining habitat, including that proposed to be planted as part of the development, does retain a degree of connectivity around the boundary of the site, although dormice present in hedgerows in the south-east corner of the site would have to travel further, around the site perimeter to reach potential feeding grounds or habitats in the brownfield part of the site. The distribution of habitat around the perimeter of the site may cause reduced encounters between individuals for mating, leading to reduced gene flow within the population, and a reduction in the availability of a diverse range of food sources within travelling distance of the nest. Both of these factors could result in a decline in the dormouse population.

1.7.13 Although fragmentation is likely to be important in the decline of dormice (and many other species), recent studies and anecdotal evidence suggests dormice can and will cross open areas to reach habitats further afield. For example in Germany dormice have been recorded making journeys of 250 metres across open fields to reach isolated copses (Morris and Morris, 2004). Although no records exist for dormice crossing such large distances in Britain, it seems likely they are able to cross small gaps in hedgerows or between woodland and hedgerows. However, there is no evidence of dormice crossing well-lit roads or large expanses of open ground such as car parks, and movement of this species around the proposed development is therefore likely to be restricted to inter-connected habitats.

1.7.14 Three 'eco-ducts' are currently proposed to link fragmented habitats within the site. Wye Valley Surveys have recommended the use of iron arch structures, planted with climbing plants to encourage dormice to use them. We support Michael Woods comment that there is no evidence for the success of these structures in facilitating dormouse movement, and alternatives should be researched and implemented (see 9.0 Mitigation).

1.7.15 Both CCW and Michael Woods have raised the issue of potentially increased levels of disturbance to dormice resulting from the close proximity of housing, business and sports facilities, and of construction works. Although we do not disagree that the proposed development will inevitably result in increased levels of disturbance due to factors such as increased lighting, noise and the presence of domestic cats, the reference given in Michael Woods report to support this assertion does not provide any evidence on the specific effects of disturbance on dormice. However, the development will certainly result in the 'urbanisation' of the site including increased light, noise and predation, and we agree this is likely to have a significant negative, if currently unquantified, effect on the dormouse population, over and above the impacts of habitat loss and fragmentation. The housing development will include street lighting, home security lights, and light from the interior of houses, and the WRU Academy and Athletics facility will probably include floodlit areas for use at night. The increased lighting may be particularly disturbing to a nocturnal animal such as the dormouse, and therefore a significant part of the proposed additional/enhanced landscaping will be unsuitable for dormice due to the impacts of the floodlit sports pitches and academy.

1.7.16 The proposed development is also likely to result in increased noise levels across the whole site, although the noise levels will vary according to the time of day, with activity at the Business Park likely to be minimal during the night when dormice are active.

1.7.17 We concur with Michael Woods' report on the likely impact of domestic cats on dormice, particularly in habitats close to the proposed housing areas. As stated in Michael Woods report, cats have been found to kill a disproportionate number of dormice in relation to their estimated population (Woods et al, 2003). The same study also found 91% of domestic cats brought home at least one prey item between April and August 1997, with an average number of prey items brought home of 11.3. Rodentia (rodents) was the most common order of prey animal for domestic cats, and therefore the increased numbers of domestic cats as a result of the housing development are likely to have a significant adverse effect on the dormouse population at the Island Farm site.

Evaluation of Impacts

1.7.18 The current proposals for mitigating the effects of the proposed development focus on providing additional planting and landscaping around the site, particularly surrounding the proposed athletics facility and sports pitches. Much of the additional planting is proposed for the boundary of the site, augmenting existing habitat which is being retained, with some planting along the sides of roads. However, much of this planting will be unsuitable, and the amount of suitable habitat created will be minimal, even if the public open space is planted-up, as we would recommend as part of any proposals for the site.

1.7.19 This proposed mitigation would be considered the last option in terms of priority using published guidelines for mitigating the impacts of development (paragraph …) as it provides compensation for the proposed impacts, rather than taking any steps to avoid the impacts in the first instance. The proposed compensation also does not result in a 'like-for-like'

replacement of habitat, as the additional landscaping will be using young trees and shrubs, which will not produce flowers and/or fruit for several years. The new plantings will also take time to provide the inter-connected arboreal habitat important for dormice, and will be too immature to provide the degree of cover and protection from predators and the elements that a mature, dense block of scrub or hedgerow provides. Although, theoretically, it would be possible to plant the compensatory habitat in advance of the proposed development, and allow time for it to mature before removing the existing habitat, this is unlikely to be reasonable in terms of implementing any planning permission within a reasonable time-scale.

1.7.20 The impacts of disturbance, fragmentation and increased predation may create significant adverse impacts on the dormouse population in addition to those caused by habitat loss, and therefore enhanced compensatory measures and extensive additional mitigation will be required, rather than a basic replacement of habitat by area, as is currently proposed. It may be potentially difficult to ensure replacement and retained habitat is managed for the benefit of dormice, as it will have to function as part of the landscaping scheme for the housing estate, business park, hotel and sports academy, rather than purely as good quality dormouse habitat. Therefore, the habitat provided within the site may become unsuitable for dormice, resulting in the decline of the dormouse population on the site.

1.7.21 We have concluded that the proposed compensatory plantings and mitigation proposals are inadequate to ensure the maintenance of the dormouse population on the site at a favourable conservation status, and they are potentially likely to result in the decline and possible extinction of the species from the Island Farm site. This concurs with Michael Woods' opinion of the proposed mitigation. Therefore we have considered alternative mitigation proposals which may facilitate the development without causing the decline of the dormouse population on the site.

1.8 Mitigation and Compensation

1.8.1 If the proposed development of Island Farm is permitted, extensive mitigation and compensation will be required to adequately safeguard the dormouse population on site. Published guidelines (Treweek, 1999 and DETR, 1995), recommend the following approaches to mitigation should be implemented sequentially, with avoidance measures assuming priority (Canter, 1996 in Treweek, 1999):

1.8.2 Avoiding the impact altogether, by desisting from a certain action or parts of an action, e.g. by locating the main development away from areas of high ecological interest.

1.8.3 Minimising the impact by limiting the degree or magnitude of an action, e.g. modifying the design of a development to preserve 'wildlife corridors' between habitats which would otherwise be separated by the development;

1.8.4 Rectifying impacts through repair, reinstatement or restoration of the affected ecosystem;

1.8.5 Compensating for the impact by replacing or providing substitute resources or environments, e.g. creation of new habitats to replace those which have been lost, often on a different site.

1.8.6 Although the published guidelines suggest the first option for any mitigation programme should be to avoid the negative impacts of the development, this will not be possible at the Island Farm site as the scale of the development necessitates removal of at least some

dormouse habitat. Therefore, we have attempted to minimise, where possible, the negative impacts and to rectify any remaining negative impacts through restoration of habitat. We have also considered a more comprehensive compensation proposal, if proposals to minimise and rectify the predicted impacts are unsuitable.

Alternative Mitigation Proposals

Option 1:

1.8.7 Current development layout, with supplementary feeding, nest-box provision, use of semi-standards in replacement habitat, revised eco-ducts across most roads, potential for hedgerow retention (as suggested in Michael Woods report).

1.8.8 A potential problem with the current proposals is the lack of foraging habitat whilst the replacement habitat matures. This potential negative impact could be mitigated by the provision of supplementary food during the year(s) before the replacement habitat provides sufficient natural food. This would need to be provided in specialist feeders to prevent birds and squirrels accessing the food. The feeders would require regular maintenance and 'topping-up' between April and October/November for a minimum of one year following habitat removal, and possibly for up to five years, depending on the growth of the compensatory habitat and the size and density of the replacement planting.

1.8.9 Michael Woods recommends using nest boxes for monitoring the dormouse population, as these can help sustain or increase the dormouse population (Bright, Morris and Mitchell-Jones, 1996). We would support this, as lack of nest sites may be a limiting factor in sustaining populations (Bright, Morris and Mitchell-Jones, 1996). This should be applied to any mitigation programme adopted.

1.8.10 We agree with Michael Woods in that for the mitigation to successfully replace the lost habitat within a reasonable time-period, the use of semi-standard trees and shrubs is highly recommended. Planting young trees and shrubs ('whips') will result in a long delay (up to ten years) before adequate foraging and sheltering habitat is available for dormice to use, and semi-standards would provide alternative habitat much more rapidly (within one or two years potentially).

1.8.11 An alternative may be to transplant the existing mature habitat into the proposed areas for new habitat. This will involve physically digging-up the existing hedgerow and brownfield shrubs and moving them to prepared holes dug in the 'compensation area(s)' of the site. This would usually be done by coppicing the shrubs and trees prior to moving them, however this would be counter-productive in this case, as coppiced shrubs may take many years to produce flowers and fruit (10 to 15 years in the case of hazel). Transplanting the existing habitat, possibly with some additional planting of certain species, e.g. honeysuckle, should provide a usable dormouse habitat almost instantly, certainly within one year, although the habitat should be monitored to ensure adequate flowering and fruiting prior to removal of existing habitat. Although the most rapid in terms of habitat establishment, this method will require specific horticultural expertise and experienced, knowledgeable machine operators with experience of this type of work. It will be the most time consuming and labour intensive method and consequently the most expensive. This method will enable the movement of large clumps of bramble (a key species) into the new habitat areas, where planting of small bramble plants will take many years to establish.

1.8.12 We would agree with Michael Woods' suggestion to increase the number of eco-ducts across roads. This will reduce the fragmentation of the habitat caused by the removal of shrubs and trees within the site. We would recommend planting mature standard trees either side of the road at a road safety chicane, and tying the branches so they form a 'bridge' across the road which will quickly become suitable for dormice to use. This solution seems the most appropriate on the small local roads proposed for the site. In addition to the eco-ducts proposed for within the site, we would suggest these structures are placed at one or two points along New Inn Road, to facilitate the movement of dormice into hedgerows further afield as dormice are almost certainly crossing the Merthyrmawr Road to the west of the site, and may also be crossing New Inn Road. We would agree that lighting around such eco-ducts should be minimal and at low level to ensure street lighting does not preclude dormice using the features.

1.8.13 One of the suggestions for improving the mitigation in Michael Woods report is to retain some of the hedgerows in the development of the site. Although this would be technically possible, in terms of the area covered by the individual sports pitches, it is unlikely to be practical or beneficial. The sports pitches are likely to be flood-lit, and the presence of the sports pitches car-parks and associated facilities within the existing fields would make the hedgerows unsuitable due to the flood-lighting. Retaining the hedgerows will require many gaps to be created for access roads, and many more 'eco-ducts', and the complete re-designing of the development layout. We consider the costs of re-designing the layout to retain the existing hedgerows is not worthwhile as the hedges will be unsuitable for dormice due to disturbance, flood-lighting and street lighting and the hedgerows are not the 'core' habitat of dormice on the site and account for a relatively small proportion of the habitat being lost by the development.

1.8.14 One potential disadvantage of option 1 is that it does not increase the amount of suitable habitat being provided in compensation for that being removed. In order to increase the availability of suitable dormouse habitat within the site we would suggest mitigation measures are enacted to reduce the impact of flood-lighting on the habitat close to the sports pitches and academy. Although the sports pitches and academy will require flood-lighting to enable them to be used to full benefit, it may be possible to restrict the use and timing of any flood-lights to cause minimal adverse impact on dormice. We would suggest flood-lights should be turned off after 11pm, to allow dormice the rest of the night-time to feed and forage. The car-parks should not be flood-lit, but low-level, softer lighting would be beneficial. The car-park lighting could also be turned off after midnight and the car-parks gated to prevent access after this time. This would enable the proposed enhanced habitat around the sports academy and pitches to provide suitable dormouse habitat, with reduced levels of disturbance when dormice are active. Ideally the sports pitches close to created dormouse habitat should not be flood-lit or used at night. This applies specifically to the pitch closest to the public open space.

1.8.15 Additionally, as suggested by Michael Woods, the streetlights throughout the rest of the site should be turned off during the early hours of the morning to enable the habitats planted alongside these roads to be used for foraging activities.

1.8.16 If this mitigation is enacted, up to 4.4 hectares of replacement habitat could be provided, to replace the (approximately) 4.1 hectares lost as a result of the development. This amount of replacement habitat would be considered an absolute minimum, and possibly insufficient without further enhancements) as it will be provided in an urbanised area, with increased

levels of disturbance and predation.

1.8.17 We would also recommend that in addition to the changes to lighting arrangements, the public open space is planted-up with semi-standard trees and shrubs, and the hedgerows on the other side of New Inn Road are left to grow to a minimum of 4 metres high and wide, with an eco-duct linking the public open space habitat with the hedges opposite. Connectivity of habitats along the railway line should also be retained. The railway embankment includes a significant area of suitable dormouse habitat, which is fragmented in the current proposals, and suitable dormouse habitat should be retained along the length of the boundary between the railway embankment and the Island Farm site. This will also further increase the area of replacement habitat. The habitat within the railway embankment is currently dominated by blackthorn scrub, and ideally this habitat would be planted-up with a diverse range of species, to increase the value of this area for dormice.

Option 2:

1.8.18 Redesign development layout, placing business park within the brownfield area, and housing in the farmland area, retaining some hedgerows. Keep the sports facilities as shown on the current drawing, enhance hedgerows on opposite side of roads, plant-up public open space (suggestions put forward by Michael Woods).

1.8.19 Michael Woods has suggested moving the proposed housing into the business park area and developing the brownfield site as the business park and hotel. The business park and hotel could be designed to retain up to 3.3 hectares of the existing habitat within the brownfield site minimising the loss of dormouse habitat, as these facilities require less area than the proposed housing. Ideally this design could allow the best areas of habitat, including blocks of bramble scrub, to be retained within the site. As in the existing proposals, the mature hedgerows and scrub between the brownfield site and farmland should be retained to facilitate connectivity between the two areas of the site. This option is likely to result in reduced levels of disturbance to the existing and replacement dormouse habitat. As suggested by Michael Woods, the re-positioning of the business park into the brownfield site will result in less night-time disturbance to good quality dormouse habitat, and will retain more of this habitat than the current proposals.

1.8.20 We would further suggest the housing (which would now be entirely in the northern part of the farmland) be re-designed to incorporate hedges 1, 5, 9, 7 and 11 (see Figure 2), which incorporates the development into the northernmost fields (see Figure 2) of the farmland, we estimate with no loss in the number of houses built. Dormice have been confirmed as extant in these hedgerows, and this proposal would retain approximately 600 metres (0.12ha) of hedgerow and improve connectivity within the site. The hedges surrounding the housing should be widened to a minimum of five metres (plus one metre each side for maintenance), and allowed to grow to a minimum height of 4 metres, creating good hedgerow habitat for dormice. Enhancing the existing hedge network is likely to be more beneficial in the short term than creating entirely new habitat areas, and is likely to be rapidly colonised once suitable. Additionally, we would recommend the connectivity of habitat along the boundary between the railway embankment and the site is retained and enhanced by planting with a range of shrub species preferred by dormice, and not fragmented as in the current proposals.

1.8.21 This option will still necessitate the removal of 0.48ha of hedgerows in the creation of the sports facilities, and 2.2ha of habitat from the brownfield area in the development of the

business park. Therefore a minimum of 2.7ha of replacement habitat will be required to compensate for the loss of this habitat.

1.8.22 The replacement habitat should be planted away from areas of housing and flood-lit sports pitches, and should connect to existing habitat. The proposed public open space could be planted with the replacement habitat, providing 1.4 ha of compensatory habitat, with a further 1.3 ha of compensatory habitat provided by enhancing habitat to be retained as part of the development.

1.8.23 Although it is likely that an equal area of replacement habitat could be provided within the Island Farm site to replace that lost as part of the development, additional habitat is required to compensate for the increased levels of disturbance and predation caused by the development. One potential way of providing this would be to change the management of the hedgerows on the opposite side of New Inn Road, allowing these to grow-up and widen to provide additional dormice habitat off-site. A suitable eco-duct would be essential to facilitate access across New Inn Road, and should be included in any mitigation programme. As stated in paragraph 8.21, we would not consider it sufficient mitigation to simply replace the area of habitat removed by the development with an equal area of new habitat within the site. The effects of urbanisation on the dormouse habitat are likely to increase the levels of disturbance due to lighting, noise and predation by domestic cats, therefore the replacement habitat will not be of equal value or quality to that which it replaces.

1.8.24 In order to further mitigate the impacts of the development, we would advocate the restrictions on flood-lighting described in Option 1. Wherever possible, the impacts of the flood-lighting should be minimised by ensuring minimal spillage beyond the sports pitches and minimising the use of lighting between midnight and dawn.

1.8.25 We agree with the other suggestions in Michael Wood's report such as careful use of street lighting and home security lighting, and fencing off dormouse habitat from construction work to prevent inadvertent damage to habitat and the timing of habitat removal, which should form part of all mitigation and development proposals.

1.8.26 This suggestion attempts to minimise the impacts of the development, whilst providing compensation for the loss of some habitat and therefore accords with the published mitigation guidelines to a greater degree than the current proposal.

Option 3:

1.8.27 Re-create suitable habitat off-site to compensate for the loss of habitat as a result of current proposals. Continue to develop the site as proposed in Drawing: Overall Development Layout, with the addition of habitat creation within the public open space.

1.8.28 The third alternative mitigation option is to create a block, or several interconnected blocks, of dormouse habitat in the field opposite the site across New Inn Road. Dormice are likely to already be crossing the road to reach the hedgerows around this field, and it may be possible to create a new block of scrub and woodland within this field to replace the habitat lost as part of the development.

1.8.29 Although there is potential to re-create suitable dormouse habitat within the Island Farm site, this may not be ideal from several viewpoints.

1.8.30 Retaining the habitat on site is likely to result in much of the remaining habitat being subject to disturbance from noise and lights and the dormouse population being subject to predation by domestic cats. The impact on the dormouse population from disturbance and predation is difficult to quantify accurately in advance of the development, however, the urbanisation of the site is likely to be detrimental. It may be potentially difficult to ensure replacement and retained habitat is managed for the benefit of dormice, as it will have to function as part of the landscaping scheme for the housing estate, business park, hotel and sports academy, rather than purely as good quality dormouse habitat. Therefore, it may be preferable to create a block of undisturbed habitat off-site but linked to the existing habitat by eco-ducts, rather than create additional habitat on site which may become unsuitable for dormice, resulting in the decline of the dormouse population on the site.

1.8.31 As part of this proposal, a greater investment may be required in building fully functional eco-ducts, either using mature trees or building a small bridge across the road and planting it with shrubs to encourage dormice to use it.

1.8.32 This proposal would, as for other options, require the creation of significant areas of dormouse habitat, and we would recommend transplanting the existing trees and shrubs from areas where they are to be removed. This will ensure the quickest establishment of fruiting dormouse habitat and enable the development to proceed at a quicker pace. Alternatively the new habitat can be created using semi-standards (as proposed by Michael Woods), planted at high densities to give a rapid dense thicket of habitat, which will also produce usable dormouse habitat within two years of planting.

1.8.33 Despite general guidance which suggests the creation of habitat off-site is a last resort, we would support the creation of habitat off-site as a preferred solution to mitigating the impacts of the proposed development. The site-specific circumstances determine that on-site habitat creation and retention may not be ideal in safe-guarding the dormouse population in the long-term, and an area of undisturbed, continuous habitat is likely to be of greater benefit to dormice than fragmented, disturbed, small blocks of habitat within the site. Habitat off-site is also unlikely to suffer from damage during construction and disturbance post-development. It will also be easier to manage for the benefit of dormice, as there will be no pressure from other users for neat and tidy appearance or other inappropriate management.

1.8.34 As for all other mitigation options, including the current development layout, we would recommend the public open space is planted-up with suitable scrub or woodland habitat for dormice. An eco-duct could then link this habitat to the newly created block of habitat across New Inn Road. Additionally, we would also recommend the habitat along the railway embankment is enhanced by planting a diverse mix of species within this area, further increasing the amount of habitat provided off-site.

1.8.35 This option has the advantage of not requiring the re-designing of any of the proposed development, as compensation is being provided off-site and in the designated area of public open space. However, any of the suggestions for mitigation put forward in other options could be adopted to increase the value of the proposals to dormice and other wildlife, and we would recommend that all opportunities to increase the value of the development to dormice and wildlife should be taken.

Post-Development Management

1.8.36 As part of any mitigation programme a long-term management and monitoring agreement is required to ensure the habitat remains suitable and intact and to ensure the favourable conservation status of the dormouse population on the site.

1.8.37 A management plan should be produced by qualified consultant ecologists covering all habitats within the site, and any created off-site. The management plan should include detailed prescriptions for appropriate management of all habitats, together with a time-scale for implementation of all management and necessary remedial actions if the replacement habitat fails to flourish or is damaged by vandalism or fails for other unforeseeable reasons. The management plan should detail the organisations responsible for managing and implementing all stages of the management plan, together with those responsible for funding such work.

1.8.38 Similar prescriptions will be required for the dormouse population, to include a monitoring programme using dormouse nest-boxes throughout suitable habitat. The nest-boxes should be checked by a licensed dormouse ecologist a minimum of three times annually for a minimum of five years following completion of the development. Nest-boxes should be checked throughout the dormouse's active season, including one check during the autumn and one in the spring.

1.9 Summary Conclusion

1.9.1 In conclusion, we consider it is possible to facilitate the development of the Island Farm site whilst complying with current legislation which affords protection to dormice and their habitat. The proposed development will result in the loss of a significant amount of good dormouse habitat, however, by the careful design and implementation of a detailed, extensive mitigation programme, it is possible to provide compensatory dormouse habitat and ensure the development does not result in an adverse effect on the conservation status of dormice on the site, as required by law.

1.9.2 Current design proposals for Island Farm do provide some replacement habitat for dormice within the site, however the proposals do not represent a replacement of the same quality of habitat as will be lost. Replacement habitat will be fragmented and subject to high levels of disturbance from the close proximity of the housing, sporting and business facilities, compared with the relatively undisturbed habitat which exists at present. Consequently, we would consider the current proposals inadequate to ensure the maintenance of the conservation status of the dormice on the Island Farm site.

1.9.3 In order to facilitate the development, three alternative mitigation options have been described, based on the current proposals, with additional mitigation for dormice.

1.9.4 Option 1 is very similar to the current proposals, and does not provide any additional habitat, but does include supplementary feeding and nest-box provision to help support the dormice on site. This option provides additional support for the dormice in the short-term following the removal of habitat, however it does not remediate the impacts of increased disturbance and fragmentation of the habitat, and therefore may not ensure the long-term survival of dormice on the Island Farm site. This would not be a preferred option in terms of maintaining the

dormouse population.

1.9.5 Option 2 involves redesigning the layout of the development, placing the business park in the brownfield area and moving the housing into the northern fields of the farmland. Suggestions for the regulation of light levels within the vicinity of the sports facilities are also put forward. This option reduces the levels of disturbance to habitats within the brownfield area and increases the area of habitat retained within the site. This option has significant benefits over, and above Option 1, and results in a greater amount of dormouse habitat being present on site and reduced levels of disturbance.

1.9.6 Option 3 would be the preferred option in terms of ensuring the maintenance of the dormouse population. Option 3 involves the creation of a new block of dormouse habitat in the fields opposite the Island Farm site, together with the mitigation currently proposed (Drawing Overall Development Layout). The creation of a new block of scrub and woodland, linked by eco-ducts to the Island Farm site, would have several benefits. Firstly, the layout of the development could remain unchanged, with no re-designing required. Secondly, an area of quality dormouse habitat could be provided and managed specifically for the dormice. This option minimises the effects of the urbanisation and increases the amount of good quality habitat provided to compensate for that lost by the development. This option would be our recommended proposal, if it were considered practical.

1.10 References

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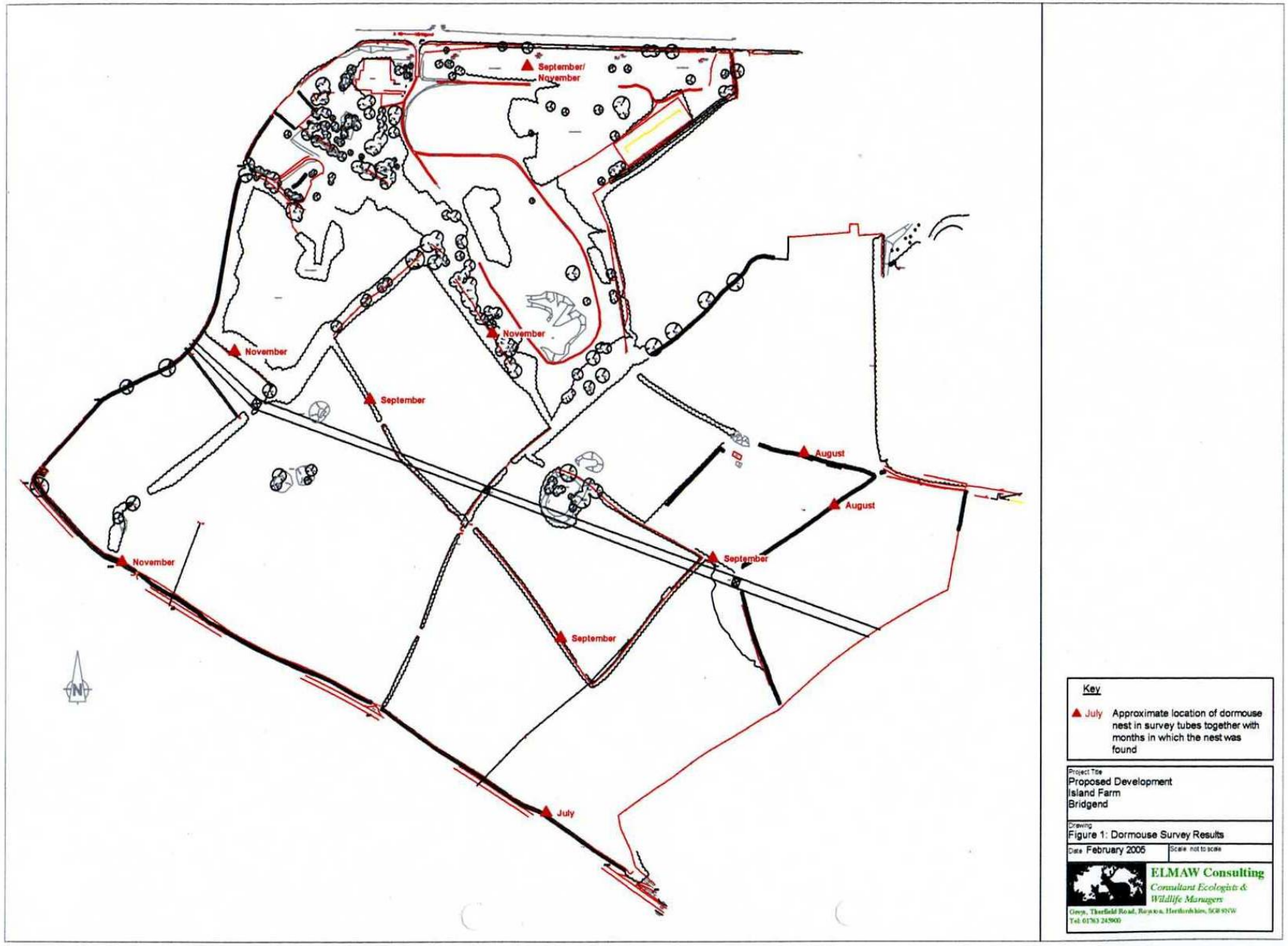
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July Approximate location of dormouse nest in survey tubes together with months in which the nest was found
Project Title
Proposed Development
Island Farm
Bridgend
Drawing
Figure 1: Dormouse Survey Results
Date February 2005
Scale not to scale
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