APPENDIX 13.3
FAUNA SURVEY METHODOLOGIES

Mammal Surveys

All surveys were carried out by D. Clarke, an experienced surveyor, and assistants Jane Sedgeley (ecologist) and Royston Hoddinott (bat worker). D. Clarke has worked on small mammals for 20 years, including his own Dormouse species recovery programme, which has been running for 12 years. He holds an English Nature bat ringing, survey licence (No. 19990204) and dormouse handling survey licence (No. 20000657).

Animal signs such as scats, spraint (faeces), footprints and fur were identified *in situ* (Bang & Dahlstrom 1974; Lawrence & Brown 1967), but otter spraints were removed from the site for confirmation of identification. Relevant findings were recorded on a detailed map and where appropriate locations identified precisely with a GPS system. Although the survey was primarily for badgers, otters, water voles, dormice and bats, any other wildlife of interest was also recorded.

Methodology for Badger Survey

Surveys for evidence of badger activity within the survey area took place on the 26th, 28th & 29th September 2000. Surveys were carried out according to recommended guidelines (Harris *et al* 1989; Macdonald *et al* 1998). The whole site was carefully investigated on foot, with particular attention paid to hedgerows, wooded areas, banks and elevated ground. Searches were made primarily for setts, well-used badger paths (clearly marked pathways through fields and vegetation, paths pushed/dug through boundaries), badger hair caught on hedges and fences (often where a badger path passes through vegetation or a fence) and latrines (shallowly dug dung-pits, often concentrated on territorial boundaries). If setts were found, the number of holes were recorded as well as any signs of activity.

During the additional botanical survey in July 2001, a check was made to ascertain if there was any change in the uses of the setts identified during the September 2001 survey.

Methodology for Otter and Water Vole Surveys

Surveys were undertaken on 26th & 28th September 2000 to ascertain whether there was evidence of otter and water vole activity were present either along the banks of the River Clyst in the vicinity of the proposed development or the surrounding habitat. Surveys were carried out in accordance with guidance provided by National Rivers Authority (1993), Royal Society for Protection of Birds, National Rivers Authority and Royal Society for Nature Conservation (1994), Macdonald *et al* (1998), and Strachan (1998). Visual survey of the river and its banks, as well as drainage ditches and any significant bodies of water were carried out on foot, allowing a thorough examination of the habitat. Banks were inspected from both sides as well as from the centre of the river, where the water depth allowed. Close-focusing binoculars were used to examine sections of bank where access was not

possible. Habitat within 50m to the western bank of the River Clyst (outside the proposed development area) was also surveyed. The site of an old mill to the west of the river, which is outside the proposed development area, was also checked for otter signs.

Searches for otter activity were made primarily for holts (otter nests or lairs), spraint (otter faeces, often found in elevated positions, on large stones, trees fallen across the river, tree roots, bridges, weirs or on grass piles on the bank), seals (paw-prints left in mud or silt), runways (pathways across fields, usually at bends in streams or rivers), slides and haul-out places. Holts are cavities in a river bank, often a hollow tree, between roots, rocky clefts, rabbit burrows or tunnels in peat. The entrance may be underwater with an air vent into the chamber, which is lined with dry vegetation. An otter may have many holts or resting sites within its home range.

Water voles leave some very distinctive sign. Their diet predominately consists of grasses, and areas of close cropped grass known as “lawns” are often found near burrow entrances where females graze close to dependant young. Water voles also have favourite feeding stations where they leave the neatly chopped remains of grasses, sedge or reed. They also leave latrines of black shiny droppings to mark their territory. Tracks are distinctive the rear feet have five toes while the forefeet have only four and leave a star shaped print. Searches were made primarily for latrines (regularly used places where faeces are deposited, usually on ledges or prominent mud-banks or prominent mud banks along the waters edge), droppings (individual faeces on pathways or ledges used by the animals), feeding stations (areas where food is cut into short lengths and lain side by side on ledges by the waters edge), paw-prints, nest holes, tunnels/runways and lawns.

Methodology for Dormice Survey

Surveys for evidence of dormice activity within the survey area took place on the 26th, 28th & 29th September 2000. Surveys were carried out according to recommended methods in literature (Bright & Morris 1989, 1996; Bright *et al* 1994; Macdonald *et al* 1998). Dormice are elusive and nocturnal, but leave distinctive sign in the form of feeding remains. Hazelnuts and chestnuts are an important part of dormouse diet before hibernation. Hazelnuts opened by dormice have a distinctive hole with a smooth inner surface and chisel-like marks on the outer surface. The survey area and adjacent possible suitable habitats were searched for hazel and sweet chestnut trees and any nuts found on the ground carefully examined for “nibbles”. A secondary survey technique was to search for dormouse nests. Nests are compact woven balls about 10-15 cm in diameter made of stripped honeysuckle bark, bramble leaves and rarely moss or grass. Nests lack a distinctive entrance, and may be found several metres above the ground, generally in dense vegetation, climbing plants or the cleft of a sapling. Sometimes they can be found in the shrub layer only a meter off the ground or even in bracken. Tree holes are also important nest sites (Macdonald *et al* 1998). It was not possible to employ other techniques for identifying the presence of dormice, such as the use of nest boxes or hair tubes, because of time constraints

Methodology for Bat and Owl Surveys

A survey of the survey are was undertaken on foot in the daytime of 26th September 2000, to allow a thorough examination of the site to search for roost sites and plan a route for the nocturnal bat detector survey. Mature trees were examined during the day for holes, cracks and crevices that were likely to contain bats. Binoculars, a torch and a bat detector were used to establish the physical presence of individual animals or established roosts.

A single bat survey took place on the evening of 28th September 2000. Weather conditions did not permit further surveys. During the survey, two surveyors walked the boundary hedgerows for half an hour before dusk and two and half-hours afterwards. Heterodyne (Bat Box III, QMC mini & Skye) and broadband (Anabat) bat detectors were used to record any bats that were foraging or passing through the site. Each surveyor had one bat detector set constantly at 83 kHz, the frequency of peak amplitude emitted by echolocating greater horseshoe bats. Additionally one surveyor watched the farm buildings for bats emerging between dusk and dark. The interior of the buildings were not investigated for the presence of bat droppings or roosting bats at the time of this survey.

Hayes Farm and the farm building complex (outhouses) were surveyed on 26th July 2001 for signs of current or recent use by bats and/or owls. All buildings were scanned from the outside for bat droppings or urine stains that could indicate points of entry by bats. The attic and cellar of the farmhouse and all accessible internal spaces within the farm building complex were searched for bats and bat faeces, urine stains, and other signs of current or recent use by bats. Searches were also made for owls, owl nests and owl pellets. It was noted that the farmhouse is inhabited and in relatively good condition with externally sealed walls and an intact slate roof. The farm building complex consisted of a number of attached barns, stables, tack rooms, a hay loft and other associated rooms. The external walls of the building complex were exposed brick and the majority of the roof was relatively new tin with some corrugated asbestos and iron. The building complex was not in use at the time of survey and while the walls and roof were generally in good condition the interior was dilapidated.

Breeding Bird and Invertebrate Surveys

The breeding bird and invertebrate surveys were undertaken by Andy Abbott of Abbott Ecology. He has had over 25 years wildlife identification experience and has a particular interest in the identification of the Sub-order Apocrita (ants).

Methodology for Breeding Bird Survey

Birds were recorded by visible sightings over three days in July and August 2001, with the aid of 10 x 50 binoculars, and also, in the thicker hedges and the wood, by sound. Any evidence of breeding, such as the presence of juveniles, or food being carried by parent birds, was noted.

Methodology for Invertebrate Survey

Insects and other invertebrates were searched for on flowers and leaves, under loose bark and under stones and logs on the ground over three days in July and August 2001. Flying insects were caught with a kite net and placed in a specimen tube for identification. Most species were identified in the field, sometimes with the help of a 10 x hand lens. A few specimens were brought back to the laboratory for later identification using keys and a microscope. A roughly similar amount of time was spent searching each habitat on the site, but differing weather conditions, especially of temperature, through the day and on different days, biased the number of species recorded in some habitats.

References

Bang, P. & Dahlstrom, P. 1974. *Collins guide to animal tracks and signs*. Collins, London.

Bright, P. W. & Morris, P. A. 1989. *A practical guide to dormouse conservation*. Mammal Society, London.

Bright, P. W. & Morris, P. A. 1996. *Dormouse conservation handbook*. English Nature, Peterborough.

Bright, P. W., Mitchell, P. & Morris, P. A. 1994. Dormouse distribution: survey techniques, insular ecology and selection of sites for conservation. *Journal of Applied Ecology* **31**, 329-339.

Harris, S., Cresswell, P. & Jefferies, D. 1989. *Surveying for badgers*. Occasional Publication of the Mammal Society No. 9. Mammal Society, Bristol.

Lawrence, M. L. & Brown, R. W. 1967*. Mammals of Britain. Their tracks, trails and signs*. Blandford Press, Dorset.

Macdonald. D.W., Mace, G. & Rushton, S. 1998. *Proposals for future monitoring of Btitish mammals*. Department of the Environment, Transport and the Regions, and Joint Nature Conservation Committee, London.

National Rivers Authority 1993. *Otters and river habitat management*. Conservation Technical Handbook 3 (subsequently reissued by the Environment Agency).

R.S.P.B, N.R.A & R.S.N.C. 1994. The new rivers and wildlife handbook. (Eds. D. Ward, N. Holmes & P. José). RSPB, Bedfordfordshire.

Strachan, R. 1998. *The water vole conservation handbook*. Environment Agency, English Nature & WildCRU, Oxford.

Villis, D. & Macdouall, A. 2000. A species handbook for local authorities. Guide notes for the consideration of protected species within local planning. English Nature, Peterborough.