

## **9 ECOLOGY AND NATURE CONSERVATION**

### **9.1 Introduction**

- 9.1.1 This chapter of the ES covers Nature Conservation issues for the outline application. It sets out the results of an ecological appraisal of the site from a wider study area.
- 9.1.2 The value of ecological features is interpreted within the context of the surrounding landscape, whilst the potential impacts arising from development, and strategies to minimise/compensate them, are described.
- 9.1.3 The appraisal is based on results from background data searches, habitat surveys and protected species surveys carried out during 2004 - 2009, and on information obtained through consulting the recognised bodies involved in nature conservation within the area. The habitats and species evaluations are based on the guidance from the Institute of Ecology and Environmental Management (IEEM).

### **9.2 Legislation and Planning Policy**

#### **Legislation**

- 9.2.1 Specific habitats and species receive legal protection in the UK under various pieces of legislation, including:
- The Wildlife and Countryside Act 1981 (as amended);
  - The Conservation (Natural Habitats &c.) Regulations 1994 (as amended);
  - The Countryside and Rights of Way Act 2000;
  - The Hedgerows Regulations 1997;
  - The Protection of Badgers Act 1992; and
  - The Natural Environment and Rural Communities Act 2006.
- 9.2.2 Where relevant, the assessment takes account of the legislative protection afforded to specific habitats and species.

#### **National Planning Policy**

- 9.2.3 Central government has issued guidance on nature conservation in Planning Policy Statement 9 (PPS9). It sets out the key principles of ensuring that the potential impacts of planning decisions on biodiversity and geological conservation are fully considered. These include:

Chapter 9.0  
Ecology and Nature Conservation

- The need for up-to-date assessments;
- The aim of maintaining and enhancing, restoring or adding to biodiversity and geological conservation interests;
- The need to take a strategic approach to the conservation, enhancement and restoration of biodiversity and geology; and
- The principle of planning decisions should be to prevent harm to biodiversity and geological conservation interests and this may include consideration of mitigation/compensation measures, implemented where appropriate using planning controls.

9.2.4 PPS9 provides guidance as to the protection of statutorily designated sites, including international sites, National Nature Reserves (NNRs) and Sites of Special Scientific Interest (SSSIs), as well as non-statutory regional and local sites. PPS9 also addresses development and wildlife issues outside these sites and seeks to ensure that planning policies minimise any adverse effects on wildlife.

9.2.5 PPS9 places emphasis on local authorities to further the conservation those habitats of principal importance, or those habitats supporting Species of Principal Importance, which are identified in Section 41 of the Natural Environment and Rural Communities Act 2006.

9.2.6 PPS9 requires that adverse effects of development on species of principal importance should be avoided through planning conditions or obligations and that planning permission should be refused where harm to these species, or their habitats, may result unless the need for, and benefits of, the development clearly outweigh the harm.

9.2.7 PPS9 requires that opportunities for improving biodiversity within developments should be maximised. It states that development proposals provide many opportunities for building-in beneficial biodiversity features as part of good design and also suggests that networks of natural habitat should be protected and repaired, and the fragmentation and isolation of natural habitats avoided.

### **Regional Planning Policy**

#### **Regional Planning Guidance 10 South West (RPG10) (September 2001)**

9.2.8 RPG10 contains one relevant policy, Policy EN1 Landscape and Biodiversity, which directs local authorities to include measures to protect, maintain and enhance the region's biodiversity.

**The Draft Regional Spatial Strategy for the South West 2006-2026 (June 2006)**

- 9.2.9 The relevant policy is Policy ENV1 Protecting and Enhancing the Region's Natural and Historic Environment, which directs local authorities to protect and enhance the region's environment and natural resources.

**Gloucestershire Structure Plan**

- 9.2.10 The Gloucestershire Structure Plan, which was formally adopted in November 1999 and has a plan period until 2011.
- 9.2.11 Policy NHE.1 Development and the Environment is deals with protecting countryside character and natural resources from harmful development.
- 9.2.12 The relevant parts of Policy NHE.2 Nature Conservation and Biodiversity deals with the protection and enhancement of biodiversity, and the protection of designated sites.
- 9.2.13 The relevant part of Policy NHE.8 Cotswold Water Park is concerned with considering development proposals in the context of the park's objectives, including nature conservation interests.

**Local Planning Policy**

**Cotswold District Local Plan 2001 – 2011**

- 9.2.14 During the previous application process, the Cotswold District Local Plan 2001 – 2011 was adopted (25 April 2006). As the application, was determined on the basis of this Local Plan, the relevant local policies are set out below.
- 9.2.15 Policy 4 Environmental Impact relates to harm to the natural environment from development.
- 9.2.16 The relevant parts of Policy 6 The Water Environment are concerned with protecting against harm to biodiversity of the water environment.
- 9.2.17 Policy 9 Biodiversity, Geology and Geomorphology deals with the protection of designated sites and species.
- 9.2.18 The relevant part of Policy 10 Trees, Woodlands and Hedgerows deals with the protection of ecologically or biologically important hedgerows.
- 9.2.19 The implications of these nature conservation policies have been incorporated into the development proposals.

### 9.3 Methodology

#### Baseline Data

- 9.3.1 While field survey is invaluable and provides a “snap-shot” of the species and habitats present on a site, it is also important to research existing ecological knowledge of the site, such as biological records, and any relevant ecological information from the surrounding area.
- 9.3.2 The initial spatial scope for the data search includes the area within 2 km (or greater) of the proposed development. This is the maximum area around an SSSI in which English Nature is able to seek automatic consultation on planning applications (paragraph 31 of PPG9). In some instances it may be relevant to collect specific information from a wider area, which may be helpful in determining the relative importance of the ecological receptors at different geographical scales. For example, to comment on the importance of the loss of 5ha of secondary woodland, it would be necessary to know the current extent of such woodland in a parish or county and the trends in land cover.
- 9.3.3 The following organisations and individuals have been contacted, variously, in February 2004, March 2005, September 2007 and February 2009 and, where relevant, the information provided has been incorporated with acknowledgement within this report.
- Natural England (NE) (formerly English Nature (Somerset and Gloucestershire Team));
  - Environment Agency (Lower Severn Area Office);
  - Cotswold Water Park Society;
  - Gloucestershire Centre for Environmental Records (GCER)(formerly Gloucestershire Environmental Data Unit);
  - Gloucestershire Bird Group;
  - Gloucestershire Bat Group;
  - Gloucestershire Badger Group; and
  - Gloucestershire Reptile and Amphibian Group.
- 9.3.4 In addition, Wetland Bird Survey Data was obtained from the BTO for this part of the Cotswold Water Park.

## Field Survey

### Habitats

- 9.3.5 The site was surveyed in January 2004, June 2004, July 2005, June 2007 and March 2009 using a technique based upon Phase I survey methodology as recommended by English Nature (Nature Conservancy Council, 1990), see *Appendix 9.1*. This 'extended' Phase I technique provides an inventory of the basic habitat types present and allows identification of areas of greater potential which require further survey. Any such areas identified can then be examined in more detail. The vegetation present was clearly visible and allowed an accurate assessment to be made.
- 9.3.6 Using the above method, the site was classified into areas of similar botanical community types with a representative sample of those species present at the time of the survey being described.
- 9.3.7 The lakes within the site were also assessed in more detail by using the Predictive System for Multimetrics (PSYM) technique developed jointly by the Environment Agency (England and Wales) and Pond Action (Howard, 2000). This method is summarised in *Appendix 9.1* and the data sheets included at *Appendix 9.2*.
- 9.3.8 A River Corridor Survey was also undertaken of the Court's Brook along the southern boundary of the site and the closest part of the River Coln. The survey methodology for this survey is summarised in *Appendix 9.1* and the survey results included at *Appendix 9.3*.
- 9.3.9 A charophyte survey was undertaken of the three lakes in July 2005. The survey methodology is summarised in *Appendix 9.1*.

### *Fauna*

- 9.3.10 In addition to the extended Phase I survey, various protected species surveys and updates have been undertaken in 2004, 2005 and 2007. The species/groups surveyed are:
- Badgers;
  - Bats;
  - Birds (winter and breeding);
  - Invertebrates (as part of the PSYM technique);
  - Otter;
  - Water vole; and
  - White-clawed crayfish.

9.3.11 The surveys were undertaken to the methodologies set out in *Appendix 9.1*.

### **Habitat and Species Evaluation and Impact Assessment**

9.3.12 The habitats and species evaluations are made with reference to the Institute of Ecology and Environmental Management's guidelines for Ecological Impact Assessment (IEEM, 2006).

9.3.13 These guidelines aim to give a degree of consistency in approach to evaluating the importance of the ecological features within the site and any effects or impacts a scheme will have upon them.

9.3.14 Firstly, the species or habitats must be valued and a commonly used framework involves assigning a level of geographical importance to ecological receptors. This framework incorporates a wide range of legislation and governmental guidance in assessing each feature's value.

9.3.15 Next, the impacts of the proposed scheme have to be predicted, taking into account different stages and activities within the development process. These impacts then have to be assessed for their significance, based upon the value of the species or habitat in question. The assessment of impact significance is done before and after any proposed mitigation to give an overall indication of significance.

9.3.16 The value of specific ecological receptors (sites, habitats or species) is assigned according to their level of importance using the following terms:

- International value;
- UK value;
- National value (i.e. England/Northern Ireland/Scotland/Wales);
- Regional value;
- County value;
- District value (or Unitary Authority, City, or Borough);
- Local or Parish value; and/or
- Of value within the context of the project site.
- 

9.3.17 Factors that are considered whether ecological effects are significant include extent; magnitude; duration; reversibility; timing and frequency; and cumulative effects.

### **Significance Criteria**

- 9.3.18 In accordance with the current IEEM guidance and terminology, a significant effect, in ecological terms, is defined as an effect (adverse or positive) on the integrity of a defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area, including cumulative effects. This means that a significant effect is one that causes a change in level of value of a habitat or species, e.g. an adverse effect that reduces the value from County to District level or a positive effect that increases value from District to County level.
- 9.3.19 Non-significant effects are those changes that do not cause an effect (adverse or positive) on the integrity of a site or ecosystem, or the conservation status of the habitat or species in question; that is, the effect is not sufficiently large to cause a change in level of value. For example, a habitat of District value subject to a non-significant positive effect, would be enhanced (such as through more suitable management, additional planting, bat boxes on trees, etc), but not to the extent that raised its value to that of County level.
- 9.3.20 If an impact is found not to be significant at the level at which the resource or feature has been valued, it may be significant at a more local level. For instance, a habitat of County value may not be affected, although a population of a species of Local value that it supports could be affected.
- 9.3.21 In accordance with the IEEM methodology, the value of any feature that will be significantly affected is then used to identify geographical scales at which the impact is significant. This value relates directly to the consequences, in terms of legislation, policy and/or development control at the appropriate level. So, a significant negative impact on a feature of importance at one level would be likely to trigger related planning policies and, if permissible, generate the need for development control mechanisms as described in those policies.
- 9.3.22 Whilst no definition is provided in the IEEM guidance, in keeping with the terminology used within this ES, magnitude of ecological impact significance is translated from the IEEM standard terminology into “minor”, “moderate” or “major” based on professional judgement.

### **Baseline Information**

#### **Background Data Searches**

- 9.3.23 The nearest statutory Sites of Nature Conservation Interest are as follows:
- The component part of the Cotswold Water Park SSSI that lies just to the south of the site (Lake 102A). This is designated for its aquatic plant interest; and

Chapter 9.0  
Ecology and Nature Conservation

- Whelford Meadow SSSI, which lies just to the south of the southeast corner of the site. It is designated for its grassland habitat.
- 9.3.24 The majority of the waterbodies (over 2.5ha) within the Cotswold Water Park are designated as a Key Wildlife Site (a non-statutory designation) for bird and invertebrate interest.
- 9.3.25 Information from the Environment Agency shows that the biological water quality of the nearby River Coln is between A (very good) and B (good). Information from 1994/5 that has also been supplied states that an area encompassing the site and a similar area of land to the east forms 'valuable habitat for otters'.
- 9.3.26 GCER hold three records for Natterer's bat *Myotis nattereri*; approximately 300m to the south of the Site in 2006; approximately 1.2km to the south of the Site in 2007; and approximately 1.9km to the south west of the Site in 2004.
- 9.3.27 They also hold three records of common pipistrelle *Pipistrellus pipistrellus*; approximately 1km to the east of the Site in 2005, approximately 1.2km to the south of the Site in 2007; and approximately 1.9km to the south west of the Site in 2004.
- 9.3.28 Records are also held for lesser horseshoe bat *Rhinolophus hipposideros* approximately 1km to the east of the Site from 2005, serotine bat *Eptesicus serotinus* approximately 1.2km to the south of the Site in 2007; brown long-eared bat *Plecotus auritus* approximately 1.2km to the south of the Site in 2007; and Daubenton's bat *Myotis daubentoni* and noctule *Nyctalus noctula* 200m to the south of the Site in 2006.
- 9.3.29 GCER hold five records of water vole *Arvicola terrestris* within 2km of the Site boundary. The two most recent records are approximately 1.1km to the south of the Site from 2006 and approximately 900m to the south east of the Site in 1984.
- 9.3.30 Four records for otter *Lutra lutra*, three from 2006 and one from 2000, are also held by GCER. The closest of these are approximately 500m to the east of the Site, in 2000, and approximately 300m to the south of the Site, in 2006. The CWPS have provided 2009 otter monitoring records from along the River Coln at Fairford and Whelford, along with a road kill casualty on the A417 within 50m of the Site.

### Habitats

- 9.3.31 The site supports the following habitats:
- Buildings;
  - Grassland;

- Hardstanding/gravel;
- Hedgerows and Treelines; and
- Waterbodies/watercourses.

9.3.32 All the features described are shown on *Fig 9.1 Habitat Plan*.

### **Buildings**

9.3.33 Milestone House and the associated buildings were subject to survey in 2007. They comprise a two-storey dwelling house (currently mainly disused) and a few storage sheds. The buildings were subject to bat surveys, see bat section, below, but no evidence of roosting was found. Other opportunities for wildlife are limited and they are not considered further in this assessment.

### **Grassland**

9.3.34 Most of the land surrounding the waterbodies comprises grassland that was created on the former gravel extraction areas. The grassland is mown regularly as part of the management of the fishery. Species recorded include scarlet pimpernel *Anagallis arvensis*, mugwort *Artemisia vulgaris*, field bindweed *Convolvulus arvensis*, cock's-foot *Dactylis glomerata*, teasel *Dipsacus fullonum*, willowherb *Epilobium* sp., cleavers *Gallium aparine*, meadow crane's-bill *Geranium pratense*, hogweed *Heracleum sphondylium*, field scabious *Knautia arvensis*, perennial rye-grass *Lolium perenne*, bird's-foot trefoil *Lotus corniculatus*, greater plantain *Plantago major*, silverweed *Potentilla anserina*, common fleabane *Pulicaria dysenterica*, primrose *Primula vulgaris*, selfheal *Prunella vulgaris*, lesser celandine *Ranunculus ficaria*, creeping buttercup *Ranunculus repens*, ragwort *Senecio jacobaea*, prickly sow-thistle *Sonchus asper*, white clover *Trifolium repens* and stinging nettle *Urtica dioica*. The grassland has not changed significantly since the start of the survey work, with periodic mowing and removal of arisings keeping the sward short for most of the year.

9.3.35 A grass verge is present on the southern side of the A417. It varies between approximately 2 and 4m wide and supports a species poor sward that is regularly mown. It is also subject to considerable spray from the adjacent road, particularly in periods of wet weather.

9.3.36 Small areas of amenity grassland are present within the grounds of Milestone House.

### **Hardstanding/Gravel**

9.3.37 Much of the area around Milestone House comprises hardstanding and gravel, which provides some limited opportunity for ruderal plant species, but is largely of limited value to wildlife. This habitat is not considered further in this assessment.

### **Hedgerows and Treelines**

- 9.3.38 Hedgerows and treelines are largely confined to the external boundaries of the site, but one hedgerow does exist within the site, running north to south between lakes 103 and 104.
- 9.3.39 Hedgerows are mature, often overgrown into treelines rather than intact hedges, such as along the southern boundary of the site. The hedgerows are generally dominated by hawthorn *Crataegus monogyna*, with other species recorded including field maple *Acer campestre*, sycamore *Acer pseudoplatanus*, ash *Fraxinus excelsior*, cherry *Prunus* sp., blackthorn *Prunus spinosa*, English oak *Quercus robur*, crack willow *Salix fragilis*, elder *Sambucus nigra* and English elm *Ulmus procera*. More details of the species composition is given in the tree survey report (*Appendix 10.3*) Management of the hedgerows and treelines is light and cover has increased slightly in some areas since survey work began in 2004, though this is not assessed as a significant change.

### **Waterbodies/Watercourses**

- 9.3.40 The following waterbodies and watercourses are present within or adjacent to the site:
- Lake 104: the largest of the lakes at approximately 20ha;
  - Lake 103: is the middle sized lake at approximately 3.6ha;
  - Lake 103A: the smallest lake at 1ha, situated in the southeast corner of the site;
  - Two ponds within the Milestone House site were until 2006, used for rearing carp for the commercial fishery.
  - A small, ornamental pond within the Milestone House site;
  - Court's Brook along the southern boundary; and
  - Other waterbodies/watercourses to the south of the site.
- 9.3.41 Each of the waterbodies was surveyed and is described in more detail under separate headings below, starting with the largest.

### **Lake 104**

- 9.3.42 Lake 104 is the largest waterbody that dominates the site. The edge of the lake is largely formed by short steep banks, but in places is shallowly shelving. The substrate is largely of stones, gravels and sand, which is bare in places, with aquatic vegetation present elsewhere.
- 9.3.43 There is a thin band of fringing vegetation around the edge of the lake, in the form of young willow *Salix* sp. trees, great willowherb *Epilobium hirsutum*, soft rush *Juncus effusus*, gypsywort *Lycopus europaeus*, purple loosestrife *Lythrum salicaria*, water mint *Mentha aquatica*, spiked water-milfoil *Myriophyllum spicatum*, white water-lily *Nymphaea alba*,

amphibious bistort *Persicaria amphibia*, common reed *Phragmites australis*, branched bur-reed *Sparganium erectum* and great reedmace *Typha latifolia*. The non-native and invasive Himalayan balsam *Impatiens glandulifera* is present along the eastern edge of Lake 104.

- 9.3.44 There are two islands present, I1 in the north-central part of the lake and I2 in the southwestern corner. The north-central one is covered by scrub and young trees, whilst the southwestern island is covered by grassland and ruderal vegetation.
- 9.3.45 The lake is stocked with pike *Esox lucius* and fishing pitches are located around the edge. Public Rights of Way (PRoW) exist around the lake. Consequently, the lake experiences a range of existing disturbances, including:
- Presence of humans, vehicles (cars are occasionally driven around the edges of the lake) and boats related to the fishery activity;
  - Presence of humans and dogs along the edges of the lake; and
  - Occasional, unauthorised use of the site by off-road motorcycles.
- 9.3.46 The results of the PSYM survey have indicated that the biological water quality of Lake 104 is good, but there is a low diversity of some invertebrate groups, such as beetles or dragonfly/damselfly larvae. The number of plant species is also low for the size of waterbody.
- 9.3.47 The results of the charophyte survey reveal that two species are present within the lake, namely common stonewort *Chara vulgaris* and fragile stonewort *Chara globularis*. Both are widespread species, found in a variety of habitats. Common stonewort is found in almost every type of aquatic environment, whilst fragile stonewort is most commonly found in ponds and excavated pits.
- 9.3.48 Distribution appears to be limited to shallow, open areas not shaded by overhanging vegetation or crowded by marginal aquatic vegetation. This distribution is shown on Figure 9.2. The more open areas in the south-eastern corner appear to be the most favourable part.

### **Lake 103**

- 9.3.49 The medium sized lake within the site and the most regularly fished, is stocked with trout. Vegetation around the edge of the lake is the sparsest of the three waterbodies, but aquatic plant species are present and include great willowherb *Epilobium hirsutum*, hemp agrimony *Eupatorium cannabinum*, yellow iris *Iris pseudacorus*, soft rush, gypsywort, purple loosestrife, white water-lily *Nymphaea alba*, amphibious bistort, common club-rush *Schoenoplectus lacustris*, water figwort *Scrophularia auriculata*, skullcap *Scutellaria galericulata*, bittersweet *Solanum dulcamara* and great reedmace.

Chapter 9.0  
Ecology and Nature Conservation

- 9.3.50 The results of the PSYM survey have indicated that the biological water quality of Lake 103 is good, but there is a lack of some invertebrate groups, such as beetles or dragonfly/damselfly larvae.
- 9.3.51 The results of the charophyte survey also recorded common stonewort and fragile stonewort from parts of the shoreline around Lake 103. Distribution is shown on *Fig 9.2 Stonewort Locations*.

**Lake 103A**

- 9.3.52 This is the smallest lake and is stocked with carp. It is fringed by willow coppice along the northern edges, which is interspersed by fishing pitches. Aquatic plant species recorded along the edge of the water include great willowherb, hemp agrimony, square-stalked St John's-wort *Hypericum tetrapterum*, yellow iris, soft rush and common reed *Phragmites australis*.
- 9.3.53 The results of the PSYM survey have indicated that the biological water quality of the Carp Lake is moderate to poor. No charophytes were recorded from this lake.

**Fish-rearing Ponds**

- 9.3.54 The fish-rearing ponds are small compared to other lakes and their use has resulted in turbid water conditions with few aquatic plants. Small compared to the other waterbodies and offering little for wildlife, these ponds are not considered further in this assessment.

**Ornamental Pond**

- 9.3.55 The ornamental pond is located just to the north of the Milestone House dwelling. It is approximately 1.5 by 2.5m in size and the surface is elevated to about 1m off the ground, supported by stone walls. It is lined and retains some water, though is only currently rain fed, as the mains water supply is not switched on. It is a former fish pond, though no fish are currently present. Given its elevated position and former use, opportunities for amphibians are negligible and it is not considered further in this assessment.

**Court's Brook**

- 9.3.56 The brook along the southern boundary of the site forms an overflow drainage channel from the River Coln. It has been subject to a specific River Corridor Survey in 2004 (*see Appendix 9.3*). The brook offers few wildlife opportunities due to the lack of aquatic habitat which is probably a consequence of hydrological changes following the gravel extraction process. However, vegetation is present alongside the brook in places and the brook offers opportunities for enhancements.

- 9.3.57 Since survey work was undertaken, flow has been re-instated in Court's Brook, as part of drainage improvement works. Consequently, most of the bank side vegetation has been cleared and is yet to re-establish.

### **Other**

- 9.3.58 The River Coln lies a short way to the south of the site, approaching closest to the southwest corner. Part of the Coln, closest to the site boundary was subject to a River Corridor Survey and the results are included at *Appendix 9.3*. The part surveyed offers a range of aquatic habitat opportunities, varying in shade cover, flow types and aquatic vegetation.
- 9.3.59 Two further lakes lie just to the south of the site, one of which is a component of the Cotswold Water Park SSSI, designated for its aquatic plant interest.

## **Fauna**

### **Amphibians**

- 9.3.60 The waterbodies within the site are considered sub-optimal for great crested newts due to a combination of factors, including large waterbodies with little sheltering emergent vegetation and stocked populations of fish predators; and lack of terrestrial refuges. Consequently, their presence has been assessed as unlikely and survey work has not been undertaken. They are not considered further in this assessment.

### **Badgers**

- 9.3.61 Surveys in 2004, 2005, 2007 and 2009 were undertaken for the presence of badgers *Meles meles* within the site. There are some areas of bramble scrub within the site that could be surveyed and that are large enough to potentially conceal a sett. However, the surveys recorded no evidence, such as latrines, feeding signs, setts, footprints or hairs. As such, it is considered that there is a low probability of badgers being present within the site, even in the areas of dense scrub. Badgers are not considered further in this assessment.

### **Bats**

- 9.3.62 Bat surveys were undertaken in 2004 and 2007 and have recorded a number of species utilizing the lakes for foraging.
- 9.3.63 In the 2004 surveys, a few foraging passes by Daubenton's bats were recorded on all three survey visits on Lake 104. Common pipistrelles and soprano pipistrelles *P. pygmaeus* were recorded foraging along hedgerows H8, H10, H11, H12 and H13 and along the southern water's edges of Lakes 103 and 104. One noctule was recorded flying over the site on the

Chapter 9.0  
Ecology and Nature Conservation

17th August survey, but there was no evidence of foraging within the site.

9.3.64 The 2007 activity surveys again recorded Daubenton's bats foraging regularly over Lake 104 and occasionally over Lake 103. Common pipistrelles and soprano pipistrelles were recorded foraging along hedgerows H8, H10, H11, H12 and H13 and along the southern water's edges of Lakes 103, 103A and 104.

9.3.65 In addition, the following records were made:

- Serotine was recorded flying over the Site;
- Natterer's foraging on the southern side of the Site; and
- One probable whiskered/Brandt's *Myotis mystacinus/brandtii* foraging within the southern part of the Site.

9.3.66 In 2007, bat surveys included roost surveys of Milestone House, the dwelling located adjacent to the north of Lake 103.

9.3.67 No evidence of bats was found either during the internal searches or external surveys of the dwelling. No evidence was recorded that any other bat roosts are present within the site.

**Birds - Breeding**

9.3.68 Breeding bird surveys have been undertaken in 2004 and 2007, and recorded a range of common bird species, typical of hedgerow, treelines and riparian vegetation. The full range of bird species recorded during the 2004 and 2007 surveys are included in the tables in Appendices 9.4 and 9.5, respectively.

9.3.69 The 2004 surveys recorded up to four pairs of reed bunting within the site. These are concentrated mostly around the edge of Lake 104, since it offers the largest area of suitable habitat. Reed bunting is a species identified in the Cotswold Water Park Biodiversity Action Plan. This corresponds with recent survey work carried out in the whole of the Cotswold Water Park which has recorded an average of 6.5 (2003) and 6 (2004) singing males for the survey area including lakes 102-104 (Harris, 2004).

9.3.70 More species were recorded during the 2007 surveys, including some introduced species, some waterfowl and some smaller songbirds. Reed bunting territories increased to five.

**Birds - Winter**

9.3.71 The Cotswold Water Park hosts internationally important numbers of wintering waterfowl (20,000) and nationally important winter populations of pochard, gadwall, tufted duck, coot and great crested grebe. Consequently, winter bird data has been gathered for the site from

two sources:

- Wetland Bird Survey (WeBS) data was obtained from the British Trust for Ornithology. This information was obtained for four 'sites', namely Lake 103, Lake 104 (no data is available for 103A), the Eastern half of the Water Park and the Water Park as a whole. The data is averaged over the five most recent years (that data is available for). The data is supplied for each 'site' in a series of tables, which include total counts, five-year average monthly counts for each species, five-year peak monthly counts of each species, five-year spring peak counts\* – for the period April to June, five-year autumn peak counts for the period July to October, five-year winter peak counts for the period November to March, and national and International importance of the site for each species. Data was initially obtained for the five-year period 99/00 to 03/04 (summarised in Table 9.1, below) and then updated with data from the five-year period 01/02 to 05/06 (summarised in Table 9.2, below and included at *Appendix 9.6*); and
- Field surveys of the site undertaken during winters 2003/2004 and 2004/2005. This data provides more detail on bird distribution and activity within the site, along with observations on other factors such as disturbance. The results from the individual surveys, along with notes on distribution and potential disturbance activities, are located in *Appendix 9.7*. Summary result tables for the lakes are at *Appendix 9.8*.

### **WeBS Data**

9.3.72 A simple summary of the WeBS data for the five-year period 99/00 to 03/04 is provided below at Table 9.1, for the five species that the Cotswold Water Park is nationally important. The table below shows the mean winter peak numbers (averaged over the last five years) from the BTO supplied WeBS data (Table 4c for each 'site'). The columns are for Lake 103, Lake 104, the Cotswold Water Park East and Cotswold Water Park as a whole.

Table 9.1

Species	Lake 103	Lake 104	Cotswold Water Park East	Cotswold Water Park
Great Crested Grebe	1	16	96	337
Gadwall	0	9	102	369
Pochard	0	40	755	1478
Tufted Duck	0	48	512	1301
Coot	11	149	2493	6446

Chapter 9.0  
Ecology and Nature Conservation

- 9.3.73 The five-year average peak counts show that Lakes 103 and 104, combined, support approximately 17.7% of great crested grebe, 8.8% of gadwall, 5.3% of pochard, 9.4% of tufted duck and 6.4% of coot in the Cotswold Water Park East.
- 9.3.74 Similarly, this data shows that Lakes 103 and 104, combined, support approximately 5.0% of great crested grebe, 2.4% of gadwall, 2.7% of pochard, 3.7% of tufted duck and 2.5% of coot in the Cotswold Water Park as a whole.
- 9.3.75 Wetland Bird Survey (WeBS) data received for the five-year period of 2001/2002 to 2005/2006 is summarised in Table 9.2, below, and is included at *Appendix 9.6*.

Table 9.2

Species	Lake 103	Lake 104	Cotswold Water Park East	Cotswold Water Park
Great Crested Grebe	1	14	96	338
Gadwall	0	12	83	429
Pochard	0	31	552	1037
Tufted Duck	1	42	537	1431
Coot	4	159	2238	5918

- 9.3.76 The five-year average peak counts show that Lakes 103 and 104, combined, support approximately 15.6% of great crested grebe (down 2.1% compared to 99/00 to 03/04), 14.5% of gadwall (up 5.7% compared to 99/00 to 03/04), 5.6% of pochard (up 0.3% compared to 99/00 to 03/04), 8.0% of tufted duck (down 1.4% compared to 99/00 to 03/04) and 7.3% of coot (up 0.9% compared to 99/00 to 03/04) in the Cotswold Water Park East.
- 9.3.77 Similarly, this data shows that Lakes 103 and 104, combined, support approximately 4.4% of great crested grebe (down 0.6% compared to 99/00 to 03/04), 2.8% of gadwall (up 0.4% compared to 99/00 to 03/04), 3.0% of pochard (up 0.3% compared to 99/00 to 03/04), 3.0% of tufted duck (down 0.7% compared to 99/00 to 03/04) and 2.8% of coot (up 0.3% compared to 99/00 to 03/04) in the Cotswold Water Park as a whole.
- 9.3.78 The WeBS data between the two periods analysed (99/00 to 03/04 and 01/02 to 05/06) show some variation, with some species numbers within the Site increasing and some decreasing in relation to the CWP East and the whole CWP. Overall, the assessment of value remains as being of District value.

*WeBS Field Survey Data 2008/2009*

- 9.3.79 Raw data from the 2008/2009 WeBS survey has been provided by the CWPS and is summarised in the table below. As the data has not yet been processed and amalgamated

into five year means or is available for the Water Park as a whole, so direct comparison with previous data sets is not possible. However, the figures for Lakes 103 and 104 have been calculated on the basis of the mean of the six, monthly survey visits (September 2008 to February 2009, inclusive), just as an indication that numbers appear to be broadly similar.

Table 9.3

Species	Lake 103	Lake 104
Great Crested Grebe	1	6
Gadwall	0	7
Pochard	0	7
Tufted Duck	3	10
Coot	5	141

### **Field Survey**

9.3.80 Due to its small size and enclosed nature, Lake 103A is rarely used by over-wintering waterfowl and this has been confirmed by field survey data. Lake 103 provides a bigger area and the field survey data recorded use of it more by some species than the WeBS survey.

9.3.81 Due to its size, Lake 104 supports by far the most winter birds within the site, as shown by the WeBS data and field survey data. Field surveys of Lake 104 divided the lake into quadrants (see the Habitat Plans in the Chapter 5 of the Environmental Statement), which were used to give an approximate indication of what parts were more heavily used by birds. From the thirteen winter 2003/2004 and winter 2004/2005 surveys undertaken, the average numbers of birds present per visit are as follows:

Table 9.4

Quadrant	Area (ha)	Shoreline (m)	Average bird count	Average bird density (individuals/ha)
Northeast (NE)	6	740	33	5.5
Southeast (SE)	5.2	503	30	5.8
Southwest (SW)	4.7	462	55	11.7
Northwest (NW)	4.4	570	69	15.7

9.3.82 Whilst a very simple view of the actual situation, the figures show that there is a bias of bird usage towards the western half of Lake 104, which does not appear to be related with the size of the quadrant area or the length of shoreline.

9.3.83 Field surveys undertaken for the three lakes indicate that Lake 104 does act as at least a partial night roost location for gulls in the surrounding area. However, this can vary on a day to day basis, with certain disturbance sources, such as motorbike riders, causing the gulls to take flight to other lakes.

Disturbances to Birds

9.3.84 During the survey work on the site since 2004, existing disturbances to bird species come from a number of sources, including the following:

- Fishery activities: Since the three lakes are currently an active fishery, fisherman on the banks and on boats, and fishery staff undertaking management can disturb birds. This disturbance appears to be concentrated around Lakes 103 and 103A, but does also extend to lake 104;
- Walkers and dogs: These affect Lake 104, due to the PRowWs that extend around it. The PRowWs do not follow the edge of Lake 104 closely, but in practice most walkers take a route close to the bank. Dogs are not on leads and are free to roam along the shoreline;
- Picnickers: Occasional groups were noted during the summer sitting adjacent to the bank, such as the southwest corner; and
- Motorbike riders: The grassland along the northern and western edges of Lake 104 was used by off-road motorbikes on one occasion during the surveys. The fisheries manager reported that this has happened before.

9.3.85 The birds utilising the lakes are subject to some baseline disturbance, which ranges from low intensity but regular activities, such as dog walking, to high intensity but occasional activities, such as the motorbikes.

9.3.86 During winter, the overall effect is to cause an exclusion zone around the edge of Lake 104 of approximately 30m width. Whilst birds are constantly moving around and some individuals are recorded within this zone, the majority of birds tend to stay towards the centre of the lake. This buffer zone effectively reduces the useable area of the lake by approximately 6.8ha.

9.3.87 Fencing erected to delineate the footpaths around the Lake 104 appears to have removed some of the shoreline disturbances.

Invertebrates

9.3.88 As part of the PSYM surveys of the lakes, invertebrate sampling was undertaken at a number of points around each waterbody. A range of common species were recorded, but of most note was the presence of American signal crayfish *Pacifasticus leniusculus* in a sample from the Lake 103A. The landowner has reported that the crayfish are also known from Lake 103.

9.3.89 Signal crayfish are an introduced species that both out competes the native white-clawed crayfish and also carries a fungal disease called crayfish plague, which can devastate native

crayfish populations. No crayfish were recorded from Lake 104.

#### **Otter and Water Vole**

- 9.3.90 No definitive evidence for the presence of water vole was recorded during the surveys, however, this species is known to be expanding its range within the Water Park, particularly with the mink control work that is being undertaken (information supplied by the CWPS).
- 9.3.91 No presence of otter was recorded within the Site, but, again, their presence is known from the along the River Coln (information supplied by the CWPS) and in the vicinity of the Site.

#### **Reptiles**

- 9.3.92 Opportunities for common reptiles, e.g. common lizard *Zootoca vivipara* and slow worm *Anguis fragilis*, within the site are very limited, as the grassland within the site is managed regularly enough to keep the sward short and prevent any chance of colonisation from off-site areas. The history of disturbance to the site during gravel extraction would also contribute to this situation.
- 9.3.93 The presence of waterbodies with some marginal vegetation may offer foraging opportunities for grass snake *Natrix natrix*, though the rest of the site lacks suitable egg-laying sites, such as areas of cut or rotting vegetation. As the scheme will continue to provide opportunities for reptiles, they are not considered further in this assessment.

#### **Other**

- 9.3.94 Rabbit *Orytolagus cuniculus* warrens are present in all field boundaries.

## **9.4 Ecological Evaluation**

- 9.4.1 The habitats and species evaluations are made with reference to the IEEM guidelines for Ecological Impact Assessment.

### **Habitats**

#### **Grassland**

- 9.4.2 The grassland areas are regularly managed species poor (in the case of the roadside verge and the amenity grassland) and a common and easily re-creatable habitat that offers little for wildlife within the Site. Overall, the grassland is assessed as being of negligible value.

Hedgerows and Treelines

- 9.4.3 The hedgerows and treelines are assessed as being of Local to District value. The habitat quality varies, while some are species rich, mature hedgerows, with others being species poor, gappy and over-managed. Hedgerows are a priority habitat within the UK National BAP.

Waterbodies/Watercourses.

- 9.4.4 The lakes within the site form three out of over 133 lakes in the wider Cotswold Water Park. Water quality is moderate/poor to good and the value is increased by the winter and breeding bird interest, particularly on Lake 104. The presence of signal crayfish in the Lake 103A and Lake 103 has a negative influence on the lakes diversity. The lakes are designated as a Key Wildlife Site as part of the overall Cotswold Water Park. The lakes are assessed as being of County value.
- 9.4.5 Court's Brook is assessed as being of between negligible value and of value within the site only.
- 9.4.6 The SSSI designated lakes just to the south of the site are assessed as being of National value.
- 9.4.7 The River Coln is assessed as being of between Local and District value.

**Fauna**

Bats

- 9.4.8 The assemblage of bats recorded on site, including the presence of the whiskered/Brandt's bat (with only a few records in the Water park) recorded in the 2007 surveys, is assessed as being of County value.

Birds – Breeding

- 9.4.9 Surveys have recorded a range of common species using the site, though some are of note, being listed in the Cotswold Water Park Biodiversity Action Plan 2007-2016. Overall, the breeding bird assemblage is assessed as being of Local to District value.

Birds – Winter

- 9.4.10 The three lakes support a range of wintering bird species, including between 2.8-4.4% (mean) of those present for which the Cotswold Water Park is nationally important. This is assessed as being of District value.

Invertebrates

- 9.4.11 A range of common species were recorded during the survey work. The presence of signal crayfish in the lakes has a detrimental influence. Overall, invertebrate interest is assessed as being of Local value.

Otter and Water Vole

- 9.4.12 No definitive evidence for the presence of water vole was recorded during the update surveys, however, this species is known to be expanding its range within the Water Park, particularly with the mink control work that is being undertaken (information supplied by the CWPS).
- 9.4.13 No evidence for the presence of otter was recorded within the Site, but, again, their presence is known from the along the River Coln and in the vicinity of the Site (information supplied by the CWPS), so they may occasionally use the Site. This potential, occasional use is assessed as being of Local to District value.

**Assessment of Impacts**

- 9.4.14 The potential impacts of the scheme upon the ecology of the site, prior to any mitigation measures are set out below.

**Habitats**

Grassland

- 9.4.15 The loss of some of the grassland area to the scheme is assessed as an adverse impact of negligible significance.

Hedgerows and Treelines

- 9.4.16 The vast majority of hedgerows/treelines are being retained, though a limited number will have sections removed for access (though every effort has been made to use existing gaps). This will result in non-significant impacts at a Local to District level.

Waterbodies/Watercourses.

- 9.4.17 There will be disturbance of the lake margins during construction, which could release sediments and pollutants into the water column, reducing water quality. There will also be the loss of shoreline to the access arrangements on the north-eastern edges of Lake 104 and to the development around Lake 103 and Lake 103A. Adverse impacts could be significant at a County level.

Chapter 9.0  
Ecology and Nature Conservation

- 9.4.18 There is some limited potential for water quality impacts to the adjacent SSSI lake, which could have an adverse impact at a National level.
- 9.4.19 There is potential for increased disturbance to the banks of nearby River Coln through increased public access from the southwest corner of the Site. Adverse impacts are likely to be localised to areas within a short distance of the Site and, therefore, could be significant at a Local level, but overall, impacts on the River Coln as a whole are likely to be non-significant.

## **Fauna**

### **Bats**

- 9.4.20 The scheme could cause fragmentation of the habitat and disrupt flightlines across site, and affect access to foraging areas. These could result in adverse impacts that are significant at a county level.

### **Birds – Breeding**

- 9.4.21 There will be loss of some breeding habitat around the edges of the lakes, though this is largely limited to Lakes 103 and 103A, which support smaller amounts of such habitat. There will also be increased disturbance both during construction (noise and lighting) and post construction from increased human presence, pets and use of Lakes 103 and 103A for recreation. Adverse impacts could be significant at a District level.

### **Birds – Winter**

- 9.4.22 Construction impacts of noise and lighting could disturb birds utilising the lake for roosting and feeding. There could be increased disturbance to birds from increased number of people walking around Lake 104, which could cause the loss of some area of lake for birds to utilise. There could be increased disturbance from recreational use of Lake 103 and 103A to birds. Adverse impacts could be significant at a District level.

### **Invertebrates**

- 9.4.23 Disturbance of the lake margins during construction will remove some bankside habitat and could reduce water quality in short term, though measures aim to provide improved habitat quality in the long term. Adverse impacts are assessed as being non-significant.

### **Otter and Water Vole**

- 9.4.24 With no confirmed presence of water vole within the Site or its immediate vicinity, impacts upon this species are assessed as negligible.

- 9.4.25 Movement of otters past the Site or potentially foraging within it, could be affected by the proposals to develop parts of the Site. However, given the size of the site and its location, movement across it north to south will not be prevented, given the retention of the western half as a quiet zone, and the River Coln provides movement in the west to east direction. Foraging opportunities will still exist within the lakes on site, particularly Lake 104. Overall, these impacts are assessed as being non-significant.
- 9.4.26 Increased recreational activity along the nearby parts of the River Coln could impact on otter movement along the river corridor, though, as otters are largely active at dusk and during the night and are less likely to be present during the day; it is unlikely that this would result in a significant adverse impact to them.

## **9.5 Mitigation And Enhancement Measures**

- 9.5.1 The principles of the mitigation and enhancement works are to combine the following elements:
- Retain Lake 104 for wildlife;
  - Provide new areas of habitat to compensate for those lost to the development; and
  - Integrate the needs for wildlife within the development.

### **Cotswold Water Park Biodiversity Action Plan 2007-2016**

- 9.5.2 Mitigation and enhancement measures have been undertaken with regard to the aims of the Cotswold Water Park Biodiversity Action Plan, which contains the following relevant action plans:
- Boundary Features;
  - Fen, Marsh and Reedswamp;
  - Rivers and Streams; and
  - Standing Open Water.
  - Bats;
  - Breeding Waterbirds;
  - Reed Bunting;
  - Stoneworts; and
  - Wintering Waterbirds.

### **Implementation of Mitigation and Enhancement Measures**

- 9.5.3 A Construction Method Statement (CMS) will be produced, to pull together all of the actions needed to avoid or mitigate adverse impacts during site preparation and construction. This will be implemented as a condition of planning permission.
- 9.5.4 The retained features within the site and the proposed new features will be implemented and managed in accordance with a combined Landscape and Ecology Management Plan (LEMP), designed to maximise wildlife value. This plan will also contain the information on the phasing of the development and mitigation measures to ensure minimal impacts on the wildlife of the site. This will be implemented through a legal agreement.
- 9.5.5 Both the CMS and the LEMP will be agreed with the Cotswold District Council, the Cotswold Water Park Society and other consultees.
- 9.5.6 If required, appropriate licences will be obtained from NE to implement the strategies necessary to conform with protected species legislation, as described below.
- 9.5.7 The mitigation and enhancement measures for individual features within the site, which will be incorporated into CMS the whole site management plan, are set out in the following sections.

### **Habitats**

#### **Grassland**

- 9.5.8 None proposed, though parts of the retained grassland in the western half of the site will be enhanced through management and seeding to improve its diversity and allow a taller sward height. Structural diversity will also be increased through creating new shallow waterbodies and planting scrub.

#### **Hedgerows and Treelines**

- 9.5.9 The loss of parts of a small number of hedgerows for access to the Site and around it will be offset by a range of new, native planting throughout the site. New planting will be in excess of that lost.

#### **Waterbodies/Watercourses.**

- 9.5.10 A Construction Method Statement will be produced that will contain measures to prevent pollutant run-off into the waterbodies.
- 9.5.11 The release of sediments into the water column is unavoidable, both for aspects of the development and the proposed habitat enhancements. Where possible, the sediment caused

by new waterbody creation will be allowed to settle before final connection into the existing waterbodies. The short term release of sediments is unlikely to cause problems for the aquatic plants in the Lakes, particularly 104. The lack of organic matter build up on the beds of the lakes means that there is unlikely to be a large release of nutrients into the water column (that would favour other aquatic plant growth over stoneworts). Provided bare substrate areas are kept and new ones provided, the stoneworts present within the site will continue to have opportunities as they are good colonisers.

- 9.5.12 Material used for the profiling of margins will be that sourced from within the site and will be the same as that already forming the banks and bed of the lakes. Topsoiling of margins will be reduced to a minimum to prevent a rise in nutrient levels.
- 9.5.13 Planting of trees and shrubs along parts of the edges to bolster existing vegetation of the lake and further screen those areas that already have established;
- 9.5.14 Access to the edges of the lake will be restricted in parts to prevent disturbance to the lake edge.
- 9.5.15 Management will continue to provide bare areas around the lake margins for stoneworts. .
- 9.5.16 Access will be controlled to the promontory on the southern side of the lake and further enhancement measures will be undertaken on this land to improve the opportunities for nesting birds, particularly reed bunting.
- 9.5.17 Himalayan balsam will be removed from the western shoreline through a hand pulling method.
- 9.5.18 Opportunities still exist to enhance Court's Brook, though flow has already been re-instated, by planting emergent aquatic plants that will provide additional habitat for insects and birds.
- 9.5.19 Measures will be implemented to reduce the potential increased disturbance to the banks of the River Coln. These will include information boards at the point of exit from the site (south-western corner) detailing its importance for wildlife signing and the advice of the on-site warden.
- 9.5.20 The scheme will ensure that there are no changes to the water levels of the lakes within the site that could affect water levels on the adjacent SSSIs and River Coln.
- 9.5.21 There are no direct surface water connections between the site and the SSSI lake or the River Coln, so there are no anticipated run-off impacts that need mitigating. Dust deposition from the proposed construction work is also not anticipated to cause impacts upon the adjacent SSSI or River Coln.

## **Fauna**

### **Bats**

- 9.5.22 The majority of the land being taken by the development is grassland, which is of little importance for bats, either as a movement corridor or a foraging resource, and no mitigation is proposed for this loss. The creation of new scrub and grassland matrix within the retained western part of the grassland will provide new foraging opportunities.
- 9.5.23 The hedgerow running north to south between Lakes 103 and 104 will have sections removed, but will be largely intact. New tree and shrub planting and the creation of new linear waterbodies will provide new links and stepping stones across the site.
- 9.5.24 The habitat connection along the south of Lakes 104 and 103A will be retained and enhanced, which will allow continued access to foraging over the waterbodies and hedgerows/treelines within the site, as well as to off-site resources.
- 9.5.25 In addition, a number of bat boxes (roost and hibernation) will be erected on mature trees within the site, particularly the southern boundary, where there are strong connections in to and out of the site.

### **Birds – Breeding**

- 9.5.26 The loss of some breeding habitat around the edges of the lakes will be off-set by the creation of new water edge habitat and enhancement of the retained parts.
- 9.5.27 Measures will be drawn up to reduce the likely increased disturbance, both during construction (noise and lighting) and post construction, from increased human presence, pets and use of part of the lake for recreation. Principle measures will include a Construction Method Statement to specify lighting levels and working times, and creation/enhancements around Lake 104, to reduce disturbance along this part of the shoreline and open up further use of the lake edge.

### **Birds – Winter**

- 9.5.28 Construction noise and lighting will be restricted to daytime periods only and any site lighting will of low intensity and directed away from the water.
- 9.5.29 The retention of Lake 104 for wildlife will continue to provide a large area for birds to move around in and avoid temporary disturbances.
- 9.5.30 Other easures to control disturbance along the shoreline will include visual and physical screening, and physical separation.

- 9.5.31 Visual screening: from new emergent vegetation in the lake margins that will screen the immediate water's edge, but allow longer views across the water. Existing visual screening already limits views in many places along the southern and western shoreline, and this vegetation can be strengthened with further tree and shrub planting. Many of the existing trees have grown up leaving the ground level vegetation sparse, so planting of low growing shrubs to thicken up the screening at the base of existing trees is also recommended;
- 9.5.32 Physical screening: planting of dense thorny shrubs and/or the use of low wire mesh/wooden fencing will prevent people and dogs getting access to the shore through vegetation and remove the element of surprise of suddenly appearing at the water's edge; and
- 9.5.33 Physical separation: Where visual screening is an issue, then moving people back from the edge where there is sufficient land, such as the southwest corner, is recommended. Measures could include a wet ditch or ha-ha.

#### **Invertebrates**

- 9.5.34 Construction of the scheme will remove some bankside habitat and could reduce water quality in short term. Short-term loss of habitat and disturbance to water quality will be offset in the medium to longer term by new habitat creation and enhancements to existing habitats of the lake margins.

#### **Otter and Water Vole**

- 9.5.35 The retention and enhancement of much of the lakeside habitat, along with the creation of new waterbodies, will offset any loss in terms of continuing to provide opportunities for water vole.
- 9.5.36 The retention of the Lake 104 for wildlife, will reduce potential impacts on otter from the nearby River Coln and allow continued opportunities for them to move into the Site from the south-western corner.

#### **Residual Effects**

- 9.5.37 The expected residual effects of the proposed development are set out below.

#### **Habitats**

##### **Grassland**

- 9.5.38 Permanent loss of some grassland will be compensated by the enhanced nature of the remainder. Overall impacts are assessed as **neutral**.

**Hedgerows and Treelines**

- 9.5.39 Any loss of hedgerow will be compensated for by new native planting in excess of that lost. This will result in a **non-significant positive** impact at a District level.

**Waterbodies/Watercourses.**

- 9.5.40 Impacts to the waterbodies within the site in the short term will be outweighed by the proposed enhancement measures in the medium to long term, resulting in **neutral to non-significant positive** impacts. **Negligible** impacts are predicted for off-site waterbodies.

**Fauna**

**Bats**

- 9.5.41 Bats will continue to be able to use the site both for foraging and as a movement corridor. The provision of bat roost boxes, habitat creation and increased aquatic marginal planting should provide new opportunities for these species, resulting in a **neutral to non-significant positive** impact at a County level.

**Birds – Breeding**

- 9.5.42 In the medium term, the opportunities for breeding birds should increase with the creation of new habitat, the increased areas of aquatic marginal planting and the provision of nesting boxes. This will result in a **neutral to non-significant positive** impact at a District level.

**Birds – Winter**

- 9.5.43 The measures put forward will minimise impacts in the short term and offset impacts in the medium to long term. A **neutral impact** is predicted.

**Invertebrates**

- 9.5.44 In the medium term, the proposed habitat creation measures and removal of fish predators should increase opportunities for these species, particularly the groups that are poorly represented at the moment. A **neutral to non-significant positive** impact at a Local level is predicted.

**Otter and Water Vole**

- 9.5.45 The western quiet zone, habitat creation and enhancement to off-set habitat loss and measures to reduce localised off-site disturbance will result in **neutral impacts** to these two species.

Cotswold Water Park Biodiversity Action Plan

9.5.46 The above mitigation measures also tie into the aims of the Cotswold Water Park Biodiversity Action Plan for the following action plans. Where not relevant, some objectives have been omitted from discussion, such as where they refer to the protection of features not present within the site or to the creation of features that are not relevant or beyond the scope of the site to deliver (e.g. large single areas of habitat creation).

**Boundary Features**

9.5.47 The relevant objective for this action plan is discussed below:

*“1) Retain, enhance and restore boundary features which are important for wildlife and are a key characteristic of the landscape.”*

9.5.48 The scheme retains and will bring into appropriate management all hedgerows of interest within the site.

**Fen, Marsh and Reedswamp**

9.5.49 The relevant objectives for this action plan are discussed below:

*“1) To maintain and manage all existing fen, marsh and reedswamp habitat in the CWP in appropriate condition.*

*2) To create and manage new reedbeds, fen and swamp communities for priority wetlands species, linking to existing habitats and wildlife corridors within and beyond the CWP.”*

9.5.50 The proposals include creating numerous new areas of reedswamp habitat within and round the development areas, within the retained habitat and in the new areas of habitat. A balance will be struck between this habitat and the bare substrate habitat required for other aquatic plants. Overall, the scheme will create more reedswamp habitat than is lost and will secure appropriate management of all such areas within the site.

### **Rivers and Streams**

9.5.51 The objective for this action plan are discussed below:

*“1) Ensure the continued improvement of Rivers and Streams and associated habitats in the CWP.”*

9.5.52 The scheme aims to improve the channel and river habitat of the Court’s Brook and will not directly impact the River Coln. Measures will be implemented to reduce indirect disturbance impacts to the banks of the Coln.

### **Standing Open Water**

9.5.53 The relevant objectives for this action plan are discussed below:

*“1) To maintain and enhance lakes with existing nature conservation interest and value.*

*3) To develop and promote appropriate zoning of built and recreational development and nature conservation within the CWP.”*

9.5.54 A suite of measures are proposed to retain the nature conservation interest of the lakes at similar or better levels to the current situation including the retention of Lake 104 for wildlife.

## **Species**

### **Bats**

9.5.55 The relevant objectives for this action plan are discussed below:

*“2) Protect existing bat roosts (including tree roosts) and important habitat features for bats, including commuting routes and foraging areas.*

*3) Enhance habitat for bats in the CWP by providing an increased number of roosting opportunities, improving existing and creating new foraging areas (particularly hedgerows, wetlands and woodlands).”*

9.5.56 Foraging and movement routes across the site will be retained, and the provision of bat boxes will increase the roosting opportunities within the Site over the current levels.

**Breeding Waterbirds**

9.5.57 The objective for this action plan is discussed below:

*“1) To maintain and increase the numbers of breeding waterfowl in the CWP.”*

9.5.58 The opportunities for breeding waterbirds will be maintained at similar levels, with the creation of new habitat and the increased areas of aquatic marginal planting off-setting any habitat loss.

**Reed Bunting**

9.5.59 The objective for this action plan are discussed below:

*“1) To maintain and increase numbers of breeding and wintering reed bunting in CWP.”*

9.5.60 The loss of some reed bunting habitat will be off-set by new habitat creation, resulting in similar or better opportunities for the species within the Site.

**Stoneworts**

9.5.61 The objectives for this action plan is discussed below:

*“1) To maintain the diversity of stonewort species in the Cotswold Water Park.*

*2) To maintain and enhance distribution and abundance of all species of stonewort currently recorded in the Cotswold Water Park”*

9.5.62 The creation of new habitat and instigation of appropriate management to the waterbodies will maintain the opportunities for stonewort species within the Site.

**Wintering Waterbirds**

9.5.63 The objectives for this action plan are discussed below:

*“1) Maintain numbers of wintering waterbirds at or above the Baseline 10 year mean of 1986-96.*

*2) Increase numbers of wintering waterbirds by 0.5% by 2016 relative to 10 year mean for 1986-96*

Chapter 9.0  
Ecology and Nature Conservation

9.5.64 The proposals aim to have a **neutral impact** on wintering waterbirds within the Site.

## 9.6 Summary

9.6.1 This part of the Environmental Statement provides the results of the ecological appraisal and assessment process relevant to the Environmental Impact Assessment for the proposed development at Fairford Lakes.

9.6.2 The appraisal and assessment has been undertaken with reference to the IEEM guidelines on Ecological Impact Assessment.

9.6.3 The appraisal and assessment has been based on desk studies and several detailed surveys undertaken in 2004, 2005, 2007 and 2009. The area surveyed included the proposed development area and areas of adjacent habitat.

9.6.4 The main ecological interest within the site is in the waterbodies and the associated breeding bird and winter bird interest, with some hedgerow and bat interest.

9.6.5 Potential significant impacts from the scheme relate primarily to its effects upon the waterbodies and winter bird interest.

9.6.6 Measures are proposed to reduce construction, disturbance and recreational impacts upon these features. The implementation of these measures will **reduce impacts to non-significant levels**.

9.6.7 The measures will also have a **positive impact** on a variety of other wildlife and habitats within the site, in the medium to long term.

9.6.8 A CMS will be produced, to pull together all of the actions needed to avoid or mitigate adverse impacts during site preparation and construction. This will be implemented as a condition of planning permission.

9.6.9 The retained features within the site and the proposed new features will be implemented and managed in accordance with a combined LEMP, designed to maximise wildlife value. This will be implemented through a legal agreement.

9.6.10 Both the CMS and the LEMP will be agreed with the Cotswold District Council, the Cotswold Water Park Society and other consultees.

## 9.7 References

- Altringham, J.D. (2003) *The New Naturalist: British Bats*. HarperCollins, London.
- Evans, D. (Ed.)(2004). *Gloucestershire Bird Report 2002*. The Gloucestershire Ornithological Coordinating Committee.
- Gregory, R.D., Wilkinson, N.I., Noble, D.G., Robinson, J.A., Brown, A.F., Hughes, J., Procter, D.A., Gibbons, D.W. and Galbraith, C.A. (2002). *The population status of birds in the United Kingdom, Channel Islands and Isle of Man: an analysis of conservation concern 2002-2007*. *British Birds*, 95: 410-450.
- Howard, S. (2000) *A guide to monitoring the ecological quality of ponds and canals using PSYM*. Environment Agency and Pond Action.
- Institute of Ecology and Environmental Management (2006). *Guidelines for Ecological Impact Assessment in the United Kingdom (version 7 July 2006)*. <http://www.ieem.org.uk/ecia/index.html>. Institute for Ecology and Environmental Management, Winchester.
- National Rivers Authorities (1992). *River Corridor Surveys: Methods and Procedures*. NRA, Bristol.
- Nature Conservancy Council (1990). *Handbook for Phase 1 habitat survey - a technique for environmental audit*. JNCC, Peterborough.
- Pollitt, M.S., Hall, C., Holloway, S.J., Hearn, R.D., Marshall, P.E., Musgrove, A.J., Robinson, J.A. and Cranswick, P.A. (2003) *The Wetland Bird Survey 2000-01: Wildfowl and Wader Counts*. BTO/WWT/RSPB/JNCC, Slimbridge.
- Strachan, R. (1998). *Water Vole Conservation Handbook*. EA/EN/WildCRU, Oxford.