10.0 ECOLOGY, NATURE CONSERVATION AND BIODIVERSITY

Summary

The ecology assessment collates and evaluates the available wildlife information in respect of the railway scheme, including the re-routing of the Drumgelloch to Bathgate cyclepath. A wide range of consultations were held with members of the public, local organisations and statutory bodies, including Scottish Natural Heritage. All comments were taken on board and advice implemented where practical. Surveys were commissioned by Network Rail to establish the range of flora and fauna on, and adjacent to the proposed Airdrie-Bathgate section of route, whilst available data from previous surveys was sufficient to inform the electrification of the Bathgate-Edinburgh section of route.

The main points arising from the consultations, data collation and surveys of flora and fauna on the Airdrie-Bathgate section include:

- within 5km of the route there are seven Sites of Special Scientific Interest, including three candidate Special Areas of Conservation and a National Nature Reserve;
- seven Sites of Importance for Nature Conservation were identified alongside the Airdrie-Bathgate line and five adjacent to the Bathgate-Edinburgh line, none of which cover the rail solum;
- a mosaic of small-scale habitats on the line, mainly neutral grasslands and scrub, which are limited in range by the narrow width of the line, the rubble construction method and lineside maintenance;
- adjacent habitats are dominated by arable and improved grassland with the bog at Raiziehill, Caldercruix lagoons, Tailend Moss and Hillend Reservoir notable for their diversity;
- no botanical species of national or regional importance were recorded, although the invasive non-native Japanese Knotweed was widespread between Bathgate and Airdrie; to control Japanese Knotweed, excavation and removal offsite to a licensed landfill will be required.
- breeding bird surveys recorded on land adjacent to the line include a range of common species and low numbers, less than 10 pairs of each species of Species of High Conservation Concern, namely House Sparrow, Reed Bunting, Song Thrush, Linnet and Yellowhammer; and
- the presence on adjacent land of protected species, namely Water Vole, Badger and Otter, are adjacent to the Airdrie Bathgate section of route, but none on the proposed line itself.

The potential effects of the project were assessed and mitigation suggested to reduce any adverse effects of the proposal. The residual effects after mitigation were then assessed for the significance of effects. No effects were identified on any sites of national or international importance. The residual effects involved small-scale, mostly temporary losses of habitat and long-term damage to the Caldercruix and Hillend Reservoir SINC.s.

The area of shoreline lost to the new cyclepath at Hillend is very small and will not affect any special interest, other than Otter. The Caldercruix SINC, proposed for a new station site, will result in substantial loss of habitat and loss of feeding and breeding habitat for a very small number of birds and could adversely affect Otter on the North Calder Water. Mitigation includes retaining as much of the best areas of
interest for wildlife. However, the site is a contaminated land-fill and mitigation is severely constrained.

Badger populations were recorded as low and agreed mitigation will involve limited fencing and underpasses to maintain movements and reduce potential casualties on the line.

Short-term disturbance to Otter will occur at Caldercruix, where a new station will be built. Mitigation includes reduction of lighting at dawn and dusk, construction of an artificial holt, planting scrub to provide cover and a ledge to ensure passage under the proposed bridge over the North Calder Water. Similar measures will be employed at Hillend Reservoir where an Otter rest area will be lost during cyclepath construction works. A disturbance licence from the Scottish Executive will be required prior to starting any works affecting Otter at these two sites. Emergency procedure guidance has been written for Badger and Otter and an ecologist will be employed to advise during all works.

In accordance with best practice, manuals have been written to provide a Code of Construction Practice and a Lineside Vegetation Management Plan. Full cognisance has been made of legal obligations in addition to the UK Biodiversity Action Plan, Network Rail Biodiversity Plan and all relevant Local Biodiversity Action Plans.

Residual effects on wildlife were found to be in the range of negligible-moderate significance for Airdrie-Bathgate and negligible-slight or moderate for Bathgate to Edinburgh. Residual effects on Badger cannot be fully determined until a field survey is undertaken.

10.1 Introduction

Ironside Farrar instructed David Bell, ECOS Countryside Services, to carry out an ecological assessment for inclusion in the Environmental Statement in support of the proposal to re-open the Airdrie-Bathgate railway, currently in use as a cyclepath. In addition to Airdrie-Bathgate, it also looks at the proposed electrification of the existing Bathgate-Edinburgh line.

Walkover surveys were undertaken in September 2003 and during 2004 allowing some species listing and identification of habitat priorities to supplement the existing data. This was followed by desktop data collation, consultation and a raft of surveys in 2005 to address issues relating to Red List birds and both UK and European protected species.

10.1.1 Sources of Information

Consultations

- Scoping response from Scottish Executive Environment Group (SEEG), letter dated 19.12.03.
- Scoping opinion from West Lothian Council, letter dated 25.2.04.
- Scottish Natural Heritage (SNH), letter dated 27.11.03.
- SNH, review meeting 12.9.05.
- Royal Society for the Protection of Birds (RSPB Scotland), letter dated 24.2.04.
- Conservation and Greening Unit, North Lanarkshire Council, including ongoing discussions via letter and e-mail from 13.04.04 and site meetings held on 16.11.05 and 24.03.06;
- Site meeting 12.10.05, Mr Shanks, 182 Main Street, Plains.
• Draft ES consultations with West Lothian Council, North Lanarkshire Council and SNH in February/ March 2006.

**Summary of key consultation advice relating to ecology**

• Full account must be taken of the relevant wildlife legislation backed up by surveys to establish the status of protected species (SEEG);

• Surveys must be undertaken at an appropriate time of year for species. Any mitigation must also take account of impacts in the context of the Local Biodiversity Action Plan (West Lothian Council and North Lanarkshire Council);

• Unlikely that any important wild bird populations will be affected but the EIA should include a bird study. Where bird habitats are lost compensatory provision must be made, especially for any scrub (RSPB Scotland); and

• Protected species surveys are recommended on the basis of existing knowledge (SNH).

**Data collation from key sources**

• Network Rail instruction
• Babtie, Consulting Engineers
• SNH Area Officers for West Lothian and North Lanarkshire
• RSPB database
• Lothian Wildlife Information Centre (LWIC)
• Jenny Storey, Ecologist, North Lanarkshire Council
• Paul Baker, Ecologist, North Lanarkshire Council
• Lothian and Clyde Bird Recorders
• Edinburgh and Lothian Badger Group
• Lanarkshire Badger Group

**Summary of key information relating to ecology on the route**

• There are no known European sites or species adjacent to the route
• There are no known sites of national importance adjacent to the route
• There are European sites and site of national importance close to the route
• The corridor of the route passes by four Wildlife Sites/SINCs
• Three protected species are known to use habitats on the route, namely Otter, Water Vole and Badger
• Sites to the east are known to be at least locally important for butterfly species

**Site-specific surveys**

• Breeding Bird Survey, ECOS Countryside Services
• Great Crested Newt Survey, ECOS Countryside Services
• Otter Survey, ECOS Countryside Services
• Water Vole surveys, ECOS Countryside Services
• Japanese Knotweed, ECOS Countryside Services
• Badger Survey, JDC Ecology
• Bat Survey, JS Pritchard, Bat Consultant

**Summary of key desktop records relating to ecology**

• Since being discontinued, sections of the route have developed scrub habitats that are potentially important to breeding birds;
• Several wetlands and ponds have developed along the route and are likely to be lost to construction; and
• Japanese Knotweed is frequent in the western section of the route. This has legal implications for handling and disposal during construction. It also presents a serious risk to biodiversity and a physical threat to rail and cyclepath infrastructure.

Relevant Designations and Guidance

The Conservation (Natural Habitats Etc) Regulations 1994
These regulations transpose EC nature conservation directives into UK law

This circular provides guidance on assessing the significance of any project on a Natura 2000 Site i.e. a Spa or SAC.

Nature Conservation (Scotland) Act 2004
Passed by the Scottish Parliament on 5 May 2004 and effective from November 2004, it introduces a wide range of protection and enforcement measures to safeguard and enhance wildlife. In addition to new measures to protect wildlife and habitats under this Act, biodiversity is identified as a responsibility of public bodies and they have a duty to conserve biodiversity whilst exercising their functions.

United Kingdom Biodiversity Action Plan (UKBAP)
This Plan implements the Government’s commitment to the Earth Summit in Rio de Janeiro in 1992. It identifies priority habitats and species for the UK.

Local Biodiversity Action Plans
Three Local Biodiversity Action Plans cover the route:
• West Lothian Biodiversity Action Plan (WLBAP)
• Falkirk Area Biodiversity Action Plan (FABAP)
• North Lanarkshire Biodiversity Action Plan (NLBAP)

Natural Heritage Futures-West Central Belt
This recent publication by SNH provides a vision of sustainable land use and development. It seeks to reverse trends in decreasing diversity, loss of habitat and loss of local character. The key priorities are an integrated approach to all land-uses and the need for dialogue to ensure this co-ordinated approach.

This document is newly published by the RSPB and identifies UK bird species in terms of conservation concern, with Red List species being of highest concern.

Protected Sites
In the absence of European and UK designated sites, regional protection is provided by the non-statutory Wildlife Sites and Sites of Importance for Nature Conservation.

Protected Species
There is a legal obligation to ensure that species-specific surveys are undertaken to ensure that no wildlife laws are broken by the rail link proposals. Known protected species include Bats, Otter, Water Vole and Badger. The relevant legislation for known species is:

United Kingdom
• Badger: Appendix III of Bern Convention of the Conservation of European Wildlife and Natural Habitats; Protection of Badgers Act 1992; Wildlife & Countryside Act 1981, Schedule 5; and
**European**


In general this legislation protects both species and their shelters.

**Other Guidance**

6. Inventory of Raised and Blanket Bog Sites (See Figure 10.1)
7. Inventory of Ancient, Long-established & Semi-natural Woodland (Figure 10.1)

### 10.2 Baseline Conditions

Baseline information on statutory sites and protected species was provided by SNH and is included in Figure 10.1.

#### 10.2.1 General Ecological Site Description

**Statutory designated sites**

There are no known statutory sites within the proposed rail and cyclepath corridor. However, close to the route there are seven SSSI, three of which are proposed European Sites and one is a National Nature Reserve. Locations are illustrated in Figure 10.1, Habitat and Species Map 1 and a list is provided in Table 10.1 below. In consultation, February 2006, SNH advised that the Firth of Forth, as a European Site, must be included in the assessment of potential impacts.

**Table 10.1 Designated Statutory Sites**

<table>
<thead>
<tr>
<th>Site Name</th>
<th>NGR</th>
<th>Distance</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>River Almond, Firth of Forth tributary</td>
<td>NT030820</td>
<td>14km N</td>
<td>SSSI, SPA</td>
</tr>
<tr>
<td>Lady Bells Moss</td>
<td>NS810651</td>
<td>2.5km N</td>
<td>SSSI</td>
</tr>
<tr>
<td>Longriggend Moss</td>
<td>NS821696</td>
<td>2.5km N</td>
<td>SSSI</td>
</tr>
<tr>
<td>Black Loch Moss</td>
<td>NS855695</td>
<td>3.0km N</td>
<td>SSSI; SAC</td>
</tr>
<tr>
<td>Blawthorn Moss</td>
<td>NS886684</td>
<td>1.0km N</td>
<td>SSSI; SAC; NNR</td>
</tr>
<tr>
<td>East Kirkton Quarry</td>
<td>NS990691</td>
<td>2.0km NE</td>
<td>SSSI; cSAC</td>
</tr>
<tr>
<td>Petershill</td>
<td>NS985962, NS985705, NS988708</td>
<td>2.0km N, 2.5km N, 3.0km N</td>
<td>SSSI</td>
</tr>
<tr>
<td>Tailend Moss</td>
<td>NT013678</td>
<td>3.0km E</td>
<td>SSSI</td>
</tr>
</tbody>
</table>
Acronyms: SSSI (Site of Special Scientific Interest); SPA Special Protection Area, cSAC (Candidate Special Area of Conservation); NNR (National Nature Reserve)

Non-statutory designated sites

Table 10.2 identifies three Sites of Importance for Nature Conservation (SINCs) likely to be affected by the proposal to reopen the rail route.

Table 10.2: Wildlife Site/SINC Summary

<table>
<thead>
<tr>
<th>Site name</th>
<th>NGR</th>
<th>Distance from route (km)</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caldercruix</td>
<td>NS 814677</td>
<td>0</td>
<td>Wetland habitats</td>
</tr>
<tr>
<td>Hillend Reservoir</td>
<td>NS 835675</td>
<td>0</td>
<td>Standing water</td>
</tr>
<tr>
<td>Raiziehill Moss</td>
<td>NS 880664</td>
<td>0</td>
<td>Raised bog</td>
</tr>
</tbody>
</table>

10.2.2 Habitats

The data for habitats is based on data and maps provided by the two biological databases in West Lothian and Lanarkshire. (See Appendices 4C and Appendix 4D). It includes habitats that adjoin, as well as being present within the route. The survey data provided also includes target notes highlighting special interest. Further target notes are provided in Appendix 4A.

10.2.2.1 List of Recorded Habitats

A1.1.1 Woodland, broad-leaved, semi-natural
A1.1.2 Woodland, broad-leaved, plantation
A1.2.2 Woodland, coniferous plantation
A2.1 Scrub, dense
A2.2 Scrub, scattered
B1.2 Grassland, acid, semi-improved
B2.1 Grassland, neutral, unimproved
B2.2 Grassland, neutral, semi-improved
B4 Improved grassland
B5 Marshy grassland
C3.1 Tall ruderals
E1.6.1/ E1.6.2 Blanket/ raised bog
E1.7 Bog, wet modified
F1 Swamp
G2 Running water
I2.2 Artificial spoil

10.2.2.2 Summary of Recorded Habitats

The habitats that have been recorded along and adjacent to the route, are typical of lowland central belt land-use. Past use as a railway and the present use as a section of the national cyclepath network having most impact on the type of habitat recorded by existing surveys. The cyclepath is a narrow tarmacadam track. Livestock farming with planted woodland and the occasional remnant of mine workings dominates adjacent land. Hillend Reservoir is a notable feature in the west as are a scatter of peatlands.
Along the former railway line are habitats associated with naturally reverting vegetation in response to relaxation of management pressures. Scrub invasion is widespread and dominated by Silver Birch, whilst the grasslands are largely either coarse neutral grasslands, or acid grasslands where the soil is more acidic. The best scrub is located at either end of the proposed route whilst there are locally rich botanical areas (see Target Note 15). There are no peatlands on the track but there are scattered mosaics of ruderals, particularly Rosebay Willowherb. The highly invasive alien plant species, Japanese Knotweed, is present at eight locations along the track. Where drainage has been impeded there are small flushes, wetlands and ponds.

Improved grassland and small isolated shelterbelts dominate adjacent farmland. The area around Blackridge has a number of bings with a mosaic of wetlands. To the west of Blackridge, the Raiziehill raised bog is a distinctive feature as is the reservoir at Hillend.

10.2.2.3 Woodland

The woodland inventory map, Figure 10.1, Map 3, shows that there is limited woodland along the route. Two areas appear to join the north side of the route at Bedlormie House (Ancient Woodland) and at Forrestfield, near the east end of Hillend Reservoir (Long-established Woodland). The National Woodland Inventory also identifies several small plantations at Entryfoot and Westrigg.

10.2.2.4 Bogs

A series of peatlands are a feature of the southern side of the central section of the route. The route divides the large Raiziehill raised bog. See Figure 10.1, Map 2.

10.2.2.5 Species

Desktop

The LWIC data for the eastern section highlights a number of rarities adjacent to the route but none on the route itself.

North Lanarkshire Council provided species lists for Caldercruix Moss, Hillend Reservoir and Wester Braco, Moffat Hills & Lily Loch SINCs. Of these sites with species lists, only Hillend and Caldercruix Moss are likely to be directly affected by the proposal and in the lists provided there are no species of special nature conservation interest. The presence of Canada Geese on Hillend Reservoir has been highlighted as a potential hazard regarding overhead electrical lines at Hillend Reservoir.

Site survey results

Plants

Botanical species listing was undertaken during the various surveys. A species list is included in Appendix 4B. Species of note included several scattered Broad-leaved Helleborine immediately to the west of Plains and scattered Japanese Knotweed (see Table 10.3 overleaf for location), whilst the remainder were common species typical of the range of habitats encountered along a disused railway. Oxeye Daisy and Ragged Robin are biodiversity priority species found along the route.
Table 10.3. Distribution of Japanese Knotweed

<table>
<thead>
<tr>
<th>Stand</th>
<th>National Grid Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stand 1</td>
<td>NS 95959 67413</td>
</tr>
<tr>
<td>Stand 2</td>
<td>NS 95867 67401</td>
</tr>
<tr>
<td>Stand 3</td>
<td>NS 82439 67581</td>
</tr>
<tr>
<td>Stand 4</td>
<td>NS 82311 67625</td>
</tr>
<tr>
<td>Stand 5</td>
<td>NS 82110 67667</td>
</tr>
<tr>
<td>Stand 6</td>
<td>NS 79687 66709</td>
</tr>
<tr>
<td>Stand 7</td>
<td>NS 79579 66476</td>
</tr>
<tr>
<td>Stand 8</td>
<td>NS 79062 66155</td>
</tr>
<tr>
<td>Stand 9</td>
<td>NS 78498 65802</td>
</tr>
<tr>
<td>Stand 10</td>
<td>NS 78339 65682</td>
</tr>
<tr>
<td>Stand 11</td>
<td>NS 78280 65624</td>
</tr>
<tr>
<td>Stand 12</td>
<td>NS 78121 65505</td>
</tr>
<tr>
<td>Stand 13</td>
<td>NS 78027 65459</td>
</tr>
<tr>
<td>Stand 14</td>
<td>NS 77963 65430</td>
</tr>
</tbody>
</table>

Great Crested Newt

In season surveys were undertaken following methodology outlined in Gent T and Gibson S (1998) *Herpetofauna Workers Manual, JNCC*. This involved one daytime and one night-time survey of seven ponds on or within 100m of the route.

No Great Crested Newts were found in any water bodies adjacent to, or on the line. As previously reported, the site at Bathgate (NS983680) was not found to hold Great Crested Newts at the time of survey. Palmate Newt were found to be widespread and present on most water bodies. Three Palmate Newt breeding sites were identified on the line in the vicinity of Standhill Farm, NS 895667.

Mr R Shanks, 182 Main Street, Plains reported Great Crested Newt in his garden pond, which was adjacent to the route, however on investigation the newts were identified as Palmate Newt.

The findings of the survey concur with historical data and a recent national survey by SNH, (Alexander, L. (1997). National survey of the great crested newt *Triturus cristatus*. Contract for SNH.) The conclusion of the survey is that there are no known Great Crested Newt populations along this route.

Birds

Breeding bird surveys were carried out May-July 2005 following atlas based methodology, as used by SNH for SSSI Site Condition Monitoring. Briefly this entailed two visits made between mid April and the end of June to record birds in a corridor 100m either side of the cyclepath. All birds were recorded including non-breeding birds. Only waterfowl, raptors and Red List species were mapped using notation adopted by the Common Bird Census (British Trust for Ornithology, Williamson 1964). All breeding bird registrations were made in three categories, which are possible, probable and confirmed breeding using standard CBC activity codes.
Activity codes

1 Possible Breeding

H Species observed in breeding season in possible breeding habitat.
S Singing male(s) present (or breeding calls heard) in breeding season.

2 Probable Breeding

P Pair observed in suitable breeding habitat in breeding season.
T Permanent territory presumed through registration of territorial behaviour on at least two different days, a week, or more apart, at the same place.
D Display and courtship.
A Agitated behaviour or anxiety calls from adults.
I Brood patch on adult examined in hand, indicating incubation.
B Building nest or excavating nest-hole.

3 Confirmed Breeding

DD Distraction display or injury feigning.
UN Used nest or egg shells found (occupied or laid during period of survey).
FL Recently fledged young (nidicolous birds) or downy young (nidifugous birds).
ON Adults entering or leaving nest-site in circumstances indicating occupied nest (including high nests or nest-holes, the contents of which cannot be examined), or adults seen sitting on the nest.
FY Adults carrying food for young or faecal sac.
NY Nest containing young (seen or heard).

Table 10.4 Breeding bird survey, summary of notable interest

<table>
<thead>
<tr>
<th>Species</th>
<th>Possible Breeding (Prs.)</th>
<th>Probable Breeding (prs.)</th>
<th>Confirmed Breeding (prs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>House Sparrow</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Linnet</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Reed Bunting</td>
<td>7</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Skylark</td>
<td>6</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Yellowhammer</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

In addition to the above species, two pairs of Curlew were probable breeders on Raiziehill Bog and a family of Long-eared Owl were heard calling to the west of Plains. Raptors were represented by frequent sightings of soaring Buzzard, hunting Kestrel and Sparrowhawk, but none were known to be breeding on or immediately adjacent to the route. Other notable records included one sighting of Stonechat at Entryfoot. Common Sandpiper and Mallard are probable breeders on Hillend Reservoir.

The numbers of birds are low with most Reed Bunting registrations on Raiziehill Moss and most Skylark registrations opposite Northrigg. Wetland between the cyclepath and the A89 at the west end of Hillend Reservoir was also notable. Four of the Linnet registrations were made at one patch of gorse at Bedlormie Toll.

In conclusion, Raiziehill Moss supports locally important numbers of birds namely, Curlew, Reed Bunting and Yellowhammer, whilst the new plantations around Northrigg hold a local concentration of Skylark.
**Badger**

A one kilometre wide survey by JDC Ecology concluded:

- That badgers were active with eight setts located within the corridor, three of which were active main setts, four are relic setts and one was of unknown status.
- These records were supplemented by an additional nine setts located in records of previous surveys, outwith the corridor. Two of these nine were mains setts at the time of recording.
- Five social groups were identified from past and current records, and based on past Central Belt experience was considered to be of lower than normal density.
- Field evidence was very low, only two potential crossing points were identified.
- It was estimated that the rail line would bisect territories of six social groups (two of which were relict).

Due to potential persecution issues, this report and the data therein are confidential but will be made available to statutory consultees.

**Bats**

A bat survey was carried out in August 2005 by Stewart Pritchard with the aim of assessing bat roost status along the route. This involved a visual inspection of 28 structures (bridges and culverts) and several mature trees on, or adjacent, to the route for signs of roosting bats and suitable roost sites. Four species of bat are known from the three 10km squares covering the route. (See Appendix 4F).

No signs were found of any use of these 28 structures, or of trees, by bats and this concurs with other bridge survey data from Fife and NE Scotland. This may be due to the fact that the structures offered few apparently suitable roost sites, such as crevices and they are well maintained.

**Otter**

River crossings and water bodies on, or adjacent to the route, were surveyed according to the methodology recommended in the publication *Otters: Ward D, Holmes N & Jose P. (1994). The New Rivers & Wildlife Handbook, RSPB et al.*

This involved checking 500m either side of five river crossings and Hillend Reservoir south shore. The river crossings were the Nether Braco Burn, North Calder Water, Blackridge Burn, Blackmoss Burn and Bathgate Water.

Three site survey visits were undertaken during July 2005, October/November 2005 and March 2006 (see Appendix 4G). At this time recording signs of Otter such as spraint activity is lower than in winter and other signs are more difficult to see due to summer growth. Recorded signs of Otter activity were made only in the west, with no activity recorded in the east. Records are summarised in Table 10.5 below:

**Table 10.5 Otter Record Summary**

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>NGR</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hillend Reservoir</td>
<td>26.7.05</td>
<td>NS 84209 67110</td>
<td>Two old spraints</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NS 84007 67146</td>
<td>Fresh spraint</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NS 83952 67133</td>
<td>One old spraint</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NS 83904 67129</td>
<td>One fresh four old spraints</td>
</tr>
<tr>
<td></td>
<td>22.11.05</td>
<td>NS 84840 67152</td>
<td>Rest area under a wind blown Elm</td>
</tr>
</tbody>
</table>
Table 10.5 continued.

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>NGR</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS 84212 67106</td>
<td>Old spraint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NS 84159 67103</td>
<td>Old spraint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NS 83933 67114</td>
<td>Fresh spraint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NS 83849 67112</td>
<td>Old spraint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NS 83664 67077</td>
<td>Two fresh spraints</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NS 83226 67007</td>
<td>Fresh squit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.3.06</td>
<td>NS 84781 67158</td>
<td>Eight old and three recent spraints on rocks, close to rest area</td>
<td></td>
</tr>
<tr>
<td>NS 84812 67156</td>
<td>Three old spraints on rocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NS 84832 67154</td>
<td>Three old spraints, on a log</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NS 83959 67135</td>
<td>Fresh spraint on a rock by the shore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NS 83868 67128</td>
<td>Recent spraint on a rock by the shore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Braco Burn</td>
<td>22.11.05</td>
<td>NS 83965 67004</td>
<td>Fresh Otter spraint under the road bridge</td>
</tr>
<tr>
<td>North Calder Water</td>
<td>27.10.05</td>
<td>NS 79317 66127</td>
<td>Spraint</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NS 79315 66136</td>
<td>Rest area</td>
</tr>
</tbody>
</table>

The conclusions of these surveys are:

- Otter are resident on Hillend Reservoir and make extensive use of the south shore whilst hunting and occasionally for resting. This was supported by observation by fishermen (pers. comm.);
- No breeding holts were located despite extensive searches;
- Otter are also present on the North Calder Water and are likely to make extensive use of the river, again a view supported by Paul Baker, Ecologist NLC, based on his more extensive knowledge of the area;
- A Foxhole with an Otter spraint at the entrance was identified by JDC on the shore of the North Calder water at Caldercruix. It was at NGR NS 81947 67500 and further spraints were identified on the shore. This location is approximately 500m east of the proposed Station works at the Lagoon and directly adjacent to a current housing construction site; and
- An Otter Disturbance Licence will be required for all works within 100 metres of a shelter on the North Calder Water at Caldercruix, and for all works on the south shore of Hillend Reservoir where disturbance is likely to take place. The details of any licence requirements will be agreed with SNH and Scottish Executive.

**Water Vole**

The watercourses checked for Otter were also checked for signs of Water Vole. The methodology adopted was that outlined in Water Vole: Strachan R (1998). Water Vole Conservation Handbook. English Nature et al.

The survey recorded no signs of Water Vole on the sections of water checked. However it is known that Water Vole have been recently recorded (2001) on the Bogburn Flood Lagoons, less than 1km SE of the track at Bathgate. The location of the three records are: NS 980675; NS 975677 and NS 975680. Their proximity to the rail-link means that nearby watercourses, such as the Bathgate Burn and Boghead Burn, must be protected from pollution during construction.
The conclusion is that there are no obligations over the majority of the route, but care must be taken not to compromise populations at Bogburn. SNH have on-going and more comprehensive Water Vole Surveys in hand, a report is to be published in 2006, and should be consulted once this data is available to ensure that no new issues have arisen.

10.2.3 Evaluation of Recorded Interest

10.2.3.1 Biodiversity Interest

Under the Nature Conservation (Scotland Act) 2004 every public body has an obligation to conserve biodiversity whilst exercising their functions including the habitats and species listed below in Table 10.6.

Table 10.6 identifies the known interest on the route according to the UKBAP, NRRBAPS, WLBAP, FABAP and NLBAP. Only key habitats and those species in the Short List of the UKBAP are listed.

**Table 10.6 Biodiversity Summary**

<table>
<thead>
<tr>
<th>Habitats</th>
<th>UKBAP</th>
<th>NRRBAPS</th>
<th>LBAPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet woodland</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Raised Bog</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Blanket Bog</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Fens</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Field margins</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Eutrophic standing open water</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Broad-leaved woodland</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Rivers, streams and lochs</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Lowland dry acid grassland</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutral grassland</td>
<td>+</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Bings</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Species</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Oxeye Daisy</td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Ragged Robin</td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Badger</td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>European Otter</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Water Vole</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Linnet</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Reed Bunting</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Skylark</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Song Thrush</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Yellowhammer</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

10.2.3.2 Importance of known nature conservation interest

Table 10.7 brings together all known nature conservation interest within the proposed development and evaluates it in terms of its importance using the criteria outlined below.
Level of Importance

- International Importance
  - Special Protection Area
  - Special Area of Conservation
  - Ramsar Site
  - Site containing internationally rare species

- National Importance
  - National Nature Reserve
  - Site containing nationally rare species
  - Red List Bird species of High Nature Conservation Concern

- Regional Importance
  - Sites of Special Scientific Interest (SSSIs)
  - Site containing regionally rare or scarce species

- Local Importance-High Value
  - Sites of Importance for Nature Conservation (SINCs)
  - Large species diversity
  - Large populations of a single notable species
  - Mosaic of habitats within a single site
  - Locally rare or scarce species
  - Protected plant species present

- Local importance-Moderate Value
  - Diverse site not meeting criteria for Local Importance-High Value

- Local Importance-Low Value
  - Low conservation value reflecting area or site with few individuals, species or habitats. Broadly homogeneous areas not meeting criteria for Local Importance-Moderate Value

Table 10.7 Importance of Known nature Conservation Interest

<table>
<thead>
<tr>
<th></th>
<th>International</th>
<th>National</th>
<th>Regional</th>
<th>Local</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sites</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firth of Forth SPA</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Loch Moss SAC</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blawthorn Moss SAC</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caldercrux SINC</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Hillend Reservoir SINC</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Raiziehill Moss SINC</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><strong>Habitats</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet woodland</td>
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<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raised bog</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blanket bog</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Fens</td>
<td>+</td>
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<tr>
<td>Field margins</td>
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<tr>
<td>Eutrophic standing open water</td>
<td>+</td>
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<td></td>
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<tr>
<td>Broad-leaved woodland</td>
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<td>+</td>
</tr>
<tr>
<td>Rivers, streams and lochs</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowland dry acid grassland</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutral grassland</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
</tbody>
</table>
### 10.3 Assessment of Impacts

#### 10.3.1 Impact Assessment Criteria

An assessment of impacts on ecology and nature conservation requires consideration of the relative value of a site and a judgement as to the severity of any impact on the site.

**Assessment of Severity of Effect**

Effects have been based on the following criteria:

- **Severe**: Loss or complete change to an entire site
- **Moderate**: Loss or complete change to part of the site, or minor change over an entire site
- **Slight**: Minor change to part of a site, or loss of a relatively small proportion of a large site
- **Negligible**: Minor change to a small proportion of the site

**Overall Level of Impact**

The overall level of impact has been based on the above site importance and severity of effect criteria, which have been integrated into an Impact Matrix (See Table 10.8). The assessment of impact requires consideration of construction as well as operational phases. In this respect change can include disturbance arising from noise impacts.

---

Table 10.7 continued

<table>
<thead>
<tr>
<th>Species</th>
<th>International</th>
<th>National</th>
<th>Regional</th>
<th>Local</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bings</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Broad-leaved Helleborine</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Oxeye Daisy</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Ragged Robin</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Japanese Knotweed</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Badger</td>
<td>+</td>
<td>+</td>
<td>+</td>
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</tr>
<tr>
<td>European Otter</td>
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<td>+</td>
</tr>
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<td>Water Vole</td>
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</tr>
<tr>
<td>House Sparrow</td>
<td></td>
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</tr>
<tr>
<td>Linnet</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Reed Bunting</td>
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<tr>
<td>Skylark</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Song Thrush</td>
<td>+</td>
<td></td>
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<td>+</td>
</tr>
<tr>
<td>Starling</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>
Table 10.8 Ecology & Nature Conservation matrix: Guide to impacts

<table>
<thead>
<tr>
<th>Severity of Effect</th>
<th>Site Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>International</td>
</tr>
<tr>
<td>Severe</td>
<td>Extremely severe</td>
</tr>
<tr>
<td>Moderate</td>
<td>Very Severe</td>
</tr>
<tr>
<td>Slight</td>
<td>Severe</td>
</tr>
<tr>
<td>Negligible</td>
<td>Slight-Moderate</td>
</tr>
</tbody>
</table>

10.4 Potential Impacts

### 10.4.1 Impacts on Designated Sites of International or National Importance

The Firth of Forth SPA is some 14 kilometres to the north of the route and is fed by a number of tributaries, one of which, the River Almond, receives water from areas adjacent to the proposed railway. At its closest point the River Almond is approximately two kilometres from the rail route, near Whitburn, and from this point its flows some 30 kilometres to its confluence with the Firth of Forth at Cramond, near Edinburgh. Whilst it is possible that a construction pollution incident could find its way into the River Almond, it is extremely unlikely to have any significant effect on the extensive mudflats at Cramond that support prey populations for SPA qualifying migratory bird species, the rationale being the volume of dilution afforded by the River Almond and the further effect of inter-tidal dilution and dispersal within the River Forth. The scale of incident required to have any impact would be enormous and outwith the type of potential incident likely to arise from railway construction works. It is therefore unlikely that the project will have any significant affect on the integrity of the SPA and an Appropriate Assessment is therefore unnecessary.

Black Loch Moss SAC is 3 km north of the route whilst Blawthorn Moss SAC is 1km north of the route. Both are elevated above the height of the route and therefore topographically isolated and without contiguous hydrology. East Kirkton Quarry is a geological site 2 km NE of the route and again will not be impacted, not least because there is the town of Bathgate between it and the rail route. There are therefore unlikely to be any impacts on sites of international importance and no need for an appropriate assessment.

### 10.4.2 Impacts on Designated or Proposed Sites of Regional Importance

There will be no direct impacts on any of the remaining six SSSIs, all are more than 2.5km from the route. Indirect impacts are also unlikely as none have apparent hydrological links. There are unlikely to be any impacts on sites of Regional Importance.

### 10.4.3 Impacts on Sites of Local Importance - High Value

There are three SINCs that will be directly impacted by the works and all are considered to be of Local Importance - High Value. They are Caldercrux SINC, Raiziehill Moss SINC and Hillend Reservoir SINC.
Caldercruix SINC is a former paper mill waste site comprising five lagoons and associated scrub, ruderal and grassland habitats. Only one lagoon, the westmost, holds substantial water. Three lagoons and associated habitats will be lost to a new rail station. The crossing of the North Calder Water by a new access road to the station will result in the loss of poor semi-improved grassland and may impact on Otter using the river. The issue of the loss of the SINC was the subject of a site meeting with North Lanarkshire Council and is the subject of on-going consultations. The SINC is a contaminated site and there may be a requirement to de-contaminate the westmost two lagoons, however the need has yet to be demonstrated and is not included in this assessment.

Raiziehill Moss SINC is bisected by the railway and the new cyclepath path, which combines as a 5.5m wide farm track on the Redburn Quarry to Mosshouse Farm section. The new provision will be placed on the south side of the line adjacent to the existing track. New cycle and pedestrian access arrangements at Blackridge will see the loss of wetland habitat within the SINC. The result is a loss of some 0.2km$^2$ of the Raiziehill Moss SINC.

New access and fishing arrangements at Hillend Reservoir will result in a range of works that will include three sections of reservoir land claim 5m wide, a new cyclepath between the shore and exiting route and two new access bridges. These works will impact on a known Otter rest area and a shoreline used by feeding Otter. Habitat losses will be mainly bracken, ruderals and scrub together with small linear stands of emergent vegetation, primarily Reed Canary Grass.

10.4.4 Impacts on Sites of Local Importance - Moderate Value

Along the former railway line various unimproved and semi-improved grasslands have succeeded and in turn have been invaded by scrub. These are important for birds and butterflies and the aim should be to retain as much as possible. There are three ponds along the line and these may be lost and should be replaced, as standing open water is both a UK and LBAP priority habitat.

10.4.5 Impacts on Sites of Local Importance - Low Value

Sections of embankment will be either lost or disturbed that have the locally important plants such as Broad-leaved Helleborine, Oxeye Daisy and Ragged Robin.

10.4.6 Impacts on Priority Biodiversity Habitats

Biodiversity priority habitats cover much of the proposed rail route and minimisation of losses during construction is a duty under the Nature Conservation (Scotland) Act 2004.

10.4.7 Impacts on Priority Biodiversity Species

- Local, probably temporary, plant losses will result from works.
- Badger movements may be restricted.
- Otter will be impacted at Hillend Reservoir and on the North Calder Water at Caldercruix.
- The new cyclepath route at Bedlormie Toll on the A89 will result in the loss of part of a good stand of Gorse used by breeding Linnet.
10.4.8 Impacts on Protected Species

- Otter, a European Protected Species will be impacted, see biodiversity impacts.
- Badger, a UK Protected Species may be impacted, see biodiversity impacts.

10.4.9 Other

The issue of Canada Geese striking overhead lines at Hillend Reservoir is not considered to be a significant issue. The scrub between the line and reservoir would act in way that would lift birds over lines. Further tree planting between the line and the Reservoir would maximise the effect in the longer term.

10.5 Mitigation Measures

In order to minimise impacts, the following principles will be adopted:

- avoid, where possible, adversely affecting areas of conservation value;
- minimise the impacts of the proposals where sites of value cannot be avoided by the proposals;
- mitigate any unavoidable impacts by creating new areas of habitat as part of the landscape proposals; and
- where possible, manage future habitats to maximise their biodiversity potential.

These principles are part of the following documents:

**Network Rail Regional Biodiversity Action Plan**

The Network Rail Regional Biodiversity Action Plan (V1 2002) contains a substantial regional plan for Scotland and is delivered through Habitat and Species Action Sheets. These habitat and species sub-plans cover all priority habitats and species in both national and local Biodiversity Action Plans. In addition to these sheets there are Activity Sheets that identify the priority habitats and interest and advise on best practice in terms of line management and construction impacts. Network Rail has a biodiversity document that will provide specific guidance to all contractors involved in construction during development and should substantially minimise impacts.

**Draft Code of Construction Practice**

The Network Rail Biodiversity Action Plan (V1 2002) has been underpinned by a Draft Airdrie-Bathgate Waverley Code of Construction Practice (January 2006) which identifies best practice for the construction phase and incorporates extensive environmental protection measures for sites, habitats and species.

**Lineside Vegetation Management Specification**

Network Rail have a Specification for the Management of Lineside Vegetation and this will be followed once the rail-link has been established. It is a standard document that balances biodiversity with management for safety reasons.

10.5.1 Non-statutory Sites: SINCs

- Swamp and marginal vegetation loss impacts on Hillend Reservoir can be partly mitigated by transplanting native emergent vegetation.
• There is no available mitigation for the loss of a small section of Raiziehill Moss. The routing of the cyclepath and farm access road alongside the existing disused line has helped minimise adverse effects by avoiding further fragmentation.

• The Caldercruix losses are extensive and the following mitigation has been proposed North Lanarkshire Council:
  − Retain as much of the original habitat as possible, especially along the escarpment between the lagoons and the North Calder Water;
  − Two artificial Otter holts to be constructed on the North Calder Water;
  − Otter fencing to prevent casualties on the access road and around the car park;
  − An Otter pass under the access road bridge over the North Calder Water;
  − Wildlife friendly SUDs in the low-lying field to the south-east of the access road;
  − Restrictions in the use of white light at dawn and dusk to avoid disturbing Otter;
  − New riparian planting to offset scrub losses; and
  − Final design must seek, if practical, to retain western lagoon and the sluice ponds beside the river.

10.5.2 Protected Species

JDC Ecology recommended badger mitigation will be agreed with SNH in order to avoid any significant effects. Measures will include underpasses and fencing, as appropriate.

As a precautionary measure, a pre-construction Bat survey should be undertaken, between April and October in the season preceding the start of works. The methodology should follow that used in the August 2005 bat survey. Any section with signs of bat residence may require mitigation and an appropriate SEERAD licence before work can commence.

Otter using the North Calder Water should not be directly affected if an Otter underpass is built into the access road to the Caldercruix Station, site lighting at dusk and dawn is controlled and the watercourse is protected from pollution during construction.

Works at Hillend Reservoir will result in a local loss of cover and a rest area, as well as disruption to normal feeding movements. It is suggested that an artificial Otter holt is constructed near the gatehouse to compensate for the loss of the rest area. Adverse effects will be short term and related to construction phases and long term effects should be minimal.

Emergency procedures, dealing with procedures for reporting and dealing with protected species, will be detailed in the final draft of the Code of Construction Practice.

10.5.3 Minimisation of Effects on Flora and Fauna

The best mitigation for flora and fauna is to retain as much of the existing habitats as possible. These are established habitats adapted to the local environment and their retention is cost-effective in terms of landscape. The general principles outlined below should help to minimise the adverse effects:
• All scrub clearance to be undertaken outwith the bird breeding season, July-March;

• After clearance of scrub JDC Ecology require access to survey previously inaccessible areas of dense scrub;

• Ensure that the construction method statements are written to minimise working widths and to maximise potential for habitat reinstatement;

• Where practical retain all scrub and trees;

• In landscape provision create topographically varied verges and embankments; and

• Create three new ponds near Standhill Farm, around NS 895667, to replace the local ponds on the line used by Palmate Newt.

10.5.4 Habitat Creation

The narrowness of the route does not allow great scope in terms of large-scale habitat creation and in order to maximise the benefits for wildlife the following recommendations should be implemented:

• Close liaison between the Landscape Architect and an appointed ecologist to maximise the biodiversity benefits during reinstatement and longer term management by completing a Habitat and Landscape Action Plan prior to commencement of works. This plan is an SNH recommendation;

• When planting trees or scrub then the aim will be to maximise the area planted to enhance attractiveness to birds;

• Ensure that all tree stock is native and, where possible, is of local seed provenance;

• When selecting a seed mix for any sowing, ensure that it is compatible with the local soils and NVC communities present before commencement of the works; and

• Alternatives to sowing include a non-intervention option that would allow natural re-colonisation from local seed sources. In ecological terms this is the best option but may not be acceptable in some areas, given visual, landscape, erosion potential and other constraints.

North Lanarkshire Council have made a number of positive suggestions, which have generally been covered in different sections. They should be consulted further on these suggestions at the time of finalising the Habitat and Landscape Plan and whilst writing Method Statements.

10.5.5 Mitigation of Construction Activities

During the construction period the following requirements are recommended:

• All contractors must be made aware of protected species and biodiversity obligations and be required to demonstrate measures to minimise biodiversity impact, particularly regarding construction works in and around SINCs. This
should be in accordance with the Draft Code of Construction Practice, Babtie 2006.

- In order to maximise the biodiversity benefits construction contractors must be familiar with the comprehensive NRRBAPS as this implements current Network Rail national policy at the local level.

- An ecologist should be contracted on a watching brief to:
  1. Review construction method statements;
  2. Advise on protected species, areas of sensitivity e.g. SINCs;
  3. Ensure that pre-construction surveys are completed; and
  4. During construction, to ensure that contractors comply with legal obligations, method statements and recommended mitigation measures by monitoring site works on sensitive sites.

### 10.6 Residual Effects

Assuming the foregoing mitigation, the matrix below (Table 10.9) summarises the overall effects on flora and fauna.
### Table 10.9 Residual Impact Summary Matrix

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
<th>Effects</th>
<th>Mitigation/ Enhancement</th>
<th>Residual Impact Magnitude</th>
<th>Residual Level of Impact</th>
</tr>
</thead>
</table>
| 1. SINCs and Wildlife Sites              | Local Importance - High Value | Significant loss of habitat at Caldercruix SINC  
Small-scale losses of habitat at Raiziehill Moss SINC  
Small scale losses of habitat at Hillend Reservoir | Consultation with NLC  
None available  
Write a local swamp and marginal plant habitat creation plan | Moderate                     | Moderate                                |
| 2. Local sites habitats of moderate value | Local Importance - High Value | Loss of scrub habitat, ponds, wetland and neutral grassland habitat | Retain as much of each habitat as possible and create three new ponds to replace ponds lost to the scheme | Slight                     | Slight                   |
| 3. Local sites of low value              | Local Importance - Low Value | Loss of Broad-leaved Helleborine | Translocate to a suitable safe locality on the route | Negligible                  | Negligible                |
| 4. Priority biodiversity habitats        | Local Importance - High Value | Loss of scrub, ponds, wetland and neutral grassland habitat | Write a Habitat and landscape plan  
Ensure compliance Draft Code of Construction Practice  
Create three new ponds to replace ponds lost to the scheme  
Like-for-like replacement of lost habitats as part of landscape proposals | Slight                     | Negligible-slight                       |
| 5. Priority biodiversity species         | Local Importance - High Value | A wide range of species will be lost, at least temporarily  
Loss of part of breeding site for Linnet at Bedlormie Toll | Ensure compliance with Draft Code of Construction Practice  
Like-for-like replacement of area of all habitats lost | Negligible                  | Negligible-slight                       |
| 6. Protected species, Badger             | National       | Possible disruption of movements | Mitigation as recommended by JDC Ecology and agreed with SNH | Negligible                  | Slight                   |
| 7. Protected species, Otter              | International  | Loss of rest areas at Caldercruix and Hillend Reservoir  
Disturbance at Caldercruix and Hillend Reservoir | Provide artificial holts at both sites  
Minimise lighting at dawn and dusk. Implement NLC recommended mitigation at Caldercruix | Negligible                  | Slight-Moderate           |
10.7 Introduction

The proposals for the electrification of the existing railway line between Bathgate and Edinburgh was added in September 2005 and the assessment is based on comprehensive desk-top data provided by the Lothian Wildlife Information Centre (LWIC), see Appendix 4E, and specialist reviews. The line between Bathgate and Edinburgh is an active main line and all works will be contained within the existing solum.

This section also takes into account written comments from City of Edinburgh Council and West Lothian Council.

10.8 Baseline Conditions

Extensive data is available for a 500m corridor along the route and includes:

- Plans showing SSSIs, SWT Local Wildlife Sites (LWS), and CEC Urban Wildlife Sites (UWS) and SINCs;
- Plans showing Phase 1 Habitat Survey and Target Note locations;
- Plans showing Ancient Woodland Inventory sites;
- A list of Target Note descriptions;
- A list of Notable/Protected species records (The Badger records are confidential and have been omitted but are available if required by statutory authorities.);
- Bat Survey July 2005, Haymarket and Waverley Stations, BMT Cordah Ltd;
- Assessment of likely use by bats of the main railway tunnel between Waverley and Haymarket, Edinburgh (Part 1), December 2005. S. Pritchard, Report to Ironside Farrar; and
- A review of LWIC Badger data by JDC Ecology.

10.8.1 Sites

Within the 250m corridor are:

- Tailend Moss SSSI/SWT Nature Reserve
- Roman Camp Meadows LWS
- River Almond SINC
- Gogar Burn SINC
- Arthur’s Seat Volcano SSSI
- Several adjacent stands of both ancient woodland and long-established woodland of plantation origin.

10.8.2 Habitats

The dominant habitats along the 500m corridor are:

A1.1.2 Woodland, broad-leaved, plantation
A1.2.2 Woodland, coniferous, plantation
A1.3.2 Woodland, mixed, plantation
A2.1 Scrub, dense
B1.2 Grassland, acid, semi-improved
B2.2 Grassland, neutral, semi-improved
B4 Grassland, improved
C3.1 Tall ruderal
E1.6 Raised bog
I2.2 Artificial spoil
J1.1 Arable land

These habitats reflect the intensive land-use, both urban and rural. The raised bog at Tailend Moss represents the only natural habitat within the corridor. Suitable sections of the railway embankment have been mapped and show frequent scrub and occasional semi-improved neutral grassland and tall ruderals.

10.8.3 Species

The habitat survey target notes TN398, TN315, TN304, TN296, TN151 highlight local interest but no notable or protected species. The notable and protected species list identifies a wide range of flora and fauna but none on the line itself. The Waverley and Haymarket Tunnels are not known to hold any notable flora and fauna, but as a precaution a bat assessment was commissioned and reported.

Great Crested Newts and Bats are European protected species whilst Badger are a UK protected species.

Great Crested Newt

- Adjacent to the line are two known breeding sites for Great Crested Newts at Uphall Station (NT066704) and Drumshoreland Muir (NT083698). Uphall Station Reservoir is 300m south of the line and 100m east of Uphall Station. The Drumshoreland site is 800m south of the line in a plantation. A third site, Roman Camp (701706), lies alongside the south side of the line but has no recent breeding record. It must considered still to be viable, be protected from disturbance and should be surveyed prior to commencing works.

Bats

A Mound Tunnel bat report was prepared by Stewart Pritchard in December 2005, (see Appendix 4H) and is summarised below.

- Existing bat records were collated, showing few records for central Edinburgh, only the two Pipstrelle Bat species, and no records for Waverley Station. Haymarket and Waverley Stations were surveyed for bats by BMT Cordah Ltd in July 2005 and they found no evidence of any use by bats.
- A review of the use of tunnels by bats found only a few species that use them and only under certain conditions. The environmental conditions in the Mound Tunnel are likely to be unsuitable and the species that use tunnels are not found in Edinburgh.
- The conclusion was that the tunnel area is unfavourable for bats, none have been recorded using the tunnel or immediate surrounding area and consequently the risk of disturbing or causing damage to bats or bat roosts is very low.

Badger

- Twenty Badger records are provided and these cover twelve locations adjacent to the line. This species appears to be co-existing with current operation of the
line without adverse effects and, on the basis of available desk-top data, JDC Ecology suggest that there may be no significant impacts on Badger.

10.9 Summary Evaluation of Known Interest

Table 10.11 below summarises the sites and species data for the 500m corridor.

Table 10.11 Importance of Known Nature Conservation Interest

<table>
<thead>
<tr>
<th>Sites</th>
<th>International</th>
<th>National</th>
<th>Regional</th>
<th>Local*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthur's Seat Volcano SSSI</td>
<td>+</td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Tailend Moss SSSI/ SWT Reserve</td>
<td>+</td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Roman Camp Meadows LWS</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>River Almond SINC</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Gogar Burn SINC</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Habitats</th>
<th>National</th>
<th>Regional</th>
<th>Local*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raised bog</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Farmland</td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Semi-natural grassland</td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Wildlife corridors</td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Woodland</td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Rivers and streams</td>
<td></td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>National</th>
<th>Regional</th>
<th>Local*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japanese Knotweed</td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Common Frog</td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Bullfinch</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Grey Partridge</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Kingfisher</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Linnet</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Reed Bunting</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Skylark</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Song Thrush</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Great Crested Newt</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>European Otter</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Badger</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Water Vole</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Brown Hare</td>
<td></td>
<td></td>
<td>+</td>
</tr>
</tbody>
</table>

*As identified as priority habitat or species in the Edinburgh Biodiversity Action Plan (EBAP) and West Lothian Local Biodiversity Action Plan (WLLBAP).

10.10 Assessment of Impacts

10.10.1 Environmental Objectives

The main objectives, in terms of impacts on ecology and nature conservation, should be:

- to avoid, where possible, adversely affecting areas of conservation value;
- to minimise the impacts of the proposals where sites of value cannot be avoided by the proposals;
to mitigate any unavoidable impacts by creating new areas of habitat as part of the landscape proposals; and

where possible, manage future habitats to maximise their biodiversity potential.

10.10.2 Impact Assessment Criteria

An assessment of impacts on ecology and nature conservation requires consideration of the relative value of a site and a judgement as to the severity of any impact on the site.

Assessment of Severity of Effect

Effects have been based on the following criteria:

Severe  Loss or complete change to an entire site

Moderate Loss or complete change to part of the site, or minor change over an entire site

Slight Minor change to part of a site, or loss of a relatively small proportion of a large site

Negligible Minor change to a small proportion of the site

Overall Level of Impact

The overall level of impact has been based on the above site importance and severity of effect criteria, which have been integrated into an Impact Matrix (See Table 10.12 below). The assessment of impact requires consideration of construction as well as operational phases. In this respect change can include disturbance arising from noise impacts.

Table 10.12 Ecology & Nature Conservation matrix: Guide to impacts

<table>
<thead>
<tr>
<th>Severity of Effect</th>
<th>Site Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>International</td>
</tr>
<tr>
<td>Severe</td>
<td>Extremely severe</td>
</tr>
<tr>
<td>Moderate</td>
<td>Very Severe</td>
</tr>
<tr>
<td>Slight</td>
<td>Severe</td>
</tr>
<tr>
<td>Negligible</td>
<td>Slight-Moderate</td>
</tr>
</tbody>
</table>

10.11 Potential Impacts

1 Impacts on Designated Sites of International or National Importance

For the section between Bathgate and Edinburgh the Firth of Forth SPA is some 8 kilometres to the north of the route at it nearest point and is fed by a number of tributaries, one of which, the River Almond, receives water from areas adjacent to the proposed railway. The electrification of the line will have no direct effects on the Firth of Forth Special Protection Area (SPA) and potential indirect effects are not considered to be a threat. There are no major earthworks and possible sedimentation problems in tributaries of the Forth should not be an issue. There is a
risk of pollution tributaries, notably the River Almond, however there is only one crossing at Birdsmill Viaduct south of Newbridge and if care is taken to ensure no discharges due to works there should be no adverse effects. There are no known sites of international or national importance likely to be adversely affected by the electrification of the line and therefore, in accordance with SO June 2000, there is no need for an appropriate assessment.

2 Impacts on Designated or Proposed Sites of Regional Importance

Tailend Moss SSSI is the most sensitive site, lying adjacent to the line it could be adversely affected by drainage, material storage or access. It is unlikely that there would be adverse effects on Arthur’s Seat Volcano SSSI.

3 Impacts on Sites of Local Importance-High Value

There are two SINCs and one LWS that could be affected by the works.

4 Impacts on Sites of Local Importance-Moderate Value

The existing solum will be used for works and no local losses should occur.

5 Impacts on Sites of Local Importance-Low Value

Along some sections there will be local losses of semi-improved neutral grassland and scrub on the railway embankments.

6 Impacts on Priority Biodiversity Habitats

The Habitat Action Plans in the WLLBAP and EBAP are very broad and cover all the habitats found along the route.

7 Impacts on Priority Biodiversity Species

The construction process should not adversely affect biodiversity species, but a few breeding birds that use scrub, rivers and streams and grasslands could temporarily be disturbed.

8 Impacts on Protected species

Works could impact on one potential Great Crested Newt Breeding site at Roman Camp, whilst two other confirmed breeding sites are of sufficient distance not be impacted.

Works during electrification could affect Bats, but bridges are well maintained and unlikely to be of importance for roosting bats.

There could be adverse effects on known local Badger populations but the nature and significance of the effects will only be accurately determined after a new field survey.

Any activity affecting water quality in the Lochshot Burn, Tailend Moss could adversely affect Water Vole on this watercourse.

10.12 Mitigation Measures

The Network Rail Regional Biodiversity Action Plan (V1 2002) contains a substantial regional plan for Scotland and is delivered through Habitat and Species Action Sheets. These habitat and species sub-plans cover all priority habitats and species in both national and local Biodiversity Action Plans. In addition to these sheets, there
are Activity Sheets that identify the priority habitats and interest and advise on best practice in terms of line management and construction impacts. Network Rail has a biodiversity document that will provide specific guidance to all contractors involved in construction during development, which should substantially minimise impacts. These biodiversity actions and activity sheets should form part of any contractors’ method statements, whether working on the new railway line or building new sections of the proposed new cyclepath. The Draft Code of Construction Practice (Babtie 2006) already deals with this best practice.

10.12.1 Sites

Ensure that any infrastructure, construction material storage or construction access does not impact on the statutory and non-statutory designated sites. All sites must be protected from indirect effects such changes to drainage or line maintenance.

10.12.2 Protected Species

*Great Crested Newts*

Protect the Drumshoreland and Roman Camp sites by:

- Re-surveying the site prior to commencing works;
- Erecting high visibility fencing around the pond before works commence;
- Isolating the pond from any surface water, or other water, arising from works; and
- Ensuring that all contractors are aware of the importance of the site in supporting a highly protected species.

*Bats*

Ensure that a bat expert is available to advise should bats be found in any structures between Bathgate and Waverley.

*Water Vole*

Water Vole have been recorded from Lochshot Burn, Tailend Moss. Whilst there are no direct effects, this watercourse must be protected from any indirect effects e.g. uncontrolled discharges or other pollution incidents affecting the sustainability of the Water Vole population.

*Badger*

A data review by JDC Ecology advises that:

- Badger are present along the existing corridor and lineside features;
- Potential impacts include the possibility of direct impact to setts and indirect proximity disturbance; and
- A Badger survey is undertaken prior to commencement of works to provide an accurate picture of likely impacts and to advise on accurate mitigation.

The operation of the existing line does not appear to significantly conflict with the local Badger population and therefore mitigation should a question of ensuring no damage to setts, identified during the new survey, during construction nor any disruption of movements due to new lineside structures and fencing.
**All species**

Ensure that all project managers are aware of the locations of all protected species and the legal requirements and criteria for a protected species licence.

### 10.12.3 Minimisation of effects on flora and fauna

The best mitigation for flora and fauna is to retain as much of the existing habitats as possible. These are established habitats adapted to the local environment and their retention is cost-effective in terms of landscape. The general principles outlined below should help to minimise the adverse effects to disturbed areas:

- Ensure that the construction method statements are written to minimise working widths and to maximise potential for habitat reinstatement;
- Where practical retain all grassland, scrub and trees; and
- Ensure that any reinstatement plans include biodiversity as one priority.

### 10.12.4 Habitat creation

- Any habitat creation should seek to replace the habitat(s) present prior to works.

### 10.12.5 Mitigation of construction activities

- All contractors must be made aware of biodiversity obligations and be required to demonstrate measures to minimise biodiversity impact.
- In order to maximise the biodiversity benefits, a Site Biodiversity Action Plan should be written to ensure best practice management of the rail and cyclepaths for its flora and fauna. This would be based on the comprehensive NRRBAPS and would implement current Network Rail national policy at the local level.
- An ecologist should be contracted on a watching brief to review Method Statements, advise on areas of sensitivity e.g. SINCs and protected species. The ecologist could also help to provide ecological restoration briefs for landscape reinstatement.

### 10.13 Residual Effects

Assuming the foregoing mitigation, the matrix overleaf (table 10.13) summarises the overall effects on flora and fauna, where the available data allows the effects to be assessed.
### Table 10.13. Impact Summary Matrix

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
<th>Effects</th>
<th>Mitigation/ Enhancement</th>
<th>Residual Impact Magnitude</th>
<th>Residual Level of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tailend Moss SSSI/SWT Reserve</td>
<td>Regional Importance</td>
<td>Potential changes in drainage arising from works</td>
<td>Ensure no direct impacts on the site; Protect the site from any hydrological effects</td>
<td>Negligible</td>
<td>Slight</td>
</tr>
<tr>
<td>SINCs and Wildlife Sites</td>
<td>Local Importance - High Value</td>
<td>None identified</td>
<td>Ensure implementation of mitigation</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Local sites with habitats of moderate value</td>
<td>Local Importance - High Value</td>
<td>No residual effects</td>
<td>Ensure implementation of mitigation</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Local sites of low value</td>
<td>Local Importance - High Value</td>
<td>Local loss of scrub habitat, and neutral grassland habitat</td>
<td>Retain as much of each habitat as possible; Reinstate damaged areas of habitat</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Priority biodiversity habitats</td>
<td>Local Importance - High Value</td>
<td>Loss of scrub, and neutral grassland habitat</td>
<td>Write Site Biodiversity Action Plan; Retain as much of each habitat as possible; Reinstate damaged areas of habitat</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Priority biodiversity species</td>
<td>Local Importance - High Value</td>
<td>Loss of some bird breeding habitat</td>
<td>Write Site Biodiversity Action Plan; Clear all scrub before the start of breeding season</td>
<td>Negligible</td>
<td>Negligible</td>
</tr>
<tr>
<td>Great Crested Newt</td>
<td>International</td>
<td>Potential damage to Roman Camp breeding site</td>
<td>Ensure full implementation of mitigation to protect site</td>
<td>Negligible</td>
<td>Slight-moderate</td>
</tr>
<tr>
<td>Protected species, Bats</td>
<td>International</td>
<td>Potential disturbance and damage to bats</td>
<td>Ensure a bat experts is available to advise, if required.</td>
<td>Likely to be negligible</td>
<td>Likely to be slight</td>
</tr>
<tr>
<td>Protected species, Water Vole</td>
<td>National</td>
<td>Potential damage to Lochshot Burn</td>
<td>Ensure that the watercourse is protected from all activities adversely affecting water quality</td>
<td>Negligible</td>
<td>Slight</td>
</tr>
</tbody>
</table>
### Table 10.13 continued

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
<th>Effects</th>
<th>Mitigation/Enhancement</th>
<th>Residual Impact Magnitude</th>
<th>Residual Level of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Badger</td>
<td>National</td>
<td>Potential damage to setts and disruption of movements</td>
<td>A Badger survey is required to advise on mitigation likely to avoid direct effects on setts and disruption to movements. Survey should be carried out within six months prior to the commencement of works.</td>
<td>To be determined (Likely to be Negligible)</td>
<td>To be determined (Likely to be Slight)</td>
</tr>
</tbody>
</table>