7 Ecology and Nature Conservation

7.1 Introduction

7.1.1 This chapter considers the potential effects of the proposed development on fauna and flora, in particular on sites designated for their nature conservation value and on protected and/or notable species and habitats.

7.1.2 A description of the site and surrounding area can be found in ES Chapter 4 and a full description of the proposed EfW CHP Facility can be found in Chapter 6.

7.2 Legislation and Policy Context

7.2.1 The ecological assessment has taken into account legislation, policy and guidance as documented below.

Legislation

The Conservation of Habitats and Species Regulations, 2010

7.2.2 The Conservation of Habitats and Species Regulations (2010) consolidate all the various amendments made to the Conservation (Natural Habitats & c.) Regulations (1994) in respect of England and Wales. The Regulations transpose Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law. The Regulations provide for the designation and protection of 'European Sites', the protection of 'European Protected Species', and the adaptation of planning and other controls for the protection of European Sites.

The Wildlife and Countryside (WCA) Act, 1981 (as amended)

7.2.3 The Wildlife and Countryside Act (1981) (as amended) consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC (EC Birds Directive) (and its replacement 2009/147/EC).

The Countryside & Rights of Way (CRoW) Act, 2000

7.2.4 The CRoW Act (2000) strengthened the provisions of the WCA (1981) (as amended) in several key areas:

- strengthening of SSSI protection;
- the inclusion of ‘reckless’ in addition to the ‘intentional’ nature of offences listed within parts of the Wildlife and Countryside Act (1981) (as amended); and,
- a further requirement on the Government to have regard for biodiversity and to take positive steps to further the conservation of species and habitats listed in the Convention on Biological Diversity.

Natural Environmental and Rural Communities (NERC) Act, 2006

7.2.5 The NERC Act (2006) places a requirement on all public bodies to have regard for biodiversity and tasks the Government to take positive steps to further the conservation of species and habitats listed in the Convention on Biological Diversity.

The Hedgerows Regulations, 1997

7.2.6 Under the Hedgerows Regulations (1997) it is against the law to remove or destroy certain hedgerows without permission from the local planning authority. Hedgerows that are at least 20 metres in length, more than 30 years old and contain certain combinations of species or features (as specified within the Regulations) are considered as 'Important Hedgerows' under the Regulations.

National Policy

Planning Policy Statement (PPS) 9: Biodiversity and Geological Conservation

7.2.7 PPS9 (Office of the Deputy Prime Minister (ODPM), 2005a) and the accompanying explanatory notes provided in Government Circular 06/05 (ODPM, 2005b) set out planning policies on the protection of biodiversity and geological conservation. Circular 06/05 highlights that *"development proposals provide many opportunities for building-in beneficial biodiversity … as part of good design. When considering such proposals, local planning authorities should maximise such opportunities in and around developments"*.

7.2.8 The Government's objectives are:

"***to promote sustainable development****: ensuring that biological and geological diversity are conserved and enhanced as an integral part of social, environmental and economic development, so that policies and decisions about the development and use of land integrate biodiversity and geological diversity with other considerations.*

to conserve, enhance and restore the diversity of England's wildlife and geology*: sustaining, and where possible improving, the quality and extent of natural habitat and geological and geomorphological sites; the natural physical processes on which they depend; and the populations of naturally occurring species which they support.*

to contribute to rural renewal and urban renaissance by*: enhancing biodiversity in green spaces and among developments so that they are used by wildlife and valued by people, recognising that healthy functional ecosystems can contribute to a better quality of life and to people's sense of well-being; and ensuring that developments take account of the role and value of biodiversity in supporting economic diversification and contributing to a high quality environment."*

7.2.9 PPS9 gives advice to Local Planning Authorities to help ensure that the potential impacts of planning decisions on biodiversity and ecological conservation are fully considered.

Regional Policy

7.2.10 The Draft Regional Spatial Strategy (RSS), prepared by the South West Regional Assembly, was submitted to the Government for approval in 2006. The following policy within the Draft RSS is considered relevant.

ENV4 Nature Conservation

7.2.11 *"The distinctive habitats and species of the South West will be maintained and enhanced in line with national targets and the South West Regional Biodiversity Action Plan. Local Authorities should use the Nature Map to help map local opportunities for biodiversity enhancement in LDDs[1], taking into account the local distribution of habitats and species, and protecting these sites and features from harmful development. Proposals which provide opportunities for the beneficial management of these areas and habitats and species generally, should be supported, including linking habitats to create more functional units which are more resilient to climate change."*

Local Policy

7.2.12 The Plymouth City Council Local Development Framework: Core Strategy Development Plan Document (the 'Core Strategy') sets out the overall planning vision and framework for the city from 2006 to 2021. Plymouth's Core Strategy was formally adopted by Full Council on 23 April 2007. Policies CS18 and CS19 of the Core Strategy relate to the natural environment.

Policy CS18 Plymouth's Green Space

7.2.13 *"The Council will protect and support a diverse and multi-functional network of green space and waterscape, through:*

1. *Identifying in the Site Allocations Development Plan Document and Area Action Plans a network of strategically and locally important Greenscape Areas. Development on or adjacent to these Greenscape Areas will not be permitted where it would result in unacceptable conflict with the function(s) or characteristics of that area.*
2. *Requiring development proposals to improve the quality and quantity of accessible green space, where appropriate.*
3. *Requiring development proposals to address local deficiencies in accessible green space, where appropriate.*
4. *Using its planning powers to safeguard important trees and hedgerows, and to secure provision for soft landscaping where appropriate as part of development."*

Policy CS19 Wildlife

7.2.14 *"The Council will promote effective stewardship of the city's wildlife through:*

1. *Safeguarding national and international protected sites for nature conservation from inappropriate development.*
2. *Appropriate consideration being given to European and nationally protected and important species.*
3. *Maintaining a citywide network of local wildlife sites and wildlife corridors, links and stepping stones between areas of natural green space.*
4. *Ensuring that development retains, protects and enhances features of biological or geological interest, and provides for the appropriate management of these features.*

[1] Local Development Documents

5. *Ensuring development seeks to produce a net gain in biodiversity by designing in wildlife, and ensuring any unavoidable impacts are appropriately mitigated for.*
6. *Supporting wildlife enhancements which contribute to the habitat restoration targets set out in the South West Nature Map and in National, Regional and Local Biodiversity Action Plans."*

National and Local Biodiversity Action Plans

7.2.15 Consideration has been given to both the national and local (county) Biodiversity Action Plans (BAPs). Through section 40 of the NERC Act, 2006, local planning authorities have a duty to consider habitats and species listed within the national (priority habitats and species) and local BAPs when considering a planning application.

UK BAP

7.2.16 The UK BAP aims to describe the biological diversity resources of the UK and set out a detailed plan for their conservation. It represents the UK Government's response to the Convention of Biological Diversity (1992) and seeks to guide national strategy for the conservation of biodiversity. The current biodiversity strategy for the UK is described in the publication "*Conserving Biodiversity – the UK approach*" (Department of Environment, Food and Rural Affairs, 2007).

7.2.17 As part of the UK BAP, lists of priority species and habitats have been identified and conservation targets have been established within a series of Species Action Plans (SAPs) and Habitat Action Plans (HAPs).

Devon Local BAP

7.2.18 The Devon Local BAP (2005) aims to ensure that the targets and priorities within the UK BAP are implemented at a local level for those habitats and species present in Devon. The following HAPs and SAPs are considered relevant to the proposed development:

7.2.19 HAPs:

- Oak Woodland
- Pits, Quarries and Cuttings
- Estuaries
- Rivers, Streams and Floodplains

7.2.20 SAPs:

- Primrose
- Atlantic Salmon
- Dormouse
- Greater Horseshoe Bat
- Otter
- Water Vole

7.3 Assessment Methodology

Introduction

7.3.1 This section describes the method of assessing potential ecological impacts during the construction and operational phases of the project based broadly on the descriptive methodology given in the *Guidelines for Ecological Impact Assessment in the United Kingdom* published by the Institute of Ecology and Environmental Management (IEEM) in 2006. The methodology provides a descriptive measure of the magnitude and significance of impacts on ecological baseline conditions, both on the immediate site and in the surrounding environment. Mitigation and/or compensation measures are derived from the outcomes of this assessment.

Scope of Assessment

7.3.2 The study area includes all ecological receptors which have the potential to be directly or indirectly affected by the proposed development. Direct impacts will be restricted to the area within the proposed development boundary but there may be impacts, for example acid deposition on sensitive habitats arising from chimney emissions, which could occur over a wider area.

7.3.3 The assessment compares effects with and without the development proposal. The current baseline is taken from surveys and information obtained from the desk survey and consultation undertaken during the period from September 2009 to March 2011. Future impacts are assessed at the time of construction which is expected to occur between early 2012 and late 2014, taking approximately 35 months in total. The design life of the EfW CHP facility will be 30 years, and the life expectancy of the facility is approximately 40 years. MVV has experience of operating EfW CHP facilities for periods in excess of the design life, for example MVV's Mannheim facility in Germany has now been operational for more than 45 years.

7.3.4 The following resources and receptors have been considered in this assessment:

- Statutory designated sites, on site or within 15 km of the development boundary in respect of chimney emissions-related impacts;
- Statutory and non-statutory designated sites, on site or within 2 km of the development boundary in respect of other impacts;
- Legally protected or otherwise notable species, on site or within 2 km (4 km for bats) of the development boundary; and
- Habitats or features within the site.

7.3.5 The impacts on these resources and receptors comprise loss of, or damage to, ecological resources and receptors resulting from:

- Permanent landtake;
- Temporary landtake;
- General disturbance;
- Dust deposition;
- Pollution;

- Noise and visual disturbance;
- Site lighting; and/or
- Displacement.

7.3.6 The interaction between these impacts and with other natural processes is also considered where relevant.

Significance Assessment Methodology

7.3.7 In order to determine the significance of any effects of the proposed development, it is necessary to define a robust assessment methodology. This is achieved as follows:

- The value of nature conservation resources present is identified;
- The magnitudes of the various impacts that act upon these nature conservation resources are determined (independently of the evaluation of the resource); and
- The significance of the effects of the development are determined using a standard matrix linking the previous two variables.

7.3.8 The value of each resource or receptor is considered individually and where relevant in combination with others. Impacts are discussed individually for each receptor and in combination. An overall severity value has been determined for impacts to each receptor. In general, a precautionary approach has been adopted such that the overall severity is judged to be at the level of the highest individual impact on that particular resource or receptor.

Value of Resource

7.3.9 An ecological resource is defined as a site/area of nature conservation value. Each site/area may have more than one feature of value that it supports (for example different habitats or populations and/or communities of species). Individual ecological resources and the features that comprise each resource are evaluated according to generally accepted criteria, including designation and protection status. To attain each level of value/importance, an ecological resource or one of its features should meet the criteria identified in Table 7.1. In some cases, professional judgement may be required to increase or decrease the allocation of specific value. This judgement is based on consideration of the following additional criteria:

- Population trends;
- Sustainability of resource;
- Representativeness;
- Potential for substitution/re-creation;
- Position in the ecological unit;
- Biodiversity.

7.3.10 Habitats considered by Natural England to be of national importance for nature conservation are designated as Sites of Special Scientific Interest (SSSI). There is also a range of international designations including Ramsar sites, Special Areas of Conservation (SAC) and Special Protection Areas (SPA). Wildlife areas of importance at the local level can be

designated as non-statutory Sites of Nature Conservation Importance (SNCI), County Wildlife Sites (CWS) or similar and/or as local statutory sites such as Local Nature Reserves (LNR).

Table 7.1: Resource Evaluation*

Value of Resource	Examples of Selection Criteria
Very High (International)	An internationally designated site or candidate site (SPA, SAC and/or Ramsar site). A substantial proportion (*e.g.* 1%) of the international resource of a habitat listed in Annex I of the Habitats Directive. A substantial proportion of the international resource of an internationally important species or site supporting such a species (or supplying a critical element of their habitat requirement) *e.g.*: • UK Red data book species that is listed as occurring in 15 or fewer 10 km squares in the UK that is of unfavourable conservation concern in Europe or of uncertain conservation status or global conservation concern in the UK BAP. • Species listed in Annex II of the Habitats Directive.
High (National)	A nationally designated site (SSSI, National Nature Reserve (NNR), Marine Nature Reserve) or a discrete area which meets the selection criteria for national designation (*e.g.* SSSI selection criteria). A substantial proportion (*e.g.* 1%) of the UK resource of a habitat listed in Annex I of the Habitats Directive or the UK BAP. A substantial proportion of a nationally important species or site supporting such a species (or supplying a critical element of their habitat requirement) *e.g.*: • Species listed in Schedules 5 and 8 of the WCA (1981); • Other UK Red Data Book species; • Other species listed as occurring in 15 or fewer 10km squares in the UK.
Medium – High (Regional)	Sites/populations that exceed the County-level designations but fall short of SSSI selection guidelines, including the following: • A substantial proportion of the regional resource of a UK BAP habitat or a key habitat identified in a Regional BAP; • A population of a species listed as being nationally scarce which occurs in 16-100 10km squares in the UK; • A substantial proportion of the regional population of a species listed in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation; or • Sites supporting 1% or more of a regional population.
Medium (Metropolitan / County)	Some designated sites including SNCIs, CWS, and Sites of Metropolitan Importance in London. A substantial area of habitat identified in the County BAP. Substantial populations of the following species: • Species listed in a County/Metropolitan “red data book” or BAP on account of its rarity/localisation in a County context; and/or • Sites supporting 1% or more of a county population.

Value of Resource	Examples of Selection Criteria
Low - Medium (District / Borough)	Some designated sites (LNR, Sites of Borough Importance in London). Viable areas of habitat identified in a District/Borough BAP. Sites/features that are scarce within the District/Borough or that appreciably enrich the District/Borough habitat resource. Sustainable populations of the following species: • Species listed in a District/Borough BAP on account of its rarity/localisation in a district context; or • Sites supporting 1% or more of a District/Borough population.
Low (Parish / Neighbourhood)	Sites/populations, which appreciably enrich the Parish/Neighbourhood habitat resource (for example hedgerows of medium richness).
Negligible	No significant ecological value.
Negative	Detriment to ecological value.

* Criteria should not be applied rigidly and should be tailored to the specific details of any site, species or habitat.

Magnitude of Impact

7.3.11 An 'impact' is defined as any factor which may result in a change to the existing nature conservation resource. Once impacts have been identified, their magnitude must be assessed. The criteria utilised to determine the magnitude of impact are identified in Table 7.2.

Table 7.2: Magnitude of Impacts

Magnitude of Impact	Description
Major beneficial	Where the proposed development would cause a substantial improvement / enhancement to the existing situation, such that once the proposed development is in place the situation will be fundamentally changed.
Moderate beneficial	Where the proposed development would cause an improvement / enhancement to the existing situation, such that once the proposed development is in place the situation will be partially changed.
Minor beneficial	Where the proposed development would cause a slight improvement / enhancement to the existing situation, such that once the proposed development is in place the situation will be similar to the baseline.
Neutral	Change barely perceptible. With ecological receptors it is often not possible to state categorically that there will be no impact, but this category is used when the chance of any impact is very low and if it occurs it is well below the level of detection.
Minor adverse	Where the proposed development would cause a slight loss / change to the existing situation, but once the proposed development is in place the situation will be similar to the baseline. From an ecological perspective this is defined here as: Land-take of a habitat or feature, if it occurs, affects less than 5% of the area. Where indirect impacts occur, some changes in species abundance may occur, but the impact is reversible. Full recovery is likely in the short term, probably within a year, following the cessation of impact.
Moderate adverse	Where the proposed development would cause a loss / change to the existing situation, such that once the proposed development is in place the situation will be partially changed. From an ecological perspective this is defined here as:

Magnitude of Impact	Description
	Land-take of a habitat or feature, if it occurs, affects 5-20% of the area. Where impacts are indirect, qualitative change occurs. The abundance of some of the more sensitive species may be reduced. Changes in habitat may be longer lasting. Impact is reversible, or nearly so, although recovery of impacts other than land-take may take up to three years following cessation of impact.
Major adverse	Where the proposed development would cause a total loss / substantial change to the existing situation, such that once the proposed development is in place the situation will be fundamentally changed. From an ecological perspective this is defined here as: Land-take of a habitat or feature, if it occurs, may be greater than 20%. Where impacts are indirect, disruption of ecosystem functioning occurs, with loss of species and loss of diversity. Changes may be long-lasting or permanent, particularly if loss or major alteration of wildlife habitat occurs. Recovery, if possible, is likely to take more than three years.

Significance of Effects

7.3.12 The value of the receptor or resource and the magnitude of the impact can be combined to produce an overall evaluation of whether an effect is significant. The matrix by which this is determined is shown in Table 7.3 below, where **H** = high effect, **M** = moderate effect, **L** = low effect and **Neutral** = neutral effect.

Table 7.3: Significance Evaluation Matrix

Magnitude of Impact[2]	Nature Conservation Value						
	Very High (International)	High (National)	Medium – High (Regional)	Medium (County/ Metropolitan)	Low – Medium (District/Borough)	Low (Parish/ Neighbourhood)	Negligible
Major	H	H	H/M	M	M	M/L	Neutral
Moderate	H	H/M	M	M	M	M/L	Neutral
Minor	H/M	M	M	L	Neutral	Neutral	Neutral
Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral

- **High** – an effect which in isolation could have a material influence on the decision making process – this would be considered significant;
- **Moderate** – an effect that on its own could have some influence on decision-making, particularly when combined with other similar effects – likely to be significant, a judgement needs to be applied;
- **Low** – an effect which on its own is likely to have a negligible influence on decision making but when combined with other effects could have a more material influence – less likely to be considered significant, a judgement needs to be applied;

[2] Could be beneficial or adverse

- **Neutral** – Very little or no effect, not significant.

7.3.13 An ecological effect results from an impact acting upon a resource. Direct effects on resources resulting from activities that are an integral part of the development will be considered in this ecological assessment. In addition, indirect, secondary and cumulative effects will be examined. The duration of the effect (*i.e.* permanent or temporary and short, medium or long-term) will also be taken into account.

Desk Study

7.3.14 A request was submitted to the Devon Biodiversity Records Centre (DBRC) for records of protected or notable species and habitats as well as statutory and non-statutory sites within 2km of the centre of the site. DBRC holds records from Devon Mammal Group, Devon Reptile and Amphibian Group and Butterfly Conservation amongst others.

7.3.15 In addition the following sources were interrogated for records of statutory and non-statutory sites, and relevant records of protected and/or notable habitat and species:

- Nature on the Map: www.natureonthemap.org.uk;
- Multi Agency Geographical Information for the Countryside: www.magic.gov.uk;
- National Biodiversity Network (NBN) Gateway: www.searchnbn.net;
- Natural England: consultation through meeting, telephone and email;
- Environment Agency: consultation through meeting, telephone and email.

Field Surveys

7.3.16 A number of field surveys have been undertaken, as detailed below.

7.3.17 It should be noted that some of the ecological reports appended to this assessment were prepared during the period in which MVV was bidding for the South West Devon Waste Partnership contract and its proposals for the site were evolving. Some details of the site boundary and of the proposed development may therefore differ slightly from the development for which planning permission is now being sought, although all of the survey work remains valid.

7.3.18 It should be noted that the extent of the new electricity cables and steam pipe work was not surveyed as part of the ecological surveys. However it is not considered that there would be any significant impacts on ecology since these pipe and cable routes are through urban areas of existing hard standing.

Extended Phase 1 Habitat Survey

7.3.19 The survey was undertaken in accordance with the standard Phase 1 Habitat Survey methodology (JNCC, 2007) in September 2009 and updated in June 2010. Both surveys were undertaken during the optimum season for vegetation surveys (optimum season between April – September). The scope of the survey was extended according to the methodology described by the Institute of Environmental Assessment (now the Institute of Environmental Management and Assessment) (1995) to include targeted searches for actual or potential presence of protected and/or notable species. This entailed mapping, describing and collating plant species lists for each of the main habitat types that were identified during the survey. Botanical taxonomic nomenclature followed that of Stace (2010). Target notes were used to highlight features of

particular ecological interest with the particular locations identified with the aid of a hand-held GPS. Photographic images were used to help provide a visual interpretation of the broad habitat types. The report can be found at Appendix 7.1.

Invasive Non-native Plant Species

7.3.20 During the Extended Phase 1 Habitat survey a search was also undertaken for non-native invasive plant species such as Japanese knotweed (*Fallopia japo*nica), giant hogweed (*Heracleum mantegazzianum*), Indian or Himalayan balsam (*Impatiens glandulifera*), rhododendron (*Rhododendron ponticum*) and Cotoneaster species.

Species

7.3.21 The potential for protected and/or notable species was assessed on the basis of the habitats present on the site and their suitability to support species of conservation concern. A summary of survey effort for the different species is indicated below.

Amphibians

7.3.22 During the Extended Phase 1 Habitat Survey a survey was undertaken to evaluate the site's potential to support amphibian species, including great crested newt. Amphibians require suitable aquatic and terrestrial habitat to support their life histories. They use ponds, lakes, canals and pools by rivers, but generally avoid running water. They also need terrestrial habitats close to breeding ponds. Suitable terrestrial habitats are those which provide humidity, shelter and food, *e.g.* open woodland, grassland and field edges, allotments and gardens.

7.3.23 Any water bodies and wetlands that supported aquatic, emergent and marginal vegetation were recorded as potential 'breeding pools'. Any suitable terrestrial habitat, particularly that lying within 500m of suitable breeding pools, was also identified.

Bats

7.3.24 Two mature trees on the site need to be felled as a result of the proposed development and so were surveyed in December 2010 for their potential to support roosting bats on the basis of the likely presence of suitable features (such as cracks, cavities, ivy, loose bark *etc*). The features were assessed from the ground with binoculars and the use of a 1,000,000 candlepower lamp for illumination of identifiable features. For further information, terminology and results see Appendix 7.2.

7.3.25 In addition to individual tree assessments, the potential value of linear features such as the woodland edges were assessed during the Extended Phase 1 Habitat Survey with regard to their potential use by commuting and/or foraging bats.

7.3.26 The Extended Phase 1 Habitat Survey did not identify the need for a bat activity survey neither was a requirement for such identified during the EIA Scoping exercise.

7.3.27 The need for a bat activity survey was discussed in a meeting with the Environment Agency and Natural England in November 2010. During this meeting it was agreed that the bare ground, hard standing and aggregate spoil which will be lost as a consequence of the development are unimportant as bat habitat, and since no linear features that bats might use are to be removed as part of the development, a bat activity survey to identify the presence/absence of foraging/feeding and/or commuting bats would not be required.

Dormouse

7.3.28 The site was assessed for the potential to support dormice (*Muscardinus avellanarius*) during the Extended Phase 1 Habitat Survey. The assessment was based on interconnectivity of arboreal and hedgerow habitats, along with the availability of seasonal food and of nesting material. Searches were also made for the remains of, or discarded, hazelnut shells where appropriate. Dormice feed in a definitive way on hazelnuts leaving distinctive marks and scrapes that are indicative of this species.

Otter

7.3.29 Evidence of otter activity was sought during one of the Breeding Bird Surveys along features such as watercourses, ponds, water bodies and drainage ditches located within the curtilage of the site. The methodology followed that of the full survey detailed in the *New Rivers and Wildlife Handbook* (RSPB, NRA & RSNC, 1994). The survey focused on the identification of field signs indicating the presence of otter, such as spraints, anal jelly, holts and runs.

Breeding and Wintering Birds

7.3.30 The site was surveyed for the potential to support breeding and wintering birds. Habitat such as scrub, woodland, standard trees and adjacent open fields/pasture were recorded as suitable habitat for breeding and wintering birds. An assessment was also made of any structure in relation to evidence of nesting birds, such as nesting debris, areas whitewashed with droppings, feeding remains, *etc.*

7.3.31 A detailed Breeding Bird Survey was undertaken (see Appendix 7.3) with five visits conducted during the period April to July 2010. The survey followed the standard Common Bird Census (CBC) methodology, as detailed by Marchant (1983) and Bibby *et al.* (1992). CBC involves production of maps showing the location of each territorial bird. Cold, windy or wet days were avoided since the activity, and thus detectability, of the birds is much reduced.

7.3.32 With the exception of those species for which the CBC is not suited (primarily colonial species such as rook, jackdaw, swallows and martins), the location, movements and activities of all birds present during the CBC survey were recorded on species maps using standard BTO species and activity codes (Marchant 1983; Bibby *et al.* 1992). These species maps were analysed to estimate the numbers of the various species within specific habitats of the study area and to compare how the birds are distributed in relation to different elements of the habitat. A route was mapped-out prior to the surveys being undertaken, paying particular attention to linear features, such as tree lines, and natural features such as waterbodies, areas of scrub and woodland. During each of the survey visits the site was walked in one-day periods between 08.00 and 13.00 hours.

7.3.33 A detailed Wintering Bird Survey was undertaken (see Appendix 7.4) with five survey visits conducted during the period November 2010 to March 2011. The route chosen followed that of the breeding bird survey. Standard BTO species codes and symbols for bird activities were used to identify birds and denote activity, sex and age where appropriate. Surveys were not undertaken in unfavourable conditions such as heavy rain or strong wind that may negatively affect the results.

Reptiles

7.3.34 Initially a survey was undertaken to evaluate the potential to support reptile species on the site. The assessment followed the methodology according to *Froglife* (1999) and involved identifying areas comprising dense vegetation (tussocky grassland or scrub edges) directly adjacent to open areas of rubble/rocks and/or short grassland. Such areas offer basking, feeding and hibernation opportunities for reptiles.

7.3.35 Subsequently a survey to confirm the presence/absence of reptiles on land within the site boundary was undertaken. Twenty one artificial refugia were placed in specific locations that are attractive to reptiles (*e.g.* sunny areas adjacent scrub, south facing, *etc.*) and left in-situ for 90 days' duration.

7.3.36 A total of eight survey visits were undertaken during May, June and September / early October 2010. During each visit all artificial refugia were checked during conditions suitable for use by reptiles (*i.e.* within a temperature range of between 10 - 20°C and avoiding rainy and windy conditions).

7.3.37 Each refuge was initially inspected from a suitable distance to identify any reptiles present, without causing disturbance. The refugia were then approached quietly and carefully, and lifted swiftly to examine the ground beneath. The number and sex (where possible) of any reptiles present was noted. Hand searches for reptiles were also undertaken during survey visits. This included searching beneath debris already occurring on site, including rubble piles, wooden planks and discarded roofing sheets.

7.3.38 Results from the reptile survey were utilised to provide a broad assessment of population size based on guidance set out by the Herpetofauna Groups of Britain and Ireland (HGBI, 1998). Under this methodology the size of the population is calculated by dividing the highest single count of each reptile species from one survey by the size of the site, to determine the number of reptiles per hectare for each species. On this basis a site is assessed against standard criteria for high, medium or low population assemblages. For further information, terminology and results see Appendix 7.5.

Water Vole

7.3.39 The site was assessed during the Extended Phase 1 Habitat Survey for the potential to support water voles. This involved identification of evidence of activity including: latrine sites, feeding stations and lawns, runways and prints. The survey methodology followed that of Strachan and Moorhouse (2006).

7.4 Baseline Conditions

7.4.1 This section provides a description of the nature conservation resources present in the study area and an appraisal of their value.

Designated Sites

7.4.2 Details of statutory and non-statutory designated sites are shown in Table 7.4.

7.4.3 There are three statutory sites of conservation importance located within 2 km of the site boundary. These are Plymouth Sound and Estuaries SAC, the Tamar Estuaries Complex (Tamar-Tavy Estuary) SPA; and the Tamar/Tavy Estuary SSSI.

- The SAC and SPA sites are considered to be of Very High (International) nature conservation value and the SSSI of High (National) value.

7.4.4 There are three further sites of international importance for nature conservation located within 15 km of the site boundary that are potentially sensitive to impacts from chimney emissions following standard Environment Agency guidance on screening point source emitters - South Dartmoor Woods SAC and Dartmoor SAC[3].

7.4.5 There are four non-statutory sites of conservation importance recorded within 2 km of the site. These are Kinterbury Creek CWS, Ernesettle Complex CWS, Ernesettle Battery Field Unconfirmed Wildlife Site (UWS) and Ernesettle Abandoned Playing Field UWS.

- The CWSs and UCWSs sites are considered to be of Medium (County) value.

7.4.6 Within 2 km of the site there is a mosaic of city-wide Biodiversity Network Features (BNF), which Plymouth City Council has identified in its Core Strategy to help ensure the protection and enhancement of natural features that function as important wildlife corridors. Blackies Wood, an area of semi-natural woodland within the northern area of the site boundary, is within a BNF.

- Blackies Wood BNF is considered to be of Low-Medium (District/Borough) value.

[3] Environment Agency (2010) Horizontal Guidance Note H1 – Annex (f), v2.2, August 2010. Although Blackstone Point SAC also lies within 15km of the proposed EfW site, it was scoped out of consideration following a meeting between Natural England and URS/Scott Wilson on 03/11/10

Table 7.4: Statutory and Non-statutory Designated Sites within 2 km

Site	Designation	Location	Approximate distance	Description
Plymouth Sound and Estuaries	SAC, part SSSI	SX465502	600 m west of the site boundary.	Estuaries, mudflats, sandbanks, large shallow inlets and bays.
Tamar Estuary (Tamar Tavy Estuary)	SAC and SPA	SX441620	1.9 km northwest of the site boundary.	Large shallow inlets and bays, estuaries, sandbanks, which are slightly covered by seawater all the time. Annex 1 of the Birds Directive include avocet and little egret.
Tamar-Tavy Estuary	SSSI	SX458629	1.9 km northwest of the site boundary.	Estuary and associated habitats.
Kinterbury Creek	CWS	SX436581	1 km northwest of the site boundary.	Mudflats, saltmarsh, reedbed and rocky foreshore with notable plant interest.
Ernesettle Complex	CWS	SX444595	1.5 km north of the site boundary.	Mosaic of unimproved neutral grassland, brackish ditches, scattered scrub and ancient semi-natural broadleaved woodland.
Ernesettle Battery Field	UWS	SX446593	1.5 km north of the site boundary.	Unimproved neutral grassland and scrub.
Ernesettle Abandoned Playing Field	UWS	SX448595	1.6 km north of the site boundary.	Semi-improved / unimproved grassland (some calcareous characteristics).
Blackies Wood	BNF	SX 44814 57632	Within the site boundary	Semi-natural broadleaved woodland.

Special Areas of Conservation (SAC): these are notified by Natural England because they contain species and/or habitats of European importance (listed in the Habitats Directive 1994), and are part of a network of conservation sites set up through Europe known as the Natura 2000 series. On land, almost all candidate SACs are, or will be notified as SSSIs. Natural England needs to be consulted before any operations likely to damage the special interest are undertaken. SAC is a statutory designation.

Special Protection Areas (SPA): these are classified under the Birds Directive to provide increased protection and management for areas which are important for breeding, feeding, wintering or migration of rare and vulnerable species of birds. They are notified by Natural England under the Habitats Directive (1992). All SPAs are notified as SSSIs, so Natural England needs to be consulted before any operations likely to damage the special interest are undertaken. SPA is a statutory designation with legal implications.

Sites of Special Scientific Interest (SSSI): these are notified by Natural England because of their plants, animals or geological features (the latter are geological SSSIs or gSSSI). Natural England needs to be consulted before any operations likely to damage the special interest are undertaken. SSSI is a statutory designation with legal implications.

County Wildlife Sites (CWS): these are sites of county importance for wildlife, designated on the basis of the habitat or the known presence of particular species. This is not a statutory designation like SSSIs, and does not have any legal status. County Wildlife Sites are usually included in Local Plans as sites of substantive nature conservation interest and are covered by Planning Policy Statement 9 (PPS9). CWS recognition does not demand any particular actions on the part of the Landowner and does not give the public rights of access. However, it may increase eligibility for land management grants.

Unconfirmed Wildlife Sites (UWS): these are sites identified as having possible interest but not fully surveyed. Some of these sites will be areas of significant wildlife interest.

Biodiversity Network Feature (BNF): Areas of semi-natural habitat likely to make a significant contribution to the overall movement/dispersal of species within the local landscape as wildlife 'stepping stones' or corridors. These include for example, areas of species-rich semi-improved grassland, double hedgerows/hedge banks, significant belts/areas of scrub, semi-natural or plantation broadleaved woodland and ponds. The best habitats are described a Key Network Features.

Habitats on and immediately adjacent to the site

7.4.7 The results of the 2009/10 Extended Phase 1 Habitat Survey are summarised in the habitat map in Appendix 7.1 and described below. Habitats on and immediately adjacent to the site comprise semi-natural broadleaved woodland, continuous scrub, rank semi-improved neutral grassland, running water and saltmarsh, ephemeral/short perennials, tall ruderals, amenity grassland, bare ground, hard standing and aggregate spoil. A small feeder stream, Barne Brake Creek, located adjacent to the east of the site boundary flows into Weston Mill Stream before joining Weston Mill Lake south of the site boundary.

Semi-natural broadleaved woodland

7.4.8 Blackies Wood, located within the site boundary, consists of semi-natural broadleaved woodland dominated by pedunculate oak/English oak (*Quercus robur*) and common ash (*Fraxinus excelsior*). Common hazel (*Corylus avellana*), common hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinosa*) are abundant in the understory with frequent wild cherry (*Prunus avium*) and English elm (*Ulmus procera*). Ground flora consist of wood avens (*Geum urbanum*), Spanish bluebell (*Hyacinthoides hispanica*), ramsons (*Allium ursinum*), scaly male fern (*Dryopteris affinis*), primrose (*Primula vulgaris*), lords-and-ladies (*Arum maculatum*) and bluebell (*Hyacinthoides non-scripta*).

- The Semi-natural broadleaved woodland is a National and Local BAP Priority Habitat (Lowland Mixed Deciduous Woodland). The woodland is also a BNF. It is therefore considered to be of Low-Medium (District/Borough) conservation value.

Continuous scrub

7.4.9 The continuous scrub is dominated by butterfly-bush (*Buddleja davidii*), blackthorn, sycamore (*Acer pseudoplatanus*), goat willow (*Salix caprea*), elder (*Sambucus nigra*), common hawthorn and pedunculate oak/English oak, with components of dog-rose (*Rosa canina*), bracken *(Pteridium aquilinum*), bramble (*Rubus fruticosus* agg.), European gorse (*Ulex europaeus*) and traveller's-joy (*Clematis vitalba*).

- Based on the species-poor nature of this habitat these areas are considered to be of Low (Parish/Neighbourhood) conservation value.

Rank semi-improved neutral grassland

7.4.10 Rank semi-improved neutral grassland within the site is dominated by perennial rye-grass (*Lolium perenne*), false oat-grass (*Arrhenatherum elatius*), Yorkshire fog (*Holcus lanatus*), cock's-foot (*Dactylis glomerata*), red fescue (*Festuca rubra*), common daisy (*Bellis perennis*) and white clover (*Trifolium repens*), with occasional bird's-foot-trefoil (*Lotus corniculatus*), black medick (*Medicago lupulina*) and creeping buttercup (*Ranunculus repens*).

- Based on the species-poor nature of this habitat these areas are considered to be of Low (Parish/Neighbourhood) conservation value.

Running water and saltmarsh

7.4.11 There is a small feeder stream, Barne Brake Creek, located adjacent to the east of the site boundary which flows into Weston Mill Stream before joining Weston Mill Lake south of the site boundary. Brane Brake Creek and Weston Mill Stream experience tidal flows extending towards their upper limits with saltmarsh habitats (approximately 0.44 ha) towards the lower reaches. Vegetation associated with saltmarsh habitats includes common glasswort (*Salicornia europaea*), sea aster (*Aster tripolium*) and sea purslane (*Halimione portulacoides*).

- Barne Brake Creek and Weston Mill Stream are considered to be of Low (Parish/Neighbourhood) ecological value. Whilst the associated saltmarsh habitat is a National and Local BAP Priority Habitat (Coastal saltmarsh), due to its relatively small size and extent it is considered to be of Low - Medium (District/Borough) conservation value.

Ephemeral/short perennial habitat

7.4.12 Areas of ephemeral/short perennial vegetation at the site include species such as common ragwort (*Senecio jacobaea*), greater plantain (*Plantago major*), oxeye daisy (*Leucanthemum vulgare*), ribwort plantain (*Plantago lanceolata*), selfheal (*Prunella vulgaris*), wild carrot (*Daucus carota*) and winter heliotrope (*Petasites fragrans*).

- These areas of habitat are considered to be of Negligible conservation value and as such they are not considered further in this assessment.

Tall ruderals

7.4.13 Areas of tall ruderal habitat at the site consist of teasel (*Dipsacus fullonum*), hogweed (*Heracleum sphondylium*), creeping thistle (*Cirsium arvense*), spear thistle (*Cirsium vulgare*), foxglove (*Digitalis purpurea*), common nettle (*Urtica dioica*), broad-leaved dock (*Rumex obtusifolius*), white melilot (*Melilotus albus*), and rosebay willowherb (*Chamerion angustifolium*).

- These areas of habitat are considered to be of Negligible conservation value and as such they are not considered further in this assessment.

Amenity grassland

7.4.14 Amenity grassland occurs to the north of the main development area, outside of the perimeter fence of the dockyard but within the proposed red line boundary, and is dominated by perennial rye-grass.

- This habitat was considered to be of Negligible nature conservation value and as such it is not considered further in this assessment.

Bare ground, hard standing and aggregate spoil

7.4.15 Bare ground within the site boundary was mainly composed of crushed aggregates with spoil heaps. Hard standing on the site consists of an access road that traverses the site.

- This habitat was considered to be of Negligible conservation value and as such it is not considered further in this assessment.

Species

Legally Protected or Notable Species

7.4.16 Details of legally protected and/or notable species recorded within 2 km (4km for bats) of the site from the desk study are shown in Table 7.5.

Table 7.5: Summary of Data Received from Organisations Consulted During the Desk Study

Organisations	Records
Environmental Records from Devon Biodiversity Records Centre (DBRC). Holds records for the Devon Wildlife Trust, Devon Reptile and Amphibian Group, Devon Invertebrate Group and Devon Local Bat Group. Dated October 2010.	**Birds** Records exist for barn swallow *(Hirundo rustica)*, black-headed gull (*Larus ridibundus)*, black-legged kittiwake (*Rissa tridactyla)*, black redstart *(Phoenicurus ochruros),* bullfinch *(Pyrrhula pyrrhula)*, dunnock *(Prunella modularis)*, green woodpecker *(Picus viridis)*, grey wagtail *(Motacilla cinerea)*, herring gull *(Larus argentatus)*, house martin *(Delichon urbica)*, house sparrow *(Passer domesticus)*, kestrel *(Falco tinnunculus)*, kingfisher *(Alcedo atthis)*, linnet *(Carduelis cannabina)*, little egret *(Egretta garzetta)*, mallard *(Anas platyrhynchos)*, mistle thrush *(Turdus viscivorus)*, mute swan *(Cygnus olor)*, oystercatcher (*Haematopus ostralegus)*, redwing *(Turdus iliacus)*, skylark (*Alauda arvensis)*, starling (*Sturnus vulgaris*), song thrush *(Turdus philomelos)* and willow warbler *(Phylloscopus trochilis)*. All recorded within 2 km of the site. **Mammals (not including bats)** Records for common shrew (*Sorex araneus*) and hedgehog (*Erinaceus europaeus*) within 2km of the site. **Bats** Records for a long-eared bat (*Plecotus spp.)*, common pipistrelle (*Pipistrellus pipistrellus*), lesser horseshoe bat (*Rhinolophus hipposideros*), noctule (*Nyctalus noctula*), serotine (*Eptesicus serotinus*) and soprano pipistrelle (*Pipistrellus pygmaeus*) within 2 – 4 km of the site. **Reptiles and amphibians** Records exist for common lizard (*Zootoca vivipara)*, slow worm (*Anguis fragilis*)**,** common toad *(Bufo bufo)*, common frog (*Rana temporaria*) and palmate newt (*Lissotriton helveticus)* within 2km of the site. **Invertebrates** Records exist for a robber fly (*Asilus crabroniformis*)**,** cinnabar (*Tyria jacobaeae*), great green bush cricket (*Tettigonia viridissima*), Jersey tiger (*Euplagia quadripunctaria*), long-winged conehead (*Conocephalus discolor*), purple hairstreak (*Quercusia quercus)*, small heath (*Coenonympha pamphilus*) and wasp spider (*Argiope bruennichi*) within 2km of the site. **Plants** Records exist for annual sea-blite (*Suaeda maritima*), box (*Buxus*

Organisations	Records
	sempervirens), broad-leaved everlasting-pea (*Lathyrus latifolius*), cabbage *(Brassica oleracea*), chives (*Allium schoenoprasum*), common broomrape (*Orobanche minor*), common saltmarsh-grass (*Puccinellia maritima*), dwarf mouse-ear (*Cerastium pumilum*), English scurvygrass (*Cochlearia anglica*), garden parsley (*Petroselinum crispum*), hard grass (*Parapholis strigosa*), ivy broomrape (*Orobanche hederae*), knotted clover (*Trifolium striatum*), lesser meadow-rue (*Thalictrum minus*), lesser sea-spurrey (*Spergularia marina*), orpine (*Sedum telephium*), prickly lettuce (*Lactuca serriola*) prostrate toadflax (*Linaria supina*), rat's-tail fescue (*Vulpia myuros*), red goosefoot (*Chenopodium rubrum*), round-leaved crane's-bill (*Geranium rotundifolium)*, sea-buckthorn (*Hippophae rhamnoides*), sea couch (*Elytrigia atherica*), sea fern-grass (*Catapodium marinum*), sea aster (*Aster tripolium*), sea purslane (*Halimione portulacoides*), small-flowered buttercup (*Ranunculus parviflorus*), stinking hellebore (*Helleborus foetidus*), tree lupin (*Lupinus arboreus)* and twiggy mullein (*Verbascum virgatum*) within 2 km of the site. **Invasive plant species** Records of Japanese knotweed (*Fallopia japonica*) within 2 km of the site.
NBN Gateway: Accessed on 8 November 2010. http://www.searchnbn.net/	**Birds** Records exist for cirl bunting (*Emberiza cirlus)* within 2 km of the site. **Invertebrates** Records exist for August thorn (*Ennomos quercinaria*), beaded chestnut (*Agrochola lychnidis*), blood-vein (*Timandra comae*), buff ermine (*Spilosoma luteum*), dot moth (*Melanchra persicariae*), dusky thorn (*Ennomos fuscantaria*), flounced chestnut (*Agrochola helvola*), galium carpet (*Epirrhoe galiata*), knot grass (*Acronicta rumicis*), marsh fritillary (*Euphydryas aurinia*), mullein wave (*Scopula marginepunctata*), large wainscot (*Rhizedra lutosa*) and wall (*Lasiommata megera*) within 2 km of the site.

Amphibians

7.4.17 Under the Wildlife and Countryside Act, 1981 (as amended) the more common amphibian species, such as palmate newt (*Triturus helveticus*), common toad (*Bufo bufo*) and common frog (*Rana temporaria*) receive limited protection under Sections 9 (1) and 9 (5), which make it an offence to intentionally and recklessly kill, injure or take any species of amphibian.

7.4.18 Although the desk study revealed records of common toad *(Bufo bufo)*, common frog (*Rana temporaria*) and palmate newt (*Lissotriton helveticus)* within 2 km of the site boundary, the site itself is considered to have negligible potential to support amphibians with no freshwater bodies located on site. All water bodies on and adjacent to the site are tributaries and creeks associated with the Tamar Estuary and the salinity of the water bodies makes them unsuitable for amphibians.

7.4.19 During the Extended Phase 1 Habitat Survey, newt species were recorded breeding in a settling pool at Bull Point northwest of the site. However, the settling pool is over 500m away from the site and is separated by roads, hardstanding and well-maintained amenity grassland. It is therefore considered that the site of the proposed EfW CHP facility will not be used as terrestrial habitat by newts breeding in the pond at Bull Point.

- The site is considered to be of Negligible value for amphibians, and as such they are not considered further in this assessment.

Bats

7.4.20 All bat species are afforded protection under the Wildlife and Countryside Act, 1981 (as amended) and the Conservation of Habitat and Species Regulations 2010. Under this legislation it is an offence to intentionally kill, injure or take a bat. It is also an offence to intentionally or recklessly damage, destroy or obstruct access to any place that a bat uses for shelter or protection.

7.4.21 The linear features of the continuous scrub within Blackies Wood may provide foraging/feeding and/or commuting habitat for bats roosting off the site, since they are well structured and provide potential flight paths or corridors. The mature trees may provide suitable roosting habitat for bats, particularly since some of these trees provide suitable features, such as cracks, crevices, flaking bark and rot-holes.

7.4.22 A tree survey for the potential to support roosting bats was undertaken on two semi-mature oak trees in the southwest of the site that are to be felled as a result of the development. Both trees have negligible potential to support roosting bats.

7.4.23 The need for a bat activity survey was discussed in a meeting with the Environment Agency and Natural England in November 2010. During this meeting it was agreed that the bare ground, hard standing and aggregate spoil which will be lost as a consequence of the development are unimportant as bat habitat, and since no linear features that bats might use are to be removed as part of the development, a bat activity survey to identify the presence/absence of foraging/feeding and/or commuting bats would not be required.

- The site is considered to be of Negligible conservation value for roosting bats and Low (Parish/Neighbourhood) value for foraging/feeding and/or commuting habitat for bats.

Dormouse

7.4.24 The common or hazel dormouse is fully protected under the Wildlife and Countryside Act, 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010. It is a Species of Principal Importance under Section 74 of Countryside and Rights of Way Act, 2000 and is a UK BAP Priority Species. It is in long-term decline due to habitat loss and fragmentation throughout the UK and internationally.

7.4.25 No evidence of hazel dormice was recorded during the desk study or field survey. The scrub and woodland areas within the site are unsuitable for dormice, with limited food and nesting material available. The woodland also experiences considerable disturbance from general public accessing the woodland. The surrounding habitats were also recorded as low value for this species. The fragmented arboreal habitats had poor connectivity within the local landscape. The urban and industrial environment of the surrounding landscape renders the area unsuitable for dormice.

- The site is considered to be of Negligible value for dormouse, and as a consequence they are not considered further in this assessment.

Otter

7.4.26 Otters are afforded full protection under the Wildlife & Countryside Act, 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010. Under this legislation, offences include intentional capture, handling and disturbance or destruction of their habitat. Otter is a Species of Principal Importance under Section 74 of Countryside and Rights of Way Act (2000) and is also a UK BAP Priority Species.

7.4.27 No evidence of common otter activity was recorded during the desk study or field survey, although it is known that common otter use the Tamar Estuary. On the 15 November 2010, during one of the Wintering Bird Survey visits, a dead mature dog otter was recorded adjacent to the railway bridge by Weston Mill Stream, outside of the site boundary. This suggests that otters use this watercourse on occasion.

7.4.28 The habitats on the site are considered to be of low value for this species due to the enclosed nature of the site, *i.e.* security and perimeter fencing and grilled culverts, which would deny access to and from the Tamar estuary, restricting otter movements.

- The site is considered to be of Negligible conservation value for common otter. However, the adjacent Weston Mill Stream is considered to be of Low to Medium (District/Borough) conservation value for common otter.

Breeding and Wintering Birds

7.4.29 All species of wild bird in the UK (apart from certain pest species) are protected under Part 1 Section 1(1) of the Wildlife and Countryside Act, 1981 (as amended). Wild birds are protected against intentional killing, injuring or taking as well as taking, damaging or destroying nests in use or being built, and taking or destroying eggs. In addition to general protection for birds, certain species listed in Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended) are afforded additional protection in relation to disturbance whilst nesting.

7.4.30 The habitats found on site are likely to provide suitable nesting, roosting and foraging habitats for a variety of bird species. Schedule 1 bird species and Red List Species of Conservation Concern (SoCC) such as kestrel, black redstart and redwing, have been recorded on or near the site. The tributaries and creeks associated with Weston Mill Lake and the Tamar Estuary provide suitable habitat for kingfisher and are used for feeding and foraging during the winter.

7.4.31 The Breeding Bird Survey revealed territories for house sparrow (*Passer domesticus*), which are a Red List SoCC, breeding in buildings adjacent to the development site, and whitethroat (*Sylvia communis*) and dunnock (*Prunella modularis*), which are Amber List species, breeding within Blackies Wood. Green List species recorded breeding on the site were black bird (*Turdus merula*), robin (*Erithacus rubecula*), wren (*Troglodytes troglodytes*), greenfinch (*Carduelis chloris*), goldfinch (*Carduelis carduelis*), great tit (*Parus major*), blackcap (*Sylvia atricapilla*), chiffchaff (*Phylloscopus collybita*), chaffinch (*Fringilla coelebs*) and long-tailed tit (*Aegithalos caudatus*) - see Appendix 7.3 for full details.

7.4.32 The Wintering Bird Survey revealed herring gull (*Larus argentatus*) and dunlin (*Calidris alpina*) (Red List SoCC) over-wintering on the site. The herring gull is also a UK BAP priority species. Amber List species recorded overwintering on the site included black-headed gull (*Larus*

ridibundus), grey wagtail *(Motacilla cinerea*), little egret (*Egretta garzetta*), mallard (*Anas platyrhynchos*), turnstone (*Arenaria interpres*) redshank (*Tringa totanus*) and dunnock (*Prunella modularis*), which is also a UK BAP Priority Species (see Appendix 7.4 for full details).

7.4.33 During the Wintering Bird Survey, species recorded outside the site boundary but which will most probably be using the site were starling (*Sturnus vulgaris*) and skylark (*Alauda arvensis*), Red List and UK BAP priority species, and kingfisher (*Alcedo atthis*) and black redstart (*Phoenicurus ochruros*) Schedule 1 Part 1, Amber List species.

7.4.34 Black redstarts were specifically targeted for survey as these had been recorded on the site by Ministry of Defence employees in the past. Three black redstarts were recorded foraging during the Wintering Bird Survey just outside the site boundary. Several records exist for black redstart over-wintering on the site; they have also been recorded foraging on the aggregate spoil heaps on the site. There are no records of black redstart breeding on the site. However, suitable buildings for nesting do occur within the wider dockyard.

7.4.35 Most species recorded were widespread and common across the site. General species such as blackbird, chiffchaff, great tit and chaffinch were concentrated amongst the scrub and trees within Blackies Wood.

7.4.36 The value of the site to birds was highly variable. Typically, the more valuable habitats in terms of species diversity and presence of the more local species included the scrub, woodland and waterside habitats (Appendix 7.4). The crushed aggregate and bare ground makes up suitable foraging and feeding habitat for overwintering black redstart.

- Overall the site is considered to be of Low-Medium (District/Borough) conservation value for breeding and wintering birds. However, the crushed aggregate and bare ground habitats were considered to be of Medium (County / Metropolitan) conservation value with respect to over-wintering black redstart.

Reptiles

7.4.37 The more common reptile species, such as grass snake (*Natrix natrix*), adder (*Viper berus*), slow worm (*Anguis fragilis*) and common lizard (*Zootoca vivipara*) receive limited protection under Section 9 (1) and (5) of the Wildlife and Countryside Act, 1981 (as amended), which makes it an offence to intentionally and recklessly kill, injure or take any species of reptile.

7.4.38 Areas around the large aggregate spoil and bare ground were classed as suitable reptile habitat. The open, undisturbed, well-drained nature of the site, presence of natural and artificial refugia, dense vegetation (tussocky grassland or scrub edges) and suitable south facing features make the habitats particularly suitable for slow-worm or common lizard. The mosaic of habitats present provides both cover and basking habitats for reptiles. The desk study revealed records of slow-worm and common lizard within 2 km of the site boundary, the closest records being 300m east of the site.

7.4.39 The detailed Reptile Survey identified a minimum of seven adult slow-worms on the site. The slow-worms were all recorded around the large aggregate spoil and bare ground areas within the site. Evidence of breeding was also recorded with a minimum of three juveniles noted on the site during the survey visits.

7.4.40 One common lizard was also recorded on the site.

7.4.41 Based on peak adult counts the survey results equate to approximately ten slow-worms per hectare and one common lizard per hectare. On this basis both the slow-worm and common lizard populations on the site has been estimated as 'low' (HGBI, 1998).

- The site is considered to be of Low-Medium (District/Borough) conservation value for reptiles.

Water Vole

7.4.42 The water vole is afforded full protection under Section 9 of the Wildlife and Countryside Act, 1981 (as amended). Under this legislation, offences include to intentionally kill, injure or take water voles; possess or control live or dead water voles; intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection; and/or intentionally or recklessly disturb water voles whilst occupying a structure or place used for that purpose.

7.4.43 During the Extended Phase 1 Habitat Survey, habitats on the site were assessed for potential to support water vole. There were no signs of water vole activity and the majority of habitats on the site were of limited potential to support this species. No records of water vole were found in the desk study.

- This site is considered to be of Negligible conservation value for water vole and as such this species is not considered further in this assessment.

Protected and/or Notable Plants

7.4.44 Certain plant species are protected under Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 5 of The Conservation of Habitats and Species Regulations 2010. It is an offence to deliberately pick, collect, cut, uproot or destroy these wild plants. It is also an offence for any purpose to possess, sell or exchange such a plant.

7.4.45 No protected or nationally rare plant species were recorded from the site.

7.4.46 Sea couch, sea aster, common saltmarsh-grass and sea purslane were recorded within the saltmarsh habitats outside the site boundary. Primrose, a Devon BAP Priority Species, was recorded on the site, in and around Blackies Wood.

7.4.47 Invasive alien species are listed under Schedule 9 of the Wildlife and Countryside Act, 1981, namely Japanese knotweed and giant hogweed. It is an offence to plant or cause the spread of these species.

7.4.48 A stand of Japanese knotweed was recorded south west of the site, adjacent to Weston Mill Lake. This stand is approximately 2m x 2m and had been previously treated with herbicide. A further stand of Japanese knotweed was also recorded to the north of the site in Blackies Wood. This stand consists of a few immature stems at present.

7.4.49 *Cotoneaster sp.* is also present in Blackies Wood.

7.4.50 Other non-native invasive plants recorded in Blackies Wood, which are not listed under the Wildlife and Countryside Act, 1981 include Himalayan honeysuckle (*Leycesteria formosa*), and snowberry (*Symphoricarpos albus*). Large amounts of butterfly bush (*Buddleja davidii*) were also recorded on the site growing on the bare rock and rubble.

- This site is considered to be of Negative conservation value due to the presence of invasive alien species listed under Schedule 9 of the Wildlife and Countryside Act, 1981.
- The site is considered to be of Low (Parish/Neighbourhood) conservation value for plants, due to the presence of Devon notable plant species.

Terrestrial Invertebrates

7.4.51 The NBN Gateway desk study revealed records for August thorn, beaded chestnut, buff ermine and knot grass moths, and marsh fritillary butterfly within 2 km of the site. There are no records of terrestrial invertebrates from the site itself.

7.4.52 It was not considered necessary to undertake a specialist invertebrate survey and this was agreed through the EIA Scoping exercise.

- The site is considered to be of Low - Medium (District/Borough) conservation value for terrestrial invertebrates.

Future Ecological Baseline Conditions

7.4.53 Future ecological baseline conditions are presumed to remain broadly the same as the conditions that exist on the site at present. This would not change during the expected time period prior to construction of the development, which is scheduled to commence in early 2012 and be completed by late 2014.

7.4.54 The current usage of the site is derelict land which comprises bare ground, hard standing and aggregate spoil, with continuous scrub, rank semi-improved neutral grassland, ephemeral/short perennials, tall ruderals and semi-natural broadleaved woodland. If the development did not go ahead then successional changes would occur over time. This would eventually lead to pioneer scrub species colonising the site and the site would turn into secondary woodland within around fifty years.

Summary of Evaluation

7.4.55 Table 7.6 provides a summary of the value of ecological receptors identified, or for which the presence on site was investigated.

Table 7.6: Value of Ecological Receptors

Receptor	Value	Distance from receptor to the site
Statutory and non-statutory designated sites of nature conservation importance		
Plymouth Sound and Estuaries SAC (part SSSI)	Very High (International) importance and high (National) importance	600 m
Tamar Estuary (Tamar Tavy Estuary) SAC and SPA	Very High (International) importance	1.9 km
Tamar-Tavy Estuary SSSI	High (National) importance	1.9 km
Kinterbury Creek CWS	Medium (County) importance	1 km
Ernesettle Complex CWS	Medium (County) importance	1.5 km
Ernesettle Battery Field UWS	Medium (County) importance	1.5 km

Ernesettle Abandoned Playing Field UWS	Medium (County) importance	1.6 km
Blackies Wood BNF	Low-Medium (District/Borough) importance	On site
Habitats (botanical and intrinsic value)		
Semi-natural broadleaved woodland	Low-Medium (District/Borough) conservation value.	
Continuous scrub	Low (Parish/Neighbourhood) conservation value	
Rank semi-improved neutral grassland	Low (Parish/Neighbourhood) conservation value	
Running water and saltmarsh	Low (Parish/Neighbourhood) conservation value and Low - Medium (District/Borough)	
Ephemeral/short perennial habitat	Negligible conservation value	
Tall ruderals	Negligible conservation value	
Amenity grassland	Negligible conservation value	
Bare ground, hard standing and aggregate spoil	Negligible conservation value	
Species		
Amphibians	Negligible conservation value	
Bats (roosting, and foraging/feeding and/or commuting habitat).	Negligible conservation value and Low (Parish/Neighbourhood) conservation value respectively	
Dormouse	Negligible conservation value	
Otter (site and the adjacent watercourses)	Negligible conservation value and Low to Medium (District/Borough) conservation value respectively	
Breeding and wintering birds	Low-Medium (District/Borough) conservation value	
Black Redstart	Medium (County / Metropolitan) conservation value	
Reptiles	Low-Medium (District/Borough)	
Water vole	Negligible conservation value	
Protected and notable plants (non-native invasive)	Negative conservation value	
Protected and notable plants	Low (Parish/Neighbourhood) conservation value	
Terrestrial invertebrates	Low - Medium (District/Borough) conservation value	

7.5 Incorporated Mitigation / Avoidance

7.5.1 The following measures to avoid or limit the scale of adverse effects on ecological receptors are considered intrinsic to the scheme.

Air Pollution Control

7.5.2 The plant design includes an extensive Air Pollution Control (APC) system, full details of which can be found in Section 6.3 of ES Chapter 6. Acid pollutants hydrochloric acid, sulphur dioxide and hydrogen fluoride will be removed by a dry scrubbing and filtration system, using sodium bicarbonate as the reagent. A controlled amount of powdered activated lignite carbon will also be injected into the flue gas. Emissions will be continuously monitored to ensure compliance with the Waste Incineration Directive requirements.

7.6 Impact Assessment

Impacts During Construction Phase

Designated Sites

7.6.1 There will be no land take (permanent or temporary) from the designated sites, namely SAC, SPA, SSSIs, CWS, UWS or BNF described in the baseline environmental conditions, with the exception of the felling of two trees within Blackies Wood which are of low value (see Appendix 8.1). However, woodland management at Blackies Wood BNF will be undertaken for the benefit of biodiversity.

- Land take would have a Neutral impact on designated sites of varying values meaning the resulting effects are therefore considered to be **Neutral, and not significant**.

7.6.2 Temporary noise disturbance from the construction activities has the potential to impact upon breeding and wintering birds of the Tamar Estuaries Complex SPA and Tamar Estuary (Tamar Tavy Estuary) SSSI, although these designated sites are approximately 600m distant at their closest. Furthermore, at present HMNB Devonport and the wider dockyard already generate noise from their facilities, and these activities are closer to these designated sites.

- Temporary noise disturbance would have a Neutral impact on resources of Very High (International) importance and the effects are therefore considered to be **Neutral and not significant**.

7.6.3 Dust is considered to have the potential to coat vegetation on the edges of Blackies Wood BNF, although this would only be likely to occur over short periods, during dry weather, and when works are undertaken adjacent to the boundary with the woodland.

- Dust would have a Minor adverse impact on a resource of Low-Medium (District/Borough) importance and the effects are considered to be **Neutral and not significant**.

7.6.4 A number of construction activities have the potential to impact on water quality including the removal of two culverts and replacement with a new clear-span bridge; the construction of the air cooled condensers; and the storage of fuels on site. These activities have the potential to impact upon the water environment, through for example pollution and or sedimentation. The assessments of contamination and hydrological impacts (ES Chapters 10 and 11 respectively) of these activities have not identified significant effects on designated marine sites, the closest of which is approximately 600m to the west.

7.6.5 A detailed Construction Environmental Management Plan (CEMP) will be produced prior to construction and an outline CEMP is provided in ES Appendix 6.3. In addition the civil engineering contractor, Kier, has produced Method Statements for the construction of the clear span bridge (Appendix 6.5), installation of the foundations for the Air Cooled Condensers (Appendix 6.4) and construction of the Bull Point Access Road (Appendix 6.6) which contain information regarding the techniques and methods that will be used to limit the impact of the construction phase on the water environment.

- Pollution and /or sedimentation would have a Neutral adverse impact on a resource of Very High (International) importance and High (National) importance and the effects are considered to be **Neutral and not significant**.

Habitats

7.6.6 The habitats on and adjacent to the site include semi-natural broadleaved woodland, continuous scrub, rank semi-improved neutral grassland, running water and saltmarsh, ephemeral/short perennial vegetation, tall ruderal habitat, amenity grassland, bare ground, hard standing and aggregate spoil. Each of these habitats is assessed below in relation to temporary and permanent landtake, dust deposition and sedimentation where applicable.

7.6.7 A biodiversity budget has been prepared to assess the loss/gain of biodiversity on site and can found in Appendix 7.6.

Semi-natural broadleaved woodland

7.6.8 With the exception of two oak trees which are of local landscape value and have negligible potential to support roosting bats (see Appendix 7.2) there will be no (permanent or temporary) land take from the semi-natural broadleaved woodland of Blackies Wood BNF, which covers approximately 3.70 ha of the site.

- Therefore land take associated with the development would have a Minor adverse impact on a resource of Low-Medium (District/Borough) importance and the effects are considered to be **Neutral and not significant**.

7.6.9 Fugitive dust emissions have been dealt with in paragraph 7.6.3 above for the semi-improved broadleaved woodland of Blackies Wood BNF.

- Dust would have a Minor adverse impact on a resource of Low-Medium (District/Borough) importance and the effects are considered to be **Neutral and not significant**.

Continuous scrub

7.6.10 The continuous scrub to the west of the site is to be removed to enable construction of the workshop and car park. The area of continuous scrub to be removed measures approximately 0.3 ha (the total area of scrub on site is approximately 1 ha).

- This area will need to be permanently removed. Therefore the development would have a Minor adverse impact on a resource of Low (Parish/Neighbourhood) importance and the effects are considered to be **Neutral and not significant**.

Rank semi-improved neutral grassland

7.6.11 The areas of rank semi-improved neutral grassland in the vicinity of the two culverts and to the east of these along the access road will be lost to the development in order to demolish the culverts and construct the new bridge, weighbridge and parts of the access road. This area measures approximately 0.4 ha. There are two other areas of rank semi-improved neutral grassland that would not be affected, namely the strip alongside the feeder stream (Barne Brake Creek) to the east of the site, and the areas on the steep slopes around Table Top Mountain, which together measure approximately 0.4 ha in area.

- The development would have a Minor adverse impact on a resource of Low (Parish/Neighbourhood) importance and the effects are considered to be **Neutral and not significant**.

Running water and saltmarsh

7.6.12 There is a small feeder stream (Brane Brake Creek) located to the east of the site boundary which flows into Weston Mill Stream before joining Weston Mill Lake south of the site boundary. Barne Brake Creek and Weston Mill Stream experience tidal flows extending towards their upper limits with saltmarsh habitats (approximately 0.44 ha) towards the lower reaches. The development will require demolition of the two culverts which currently cross Weston Mill Stream and the construction of a new clear span bridge. These works would mobilise sediments and there is potential for these sediments to enter the watercourse. A Method Statement for the demolition of the two culverts and construction of the new clear span bridge can be found in Appendix 6.5. At the request of the Environment Agency, a marine intertidal baseline survey will be undertaken in May – September 2011 and the area subsequently monitored for five years. This survey will provide a baseline against which any possible unpredicted impacts during the demolition of the culverts and construction of the bridge can be monitored. Further details of the survey method are given in Section 7.7.

7.6.13 Overall, replacement of the two culverts with a single clear span bridge is considered to be an improvement as is will naturalise the river channel.

- Culvert demolition and bridge construction would have a Minor adverse impact on a resource of Low (Parish/Neighbourhood) importance and the effects are considered to be **Neutral and not significant**.
- The fact that two culverts are to be replaced with one clear-span bridge means that there would be Moderate beneficial impacts on a resource of Low (Parish / Neighbourhood) importance. In this very localised area, these **beneficial** effects are considered to be of **moderate significance**.

7.6.14 Fugitive dust emissions from construction activities may temporarily coat vegetation and wetland habitats immediately adjoining the site.

- Dust would have a Minor adverse impact on resources of Low (Parish/Neighbourhood) to Low-Medium (District/Borough) importance and the effects are considered to be **Neutral and not significant**.

Species

Bats

7.6.15 There are no buildings or trees recorded on the site that have the potential to support roosting bats.

- The development would have a Neutral impact on a resource of Negligible importance and the effects are considered to be **Neutral and not significant.**

7.6.16 The continuous scrub to the west of the site is to be removed. This habitat is located adjacent to Blackies Wood BNF. The woodland edges and scrub may provide foraging/feeding and/or commuting habitat for any bats which may be roosting off the site. Removal of the scrub has the

theoretical potential to affect bat behaviour *i.e.* change in foraging areas or commuting routes, although this is not expected to be significant.

- Land take will have a Neutral impact on a resource of Low (Parish/Neighbourhood) importance and the effects are considered to be **Neutral and not significant.**

7.6.17 Any limited lighting used during construction has the potential to result in disturbance of any foraging/commuting bats that may be present. However, there are already lights fitted to the security fence separating Blackies Wood from the main part of the site where the EfW CHP facility main building will be constructed. Furthermore the construction compound will be located on Table Top Mountain, away from woodland edges and scrub that may provide foraging/feeding and/or commuting habitat for bats. It is anticipated that any disturbance of foraging/commuting bats would be both temporary and confined to those areas of retained habitat immediately adjoining the site.

- Therefore lighting during construction is considered likely to only result in a Minor adverse impact on a resource of Low (Parish/Neighbourhood) importance and the effects are considered to be **Neutral and not significant**.

Otter

7.6.18 The site is entirely enclosed by security fencing and all culverts allowing water through the site are grilled, which would deny access and restrict otter movements. The presence of otters occasionally migrating through the site would seem highly unlikely due to the restricted access to and from the Tamar estuary. The site is considered to be of negligible conservation value for common otter and the adjacent watercourse is considered to be of Low to Medium (District/Borough) conservation value.

- Land take would have a Neutral impact on a resource of Negligible importance and the effects are considered to be **Neutral and not significant**.

7.6.19 Demolition of the two culverts over the watercourse to the east of the site is required as part of the development. The culverts are grilled, considerably restricting access for otters. The demolition of the culverts and the construction of the new clear span bridge will cause some temporary disturbance. Potential disturbance to otters during construction would not be increased from that of baseline levels.

- Therefore the development would have a Neutral impact on a resource of Low to Medium (District/Borough) importance and the effects are considered to be **Neutral and not significant**.

Breeding and wintering birds

7.6.20 The value of the site to breeding birds is variable. Typically, the more valuable habitats in terms of species diversity and presence of the more local species included the scrub, woodland and waterside habitats. Some of the continuous scrub on the site is to be lost as a result of the development and this habitat will be used by birds during the breeding season.

- Therefore land take would have a Minor adverse impact on a resource of Low to Medium (District/Borough) importance and the effects are considered to be **Neutral and not significant**.

7.6.21 Wintering birds recorded on the site were similar to those of the breeding bird surveys. However, herring gull, black-headed gull, grey wagtail, little egret and mallard were recorded adjacent to the site.

- Therefore land take would have a Minor adverse impact on a resource of Low to Medium (District/Borough) importance and the effects are considered to be **Neutral and not significant**.

7.6.22 Temporary noise disturbance from the construction is likely to have an impact upon breeding and wintering birds within Blackies Wood BNF. In addition, temporary lighting may cause an alteration or disruption to birds' diurnal activity patterns. However, there are already lights fitted to the security fence separating Blackies Wood from the main part of the site where the EfW CHP facility main building will be constructed. Furthermore the construction compound will be located on Table Top Mountain, away from the woodland edges and scrub that may provide habitat for breeding or wintering birds.

- The development would have a Minor adverse impact on a resource of Low to Medium (District/Borough) importance and the effects are considered to be **Neutral and not significant**.

Black redstart

7.6.23 Three black redstarts were recorded foraging during the winter bird survey just outside of the development footprint. Several records exist for black redstart overwintering on the site and have been recorded foraging on the aggregate spoil heaps on the site. There are no records of black redstart breeding on the site. However, suitable buildings for nesting do occur within the wider dockyard. The crushed aggregate and bare ground consists of approximately 3.6 ha of the site, which makes up 100% of suitable foraging and feeding habitat for overwintering black redstart on the site.

- Therefore landtake would have a Major adverse impact on a resource of Medium (County / Metropolitan) importance and the effects are considered to be **Moderate and likely to be significant**.

Reptiles

7.6.24 The site was found to support 'low' populations of both slow worm and common lizard. The open, undisturbed, well-drained nature of the site, presence of natural and artificial refugia, dense vegetation (tussocky grassland or scrub edges) and suitable south facing features make the site favourable for reptiles. These habitats provide both cover and basking habitats.

7.6.25 The population estimate also takes into consideration the size of the site, approximately 0.2 ha in total, as suitable habitat for reptiles. This is the total area suitable for reptiles that will be lost to the development, which includes rank semi-improved grassland, patches of ephemeral short perennial and scrub.

7.6.26 Suitable habitat for reptiles consisting of rank tussocky grassland also occurs adjacent to the site towards the east. This area is outside of the perimeter fence, is approximately 0.27ha in area, and will not be affected by the development.

- Therefore the loss of approximately 100% of the suitable reptile habitat would have a Major adverse impact on a resource of Low-Medium (District/Borough) importance and the effects are considered to be **Moderate and likely to be significant**.

Protected and notable plants

7.6.27 Primrose, a Devon BAP Priority Species was recorded on site in and around Blackies Wood. As most specimens were recorded within or on the edge of Blackies Wood, few will be lost to the development of the EfW CHP facility.

- Land take would have a Minor adverse impact on a resource of Low (Parish/Neighbourhood) importance and the effects are considered to be **Neutral and not significant.**

Terrestrial invertebrates

7.6.28 There were no desk study records for terrestrial invertebrates within the site. The habitats on site were not considered to be of sufficient importance to require a specialist invertebrate survey; furthermore the habitats have until recently been frequently disturbed through the use of the site for aggregate processing.

- Land take would have a Minor adverse impact on a resource of Low to Medium (District/Borough) importance and the effects are considered to be **Neutral and not significant.**

Summary of Significant Effects during the Construction Phase

7.6.29 Table 7.7. below summarises the potentially significant effects during the construction phase prior to the consideration of mitigation.

Table 7.7: Significant Effects During the Construction Phase

Feature	Conservation Value of Feature	Nature of Impact	Significance of effect (prior to mitigation)
Black redstart	Medium (County / Metropolitan) importance	Land take	Moderate adverse, likely to be significant
Reptiles	Low (Parish/Neighbourhood) - Medium (District) importance	Land take	Moderate adverse, likely to be significant
Running water	Low (Parish/Neighbourhood) importance	Replacement of two culverts with one clear span bridge	Moderate beneficial, likely to be significant

Impacts During the Operational Phase

Designated sites

Chimney emissions

7.6.30 The results of the dispersion modelling assessment to predict the impact of emissions on sensitive ecological receptors is given within Chapter 13. The full results of the dispersion modelling for the sensitive ecological receptors due to acid deposition, nutrient nitrogen deposition, NOx, SO_2, NH_3 and HF are presented in detail in Appendix 13.1.

7.6.31 This report has considered the relevant critical levels and critical loads. The critical level is the atmospheric concentration threshold above which damage to vegetation can result and is fixed

for all habitats (for example the critical level for NOx is 30 μgm^{-3}, while the critical level for SO_2 is 20 μgm^{-3}). The critical load relates to the quantity of atmospheric input to ecosystems (deposition) of nitrogen (causing nutrient enrichment or eutrophication) or pollutants which may acidify soils and freshwaters (causing acidification) below which damage is known not to occur and differs from habitat to habitat based on their relative vulnerability. In all cases, the critical load selected for comparison was that associated with the most vulnerable habitat for which the site was designated.

7.6.32 Ground-level concentrations of the modelled pollutants relevant to sensitive ecological receptors have been predicted at 41 locations, as listed in Table 3.6 of the Air Quality Dispersion Modelling Report. The locations of these receptors are also shown in Figure 4.2 of Appendix A of the Air Quality Dispersion Modelling Report. These locations cover all designated sites (statutory or non-statutory) within 2km of the EfW CHP facility location for which 'interest features' were available[4] and all internationally designated sites within 10km, in line with standard Environment Agency guidance and as agreed with Natural England. Although South Dartmoor Woods SAC is actually located 10.4km from the EfW site, it was also covered by the air quality assessment, as agreed with Natural England.

7.6.33 The 41 locations were selected in order to represent known locations where the most vulnerable habitats for which the sites were designated are known to be located. So for example the locations for modelling impacts on Plymouth Sound & Estuaries and Tamar Estuaries Complex SPA focussed upon the margins of these sites where large areas of intertidal habitat and mudflat are to be found rather than on the large areas of open water below low tide, where the site's sensitivity will be much lower and nutrient inputs will be dominated by marine or fluvial sources rather than deposition from air.

7.6.34 Most of the interest features for which Plymouth Sound & Estuaries SAC was designated are either not vulnerable to changes in air quality (i.e. reefs, sub-tidal sandbanks and Allis shad) or are too broadly defined for empirical critical loads to be available and deposition impacts to be evaluated (i.e. 'estuaries' or 'large shallow inlets and bays'). As such, the assessment of deposition was based upon the most sensitive habitat for which the site was designated and an empirical critical load was available – saltmarsh, which has a critical load of 30-40 kgN/ha/yr and is used in the UK Air Pollution Information System as a proxy for other marine/intertidal habitats for which the SAC was also designated such as mudflat. This is also the most sensitive habitat utilised by the species for which the Tamar Estuaries Complex SPA and Tamar-Tavy Estuary SSSI were designated.

7.6.35 Critical Levels are independent of the habitats present on site, but critical loads differ depending upon the habitats involved. For this appraisal, the following habitats were used to determine the appropriate critical loads against which impacts could be assessed.

Site	Habitat used to establish critical loads
Plymouth Sound & Estuaries SAC	Saltmarsh/mudflats
Tamar Estuaries Complex SPA	Saltmarsh/mudflats
South Dartmoor Woods SAC	Old sessile oakwoods

[4] Although there are two further locally designated wildlife sites within 2km of the EfW facility (Ernesettle Battery Field Unidentified Wildlife Site (UWS) and Ernesettle Abandoned Playing Field UWS) neither of these sites has specific 'interest features' being designated simply for their wildlife value in broad general terms. Therefore critical loads cannot be determined for these sites.

Tamar-Tavy Estuary SSSI	Saltmarsh/mudflats
Kinterbury Creek County Wildlife Site	Saltmarsh/mudflats
Ensettle Complex County Wildlife Site	Deciduous woodland

7.6.36 Specific significance criteria relating to impacts on sensitive designated ecological receptors are set out within the Environment Agency H1 guidance[5]. The impact of chimney emissions can be immediately disregarded as insignificant if:

- The Process Contribution (PC) amounts to less than 1% of the critical level/load; or if greater than 1% then
- The Predicted Environmental Contribution (PEC) is less than 70% of the critical load or critical level.

7.6.37 The results of the dispersion modelling of predicted impacts on sensitive ecological receptors are presented in Tables 5.9 to 5.15 of the Air Quality Dispersion Modelling Report. The tables set out the predicted PC to atmospheric concentrations of NO_X, SO_2, NH_3 and HF, and also acid deposition and nutrient nitrogen deposition.

7.6.38 The assessment reported in the Air Quality Dispersion Modelling Report shows that the predicted impacts for most sites are within the criteria for insignificance at all of the selected receptors, having a PC below 1% in most cases and a PEC below 70% in the few instances where the PEC exceeds 70%. Significant adverse effects on most sites are therefore unlikely and can be dismissed.

7.6.39 Only one site had a PC above 1% and a PEC above 70% - Ernsettle Complex County Wildlife Site, where the PC to total acid deposition is predicted to be just above 3% of the critical load, while the PC to nutrient nitrogen deposition predicted to be 2.5% of the lower bound critical load. In both cases, baseline deposition rates are already in excess of the critical load without the contribution of the facility (100% for acid deposition and 260% for nutrient nitrogen). However, even if the PEC is greater than 70% of the critical level/load this does not mean that a significant adverse ecological effect will result, but in such circumstances consideration will need to be given to the relative vulnerability of the site, current deposition levels and its relative ecological importance in determining whether the additional deposition will be of significance.

7.6.40 In the case of Ernsettle Complex CWS, the PC for nitrogen deposition is 0.25 kgN/ha/yr; this must be considered within the context of a background deposition rate of 26.2 kgN/ha/yr. As such, the EfW facility will only contribute an additional 0.09% on top of background nitrogen deposition. This is sufficiently small that its impact on the vegetation within the site will be imperceptible. Equally, for acid deposition the PC will be 0.05 keq ha^{-1} $year^{-1}$ compared to a background deposition rate of 1.87 keq ha^{-1} $year^{-1}$, meaning that the EfW CHP facility will only contribute an additional 2.5% above background acid deposition.

7.6.41 Furthermore, it should be noted that the assessment has been undertaken based on the modelling of emissions at Waste Incineration Directive (WID) limits for the pollutants considered in the prediction of impacts on ecological sites. In reality long term emissions from facilities such as this one are often well below WID limits for many pollutants. For this reason, it is likely that the actual impacts will be even lower than those presented here. As such this is considered to be

[5] Environment Agency (2010) Horizontal Guidance Note H1 – Annex (f), v2.2, August 2010

a Minor adverse impact on a site of Medium (county) value, resulting in an effect that is not significant.

7.6.42 At the request of PCC officers the Dartmoor SAC has also been considered. Dartmoor SAC was not specifically modelled since it lies 15km from the EfW facility. However since atmospheric emissions from the EfW plant are negligible for internationally important sites located considerably closer to the Energy from Waste facility (e.g. Plymouth Sound & Estuaries SAC, South Dartmoor Woods SAC), the EfW facility is likely to make a negligible contribution to deposition on this SAC.

7.6.43 Air quality impacts on designated sites can therefore be considered insignificant and do not require mitigation.

Water

7.6.44 There is potential for operational site activities to impact on the water environment, for example through accidental spills of hydrocarbons or other chemicals. The assessment of hydrological impacts of operational activities (ES Chapter 11) has not identified significant effects on designated marine sites, the closest of which is located approximately 600m to the west.

7.6.45 Drainage from hardstanding areas will be discharged via a Class 1 Oil Separator and an isolation valve will be provided on the discharge outfall to control any discharge in critical events.

- The impact of operational activities on the water environment would have a Neutral adverse impact on a resource of Very High (International) importance and High (National) importance and the effects are considered to be **Neutral and not significant**.

Noise

7.6.46 Permanent noise from the EfW CHP facility is not expected to impact upon breeding and wintering birds of the Tamar-Tavy Estuary SSSI located approximately 600m west, or other internationally and nationally-designated sites further afield. The propagation of noise from the facility has been modelled for the noise assessment and the results can be seen in Chapter 14. Furthermore, the wider dockyard already generates noise at a number of locations from a number of activities, many of which are directly adjacent to the SSSI.

- Therefore noise from the development would have a Neutral impact on a resource of High (National) importance and the effects are considered to be **Neutral and not significant.**

Lighting

7.6.47 The EfW CHP facility will include the following light sources:

- External lighting in the trafficked areas around the site to enable safe passage of vehicles;
- Architectural lighting on the south-eastern façade (not adjacent to Blackies Wood);
- Internal lighting within the administration building, some of which may spill out through the windows during office hours in early evenings in winter; and
- Internal lighting within the control room, some of which may spill out through the windows every night since staff will be present in the control room 24 hours per day.

7.6.48 Some of this lighting will be located along the side of the EfW CHP main building adjacent to Blackies Wood which may cause an alteration or disruption to birds' diurnal activity patterns. However, there are already lights fitted to the security fence separating Blackies Wood from the main part of the site where the EfW CHP facility main building will be constructed; although these lights will no longer be required.

- The development would have a Minor adverse impact on a resource of Low to Medium (District/Borough) importance and the effects are considered to be **Neutral and not significant**.

Species

Bats

7.6.49 As noted above, some lighting will be located along the side of the EfW CHP main building adjacent to Blackies Wood although there are already lights fitted to the security fence separating Blackies Wood from the main part of the site where the EfW CHP facility main building will be constructed which will no longer be required. Long-eared, common pipistrelle, lesser horseshoe, noctule, serotine and soprano pipistrelle bats have been recorded within 2 – 4 km of the site. Artificial lighting has been shown to have a positive effect on small foraging bats such as pipistrelles as the light attracts insects that the bats prey on. Operational lighting will favour any hawking bats present, such as pipistrelles. However, gleaning bats, such as brown long eared bats and also lesser horseshoe bats, prefer darker conditions, so if any are present they may experience some disturbance from the new lighting.

- Therefore the development would have a Moderate adverse impact on a resource of Low (Parish / Neighbourhood) importance and the effects on bats are considered to be **Moderate to Low and therefore potentially significant**.

Otter

7.6.50 The watercourses that occur adjacent to the site and outside of the development footprint contain suitable habitat for otter. However, due to the restricted access from the Tamar Estuary they are considered unlikely to be utilising this habitat on anything other than an occasional basis. During the operational phase there would be no change from that of the baseline levels in relation to potential disturbance to otters.

- Therefore the development would have a Neutral impact on a resource of Low to Medium (District/Borough) importance and the effects are considered to be **Neutral and not significant**.

Breeding and wintering birds

7.6.51 The habitats found on site are likely to provide suitable nesting, roosting, foraging and over wintering habitats for a variety of bird species. Most species recorded were widespread and common across the site. The value of the site to birds was variable. Typically, the more valuable habitats in terms of species diversity and presence of the more local species included the scrub, woodland and waterside habitats.

7.6.52 During the operational period, noise disturbance will be an additional impact on any breeding and wintering birds present.

- The development would have a Minor adverse impact on a resource of Low to Medium (District/Borough) importance and the effects are considered to be **Neutral and not significant**.

7.6.53 As noted above, some lighting will be located along the side of the EfW CHP main building adjacent to Blackies Wood, which may cause an alteration or disruption to birds' diurnal activity patterns.

- The development would have a Minor adverse impact on a resource of Low to Medium (District/Borough) importance and the effects are considered to be **Neutral and not significant**.

Summary of Significant Effects during the Operational Phase

7.6.54 Table 7.8. below summarises the potentially significant effects during the operational phase prior to the consideration of mitigation.

Table 7.8: Significant Effects During the Operational Phase

Feature	Conservation Value of Feature	Nature of Impact	Significance of effect (prior to mitigation)
Bats	Low (Parish / Neighbourhood)	Light disturbance	Low to moderate adverse, potentially significant

7.7 Mitigation and Monitoring

Construction Good Practice

7.7.1 Good practice should be undertaken during the construction phase, and be incorporated into the Construction Environmental Management Plan (CEMP), including:

- Dust minimisation methods (*e.g.* wetting of dust-producing plant and machinery, covering of all vehicles carrying spoil) to avoid impacts on retained vegetation, in particular Blackies Wood BNF.
- Night working should be avoided wherever possible and all construction lighting should be directed away from retained areas of habitat. Security lighting and non-essential lighting should be fitted with automatic cut-off switches.
- Where works within and in close proximity to watercourses are to be conducted, namely the removal of the culverts and construction of the bridge, pollution prevention controls should be utilised to reduce the risk of sediment pollution resettling further downstream and potentially smothering benthic habitats. It is understood from the civils contractor Kier (see Appendix 6.5) that the following measures will be put in place. During these works the stream and its banks will be continually monitored to prevent any material falling in. During the excavation a containment bund will be incorporated into the excavation to stop any silty water in the excavation entering the stream. The excavation shall be kept dry at all times using a 'silent' pump so that even between shifts there will be no chance of water over-topping the bund. The discharge from the excavation will be sent to a 'Silt-Buster'

settlement tank and the discharge from this will be regularly monitored for turbidity and other pollutants before it enters the stream.

- All clearance works, tree felling and scrub removal should be undertaken outside the bird nesting season (i.e. will be undertaken during the period September – February), although if works cannot be avoided during the nesting season (March – August) then an ecologist should supervise any works.

Brown Roof

7.7.2 A brown roof is to be included on the workshop building, largely to mitigate for the loss of over-wintering black redstart habitat. The roof will be 0.045 ha (450 m^2) in area. The brown roof material will utilise the soil and spoil from the immediate area to provide a growing medium. It will use different local substrates, *e.g.* gravel in one area, topsoil in another area, and crushed concrete in another area. This effectively provides a number of different environments on the rooftop, each favouring different species, in particular the black redstart. This will also create habitats for a wider range of plant and invertebrate species on the rooftop maximising biodiversity.

Ecological Enhancement of the Existing Landscape

7.7.3 The existing Blackies Wood habitat will be managed to promote the wildlife which already exists. Landscape design will incorporate native planted woodland and shrubs that will represent the existing landscape character; the creation of wildlife corridors; the reinstatement of an existing ditch to connect to a newly created freshwater pond; areas of open species-rich neutral grassland and bird, bat and insect boxes. An Ecological Management Plan, describing the management proposals for these areas can be found in Appendix 7.7.

7.7.4 The opportunity will also be taken to clear up certain aspects of the local terrestrial and aquatic environment, for example removal of the litter.

Treatment and Eradication of Japanese Knotweed

7.7.5 The Japanese knotweed within Blackies Wood BNF and on the slopes of Table Top Mountain (outside the site boundary but adjacent to the construction compound) will be treated and eradicated to halt the spread of this invasive species.

Reptiles

7.7.6 Reptile translocation will be undertaken following best practice guidance prior to the commencement of construction. Reptiles will be moved to a suitable receptor habitat adjacent to the site. The receptor site is approximately 0.27ha in area and is located adjacent and to the east of the site. Part of the receptor site (c. 0.06ha) will need to be cleared of scrub. Habitats comprise rank tussocky grassland with scrub edges and plenty of basking and hibernation opportunities. It is anticipated that the receptor site will be sufficiently large enough to cope for the number of translocated reptiles. In addition, habitat creation and enhancement will be undertaken within the receptor site to improve the habitat for the benefit of reptiles.

7.7.7 Four reptile hibernacula will be constructed within the 'receptor site'. These will consist of shallow excavations approximately 0.5 -1 m deep lined with logs, brash, dead wood stone/rocks and covered in a layer (approximately 100mm) of earth. The hibernacula will have a dimension of approximately 3 m by 2 m.

7.7.8 The uneven terrain of the site makes it difficult to erect temporary reptile fencing in the conventional way. Therefore it is suggested that temporary reptile fencing is erected on the inside of the perimeter fence in the east of the site.

7.7.9 Due to the estimated size of the population and due to the fact that the fencing is to be erected in an unconventional manner, a minimum of 60 days of trapping will be required to translocate the reptiles.

7.7.10 One hundred artificial refugia corrugated roofing 'bitumen' tins (approximately 0.5 x 0.5m) should be used per hectare. These will be placed approximately five metres apart, concentrating on locations that are attractive to reptiles (*e.g.* sunny areas adjacent scrub, south facing etc.). The tins are used to attract reptiles for basking and shelter so they can be caught, removed and translocated. All reptiles which are caught will be placed in large containers and translocated to the receptor site close to where they were originally captured.

7.7.11 The tins will left in-situ for over 60 days and checked once a day within a temperature range of between 10 - 16°C and under suitable weather conditions. All 'trapping' will be undertaken during April to August 2011 in order to coincide with reptiles' active seasonal period.

7.7.12 Once the full trapping period is completed the main site should be cleared and any vegetation strimmed to a height of 100mm and the cut material hand raked to the sides of the area. Vegetation clearance will be undertaken in a phased and controlled manner using hand-held machinery and under ecological supervision. Ecologists will undertake a 'finger-tip' search for reptiles along a chosen route within the area to be cleared. This will encourage reptiles, if any remain following trapping, to vacate these areas of their own volition to adjacent areas. Soil, stones, roots, mammal holes etc. will be checked for reptiles by hand investigation. If any reptiles are encountered they will be moved to the translocation receptor site. All strimming of vegetation will commence in one corner working outwards towards the periphery of the development footprint.

7.7.13 If the site is not immediately subject to site clearance, it is important to ensure that reptiles do not recolonise the site. This may be achieved either by maintaining the reptile fence carefully or, preferably, the vegetation should be maintained at 100mm to discourage re-use by reptiles.

7.7.14 The receptor site grassland habitat will require maintenance to maintain its suitability for reptiles. A single cut to approximately 100mm once a year in November will achieve this.

7.7.15 The Reptile Survey in Appendix 7.5 provides a method statement for reptile translocation and pre-construction vegetation clearance.

Wildlife Pond

7.7.16 A wildlife pond is proposed within Blackies Wood; details are shown on Figures 6.1 and 6.2. The pond will have gently sloping sides to allow easy access for wildlife and will vary in depth to allow colonisation by a range of flora and fauna; the maximum depth of the pond will be approximately 1m. Stones and boulders will be placed at the southern end of the pond to create microhabitats.

Marine Intertidal Baseline Survey

7.7.17 At the request of the Environment Agency, a Marine Intertidal Baseline Survey of Weston Mill Lake and tributaries will be undertaken in May 2011 – September 2011. Subsequently the marine intertidal area will be monitored for five years. There was insufficient time after receipt of

the EIA Scoping Opinion in July 2010 and the subsequent discussions in the months that followed to do the surveys in 2010. Nevertheless, the purpose of this survey is to establish a baseline against which any possible unpredicted impacts during the construction phase can be monitored; in particular the demolition of the culverts and construction of the bridge.

7.7.18 A marine phase I intertidal habitat (biotope) survey will be undertaken to obtain baseline data on intertidal habitats present. Two visits will be undertaken during May – September, which is optimum time for survey following appropriate guidance (CCW, 2006).

7.7.19 Phase II marine surveys will also be undertaken during May – September for intertidal soft sediment macro infauna. Several stations will be chosen and an area of approximately 1m² will be dug, to about 30cm deep, by which any macro fauna will be separated and counted to provide an estimate of abundance.

7.7.20 Data on fish species present will be obtained with the aid of a shore-based seine net deployed at various positions within the creek at low water. A stop net will also be deployed at high water on an ebbing tide to catch migratory fish species within the creek. This will be positioned across a narrow part of the creek adjacent to the culvert or as close as possible. Any fish caught will be put into aerated tanks to then be re-released in a suitable area. Several bait traps will be positioned within points of relevance within the creek, due to the concern of otter potentially becoming trapped within these; the entrance to all traps will not exceed 95mm in diameter, if this is not the case then otter guards will be used to prevent otters accessing the traps. Two visits will be undertaken between May to June and again during September to October. None of the traps will be left unattended throughout the day and all species will be returned alive close to where they are caught.

7.7.21 Before any trapping/netting commences, consent for all netting and trapping methods will be applied for to the Environment Agency (Fisheries Recreation and Biodiversity team). This would be consent for scientific netting and trapping and requires dispensation by the Environment Agency from the Tamar Estuary no netting restrictions. Permission from the Devon Sea Fisheries Committee will also need to be sought.

7.7.22 Biotope (thematic) maps will be produced for the site and associated intertidal areas with the aid of nautical charts and GIS. Field methodologies and data collection will follow standard protocol developed by the Marine Nature Conservation Review (MNCR) (Hiscock, 1996). Biotopes are habitats and their associated biological communities. Biotopes will be assessed using the biotope classifications produced by the Joint Nature Conservation Committee (JNCC), which is available on the internet (Connor *et al.*, 2004).

7.7.23 The baseline field data and maps will be submitted to Plymouth City Council during the course of the determination of the planning application.

7.7.24 Prior to construction work commencing, a more detailed Construction Environmental Management Plan (CEMP) will be produced (the version at Appendix 6.3 is an Outline CEMP). The CEMP will give details of the surface water monitoring to be undertaken during construction and the actions to be taken if the results from the monitoring differ from the baseline. The CEMP will identify specific trigger levels for each parameter, above which actions will be required.

Lighting

7.7.25 The lighting design will minimise the impacts of light spillage on adjacent retained habitats and species such as bats through the attachment of directional hoods to lights and the use of low pressure sodium lamps. Non-essential lighting will be fitted with automatic cut-off switches. The existing lighting fitted to the security fence separating Blackies Wood from the main part of the site where the EfW CHP facility main building will be constructed will no longer be required.

7.8 Residual Effects (with Mitigation)

Table 7.9: Residual Effects During the Construction Phase

Feature	Conservation Value of Feature	Nature of Impact	Mitigation	Significance of effect (after mitigation)
Black redstart	Medium (County / Metropolitan) importance	Land take	Brown roof	Neutral and not significant
Reptiles	Low-Medium (District/Borough) importance	Land take	Translocation and habitat enhancement and creation	Neutral and not significant
Blackies Wood	Low-Medium (District/Borough) importance	Ecological enhancement	n/a	Beneficial, moderate significance
Japanese knotweed	n/a	Existing presence	Treatment and eradication	Beneficial, low significance
Running water	Low (Parish / Neighbourhood) importance	Two existing culverts	Clear span bridge replacement	Beneficial, moderate significance

Table 7.10: Residual Effects During the Operational Phase

Feature	Conservation Value of Feature	Nature of Impact	Mitigation	Significance of effect (after mitigation)
Bats	Low (Parish / Neighbourhood)	Light disturbance	Positioning of lighting systems away from sensitive areas and suitable specification of lighting	Neutral and not significant

7.9 Conclusion

7.9.1 Information has been gathered to ascertain the presence or absence of habitats and protected species at the site and in its vicinity. The EfW CHP development has the potential to create adverse and beneficial effects on biodiversity, including habitats, reptiles, bats, and breeding and wintering birds including black redstart. Assuming that the habitat creation, mitigation measures and surveys specified are carried out in advance and/or as part of future works (as applicable), the residual adverse effects on biodiversity are expected to be not significant. There are also expected to be beneficial effects on biodiversity in respect of the enhancements proposed to

Blackies Wood and the replacement of a culverted watercourse crossing with a new clear span bridge.

7.10 References

Altringham, J.D., 2003. British Bats. Harper Collins, London.

Anon (2004) Reptiles: Guidelines for Developers. English Nature, Peterborough, UK.

Bat Conservation Trust 2007. *Bat Surveys-Good Practise Guidelines.* Bat Conservation Trust, London.

Bat Conservation Trust 2007. *Bats and Trees in England*. Bat Conservation Trust, London.

Bibby, C.J., Burgess, N.D., Hill, D.A. and Mustoe, S.H. (2000) Bird Census Techniques, 2nd Edition.

British Trust for Ornithology (BTO) http://www.bto.org/ Accessed 21st July 2010.

Connor DW, Allen JH, Golding N, Howell KL, Lieberknecht LM, Northen KO and Reker JB (2004). *The Marine Habitat Classification for Britain and Ireland*, Version 04.05. JNCC, Peterborough.

Countryside Council for Wales (2006) *Handbook for Marine Intertidal Phase I Biotope Mapping Survey.*

Davies J *et al.* (eds) (2001). Natura 2000: *Marine Monitoring Handbook*. JNCC, Peterborough.

Department for Communities and Local Government (2005). *Planning Policy Statement 9: Biodiversity and Geological Conservation*. The Statutory Office, London.

Department of Environment, Food and Rural Affairs (Defra) (2007) *Conserving biodiversity – the UK approach*. Defra. Available at http://www.ukbap.org.uk/library/UKSC/DEF-PB12772-ConBio-UK.pdf

Devon Biodiversity Action Plan (2009 -2010 update).

Eaton, M.A., Brown, A.F., Noble, D.G., Musgrove, A.J., Hearn, R.D., Aebischer, N.J, Procter, D.A., Gibbons., Evans. A., and Gregory, R.D., (2009) Birds of Conservation Concern 3. *The population status of birds in the United Kingdom, Channel Islands and Isle of Man*. British Birds 102: June 2009 296-341.

Entwistle, A. *et al.* 2001. *Habitat Management for Bats: A Guide for Land Managers, Land Owners and their Advisors*. JNCC, Peterborough.

Froglife (1999). Froglife Advice Sheet 10: *An introduction to planning, conducting and interpreting surveys for snake and lizard conservation.* Froglife, Halesworth.

Gent, A.H. and Gibson, S.D. (eds.) (1998). *Herpetofauna Workers' Manual*. Peterborough, UK: Joint Nature Conservation Committee. Peterborough, UK.

Gibbons D. W., Avery M.I., Baillie, S.R., Gregory, R.D., Kirby, J., Porter, R.F., Tucker, G.M. and Williams, G. (1996). *Bird species of conservation concern in the United Kingdom, Channel Islands and Isle of Man: Revising the Red Data List.* RSPB Conservation Review 10: 7-18.

Gilbert, G., Gibbons, D.W., and Evan, J. (1998). *Bird Monitoring Methods*.

Herpetofauna Groups of Britain and Ireland advisory notes for amphibian and reptile groups (ARGs) (1998). *Evaluating local mitigation/translocation programmes: Maintaining best practice and lawful standards*. Halesworth, UK: HGBI, c/o Froglife. Unpublished Report.

Hiscock K (ed) (1996). *Marine Nature Conservation Review: Rationale and Methods Series*. JNCC, Peterborough.

Institute of Ecology and Environmental Management (IEEM) (2006). *Guidelines for Survey Methodology.* IEEM, Winchester.

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 of Environmental Assessment (1995). *Guidelines for Baseline Ecological Assessment.* E & FN Spon.

Joint Nature Conservation Committee (JNCC) (2007). *Handbook for Phase I Habitat Survey: A technique for environmental audit*. 2nd edition. JNCC: Peterborough. 80pp.

Jones, J. 2000. *Impact of Lighting on Bats*. Unpublished report.

Marchant, J. (1983). *BTO common birds census instructions*. Maund & Irvine Ltd., Tring.

Mitchell, A. J., and McLeish, A. P. 2004. *Bat Workers Manuel*, 3rd edition, JNCC, Peterborough.

Multi-Agency Geographic Information for the Countryside www.magic.gov.uk: Accessed on 14th September 2010.

National Biodiversity Network Gateway: Accessed on 14th September 2010. http://www.searchnbn.net.

Nature on The Map: Accessed on 14 September 2010 www.natureonthemap.org.uk.

Office of the Deputy Prime Minister (2005a) *Planning Policy Statement 9: Biodiversity and Geological Conservation*. HMSO. Available at: http://www.communities.gov.uk/documents/planningandbuilding/pdf/147408.pdf

Office of the Deputy Prime Minister (2005b) Government Circular: Biodiversity and Geological Conservation – Statutory obligations and their impact within the planning system. HMSO. Available at: http://www.communities.gov.uk/documents/planningandbuilding/pdf/147570.pdf

Plymouth City Council (2007). *Core Strategy Development Plan Document.*

Reading C .J. and Jofré G. M. (2009) Habitat selection and range size of grass snakes *Natrix natrix* in an agricultural landscape in southern England. *Amphibia-Reptilia* 30:379-388.

Reading, C.J. (1996) *Evaluation of Reptile Survey Methodologies*. Final report. English Nature Research Report No. 200. English Nature and Institute of Terrestrial Ecology.

Stace, C. (1997). *New Flora of the British Isles*. Cambridge University Press.

Strachan, R. and Moorhouse, T. (2006) *Water Vole Conservation Handbook* (2nd Ed) Wildlife Conservation Research Unit, University of Oxford.

UK Biodiversity Action Plan (UK BAP) (2007). UK Biodiversity Action Plan website: http://www.ukbap.org.uk . Accessed 25th September, 2010.