Argyll and Bute Planning Service

A BIODIVERSITY TECHNICAL NOTE FOR PLANNERS AND DEVELOPERS

February 2017

Argyll Bute COUNCIL

A Biodiversity Technical Note for Planners and Developers

Biodiversity encompasses the whole variety of life, it is all living thing- from the tiny garden ant to the giant redwood tree. You will find biodiversity everywhere, in window boxes and wild woods, roadsides and rain forests, snowfield and seashore.

The UK Steering Groups Report 1995

Biodiversity and Sustainable Development.

The difference between Nature and Biodiversity is that Nature is an abstract idea – it carries a value judgement (beauty in the eye of the beholder) whilst Biodiversity is an objective concept – with physical attributes that help make something beautiful, it rates all species and habitats equally and is a key indicator of sustainable development.

Contents

1.0 Introduction

The Argyll and Bute Council as the Planning Authority wish to encourage high quality development which will make a positive contribution to our high quality biodiversity and local environment. This Technical Note has been approved by the Planning, Protective Services and Licensing Committee. In order that the council may make an informed decision on your planning application, appropriate information, such as details of surveys, and any measures to be taken to avoid, mitigate or compensate for impacts from the proposed development should accompany the application.

1.1 The Purpose of this Technical Note

The purpose of the Biodiversity Technical Note for Planners and Developers is to guide planners and to provide guidance to developers and householders thinking about new-builds, renovations or extensions of the material considerations which shall be taken into account to ensure that they meet the requirements to address and protect biodiversity in the planning and development process. It provides an insight into the European, National and the Local biodiversity (further details in Appendix 1, Appendices 4.5, 4.6 and 4.7) and includes the legal implications with supporting information on incorporating biodiversity objectives into a development. One of the key elements of this document is the Biodiversity Checklist and the Checklist for Invasive Non-Native Species (see Appendix 1) which is an initial field guide to aid the basic assessment of a proposed site and to provide a steer on what opportunities there are to protect and enhance biodiversity and what needs further survey work to inform the process and type of development.

This Technical Note reflects the Local Development Plan SG LDP 3 ENV 1 policy, the legislation for the protection and integration of European[1], National[2] and Local habitats and species into planning in and around areas for development. This will assist in the promotion of biodiversity as a consideration for all proposals, plans and policies which is one of the key objectives of the Scottish Biodiversity Strategy as well as an indicator of sustainable development,

SG LDP ENV 1 – Development Impact on Habitats, Species and our Biodiversity

(A)) When considering development proposals Argyll and Bute Council will give full consideration to the legislation, policies and conservation objectives, contained within the following:-

(i) Habitats and Species listed under Annex I, II & IV of the Habitats Directive;
(ii) Species listed under Annex I & II of the Birds Directive and Red and Amber status in 'Birds of Conservation Concern';
(iii) Article 10 Features under the Habitats Directive;
(iv) Wildlife and Countryside Act 1981; (and as amended by the Nature Conservation (Scotland) Act 2004); Species listed on Schedules 1, 5, 7, 8, 9 and 14;
(v) Wildlife and Natural Environment (Scotland) Act 2011. A Code of Practice on Non-Native Species supports this Act;
(vi) Protection of Badgers Act 1992

(B)) When considering development proposals the Council will also seek to contribute to the delivery of the objectives and targets set by the Local Biodiversity Action Plan (LBAP) and the Scottish Biodiversity Strategy. Proposals that incorporate and safeguard existing site interests within the design wherever possible will be encouraged. Applications for medium and large scale developments will be required to complete a biodiversity checklist.

Where there is evidence to suggest that a habitat or species of European, national and/or local importance exists on a proposed development site or would be affected by the proposed development, the Council will require the applicant, at his/her own expense, to submit a specialist survey of the site's natural environment, and if necessary a mitigation plan, with the planning application.

Development proposals which are likely to have an adverse effect on protected species and habitats will only be permitted where it can be justified in accordance with the relevant protected species legislation.

[1] European Protected Species
[2] Protected Species

1.2 Who is the Technical Note for?

The Biodiversity Technical Note should be used:

- As guidance for planners; and
- For developers and householders thinking about new-builds, renovations or extensions in order to advise of their responsibilities to protect and enhance biodiversity.

Pre-application advice

Argyll and Bute Council welcomes and encourages discussions before a planning application is submitted. Such liaison can assist in better quality applications, which meet the criteria and increase the chances of a successful outcome

There are considerable benefits in seeking advice before making an application:

- It gives you the opportunity to understand how policies and guidance will be applied to your development,
- It can identify at an early stage where there is a need for specialist input, for example biodiversity (priority habitats and species), ecology, landscape planning etc.
- It may lead to a reduction in time spent by your professional advisors in working up proposals, identifying potential problems and sorting them out before an application is submitted
- It may indicate that a proposal is completely unacceptable, saving you the cost of pursuing a formal application
- It will ensure that you provide all the necessary information and drawings to enable the application to be registered as validated.

Link to Local Development Plan: https://www.argyll-bute.gov.uk/ldp

1.3 How to use the Technical Note

Biodiversity, Planning & Development

Planning, development and biodiversity conservation can work together by considering the local landscape and topographical integrity, national and local planning policies, relevant legislation, the Argyll & Bute Local Biodiversity Action Plan and the Scottish Biodiversity Strategy.

It is imperative that developers seek advice on Biodiversity issues and objectives by liaising with the Local Biodiversity Officer through the lead Planning Officer and in the National context, Scottish Natural Heritage as a Statutory Consultee, so that biodiversity is included as key component to design appropriate and ultimately build quality developments.

The flow chart below is a step by step guide on how to use this Technical Note and Toolkit

Step 1. Biodiversity Context

Biodiversity Guidance for Planners and Developers to aid development choices; information on International, European, National and Local habitats and species of importance and their legal context.

References - 1.4, 1.5, 1.6

Step 2. Practicalities

Considerations of particular importance to Developers:

Biodiversity Checklists, Survey and Mitigation Calendar - Appendix 4.1

Step 3. Development and Design

Consideration to incorporating biodiversity objectives including:

National Context - p6
Local Context – p7

Enhancement recommendations, Mitigation and Compensation.

Appendix 4.1

Step 5. Opportunities – Buildings and Biodiversity

Including Development Proposals

Appendices – 4.2 to 4.10 inclusive.

1.3 How to use the Technical Note

It is a requirement to consult with the relevant statutory authority i.e. Argyll and Bute Council, Scottish Natural Heritage before undertaking any operations potentially damaging to a designated or protected site.

It is also a requirement for developers to avoid or mitigate adverse effects if European Protected Species and Protected Species exist on the site.

Additional information on Protected Species: http://www.snh.gov.uk/protecting-scotlands-nature/protected-species/protected-species-az/

1.4 International Context

The Convention on Biological Diversity (CBD) is a legally binding international treaty to promote the following objectives:

- The conservation of biological diversity
- The sustainable use of its components; and
- The equitable sharing of benefits arising out of the utilization of genetic resources

The CBD is a legally binding instrument that aims to promote "the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising out of the utilization of genetic resources." A landmark in international law, the CBD establishes the principle of national sovereignty over natural resources. It recognises for the first time that the conservation of biological diversity is a common concern of humankind and an integral part of the development process. It covers all ecosystems, species and genetic resources, and also addresses the field of biotechnology, including technology transfer and development, benefit-sharing and biosafety. It sets policies and general obligations, and organizes technical and financial cooperation. Implementation, however, is required at the national level and responsibility rests with national governments.

The European Union (EU) is committed to the protection of biodiversity, and to halting biodiversity loss within the EU by 2020 and has listed Species that are afforded this protection as European protected.

The list is available in **Appendix 4.5** or on the SNH website http://www.snh.gov.uk/docs/B551085.pdf

Over the last 25 years the EU has built up a vast network of 26,000 protected areas in all the Member States and an area of more than 750,000 km^2, which is 18% of the EU's land area. Known as Natura 2000, it is the largest network of protected areas in the world, and a testament to the importance that EU citizens attach to biodiversity.

The legal basis for Natura 2000 comes from the Birds Directive and the Habitats Directive, which form the backbone of the EU's internal biodiversity policy but protected natural areas cannot thrive in isolation. If we want to conserve Europe's natural capital, then agriculture, energy and transport policies must be sustainable too because if any of these activities are likely to happen on a development site then a Regulation 44 licence application must be made to determine if they will be allowable. If a licence is not granted for these activities then they cannot take place without breaking the law. It should be noted that Scottish Natural Heritage (SNH) have been delegated the responsibility to issue these licences.

The following link will provide information on licensing for working with European protected Species:
http://www.snh.gov.uk/protecting-scotlands-nature/species-licensing/european-species-licensing/
See Appendix tbc for the list of European Protected Species and Protected Species.

1.5 National Context – Scottish Biodiversity Strategy

The aim of the Scottish Biodiversity Strategy:

> To conserve biodiversity for the health, enjoyment and wellbeing of the people of Scotland now and in the future.

The following objectives will assist in achieving this aim:

1. **Species & Habitats**- to halt the loss of biodiversity and continue to reverse previous losses through targeted action for species and habitats
2. **People**- to increase awareness, understanding and enjoyment of biodiversity and engage many more people in conservation and enhancement
3. **Landscapes & Ecosystems**- to restore and enhance biodiversity in all our urban, rural and marine environments through better planning, design and practice
4. **Integration & Co-ordination**- to develop an effective management framework that ensures that biodiversity is taken into account in all decision making
5. **Knowledge**- to ensure that the best new and existing knowledge on biodiversity is available to all policy makers

National Legislation. Further details can be found in **Appendix 4.6**

1.6 Local Context – Argyll & Bute Local Biodiversity Action Plan

'Argyll & Bute has some of the richest biodiversity in Scotland and some of the best in Britain' (Scottish Natural Heritage) - providing us with a wide range of the best examples in Land-use, Freshwater and Marine & Coastal habitats and species. The many natural influences that have shaped our landscape as well a s the myriad of man's activities make Argyll and Bute unique.

1.6.1 Argyll and Bute Local Biodiversity Objectives

Objectives:

The following objectives have been identified to protect and enhance biodiversity within Argyll and Bute and reduce the rate and effects of climate change:

- Conserve and enhance our existing biodiversity to ensure that it is robust and better able to cope with climate change;
- Protect and enhance existing carbon storing habitats (carbon sinks); peatlands and heathlands are good examples;
- Promote sustainable flood management through the protection and enhancement of wetland habitats;
- Improve connectivity between key habitats to facilitate the movement of organisms in response to climate change;
- Promote the use of green energy source; and
- Improve on existing decision-making tools for local planners to account for the effects of climate change on biodiversity and in assessing impacts of developments.

1.6.2 Land Use – Ecosystems: Lowland and Farmland, Upland, Woodland and Built Environment.

The terrestrial environment in Argyll and Bute is made up of a complex mosaic of forestry, hills and moorland, farmland and peatlands patterned by lochs and rivers. Argyll has a diversity of agricultural interests in the form of crofting, farming and estate management.

We also contribute to 20% of the broad-leaved forest cover on Scotland, although this only accounts for 2.6% of the land mass. It also has a high proportion of commercial forestry, 16% of Scotland's total, making up 21% of the regional land use. Over 50% of the rest of the region is a mosaic of heather moor/peatland, rough grassland and bracken scrub. A number of species associated with these habitats are the Golden Eagle (*Aquila chrysaetos*), and Black Grouse (*Tetrao tetrix*), and mammals such as the Red Squirrel (*Sciurus vulgaris*), Otter *Lutra lutra* and Pine Marten (*Martes martes*).

1.6.3 Freshwater Habitats and Species – Ecosystems

The freshwater environment in Argyll and Bute is varied, ranging from large lochs and rivers with medium water chemistries to tiny nutrient-poor, peat-stained lochans.

Argyll and Bute contains the longest freshwater loch in Scotland (Loch Awe - 41kms), and the loch with the greatest surface area (Loch Lomond - 71km2). Internationally important freshwater species exist in Argyll. The Freshwater Pearl Mussel (*Margaritifera margaritifera*), the Atlantic salmon (*Salmo salar*) and the Powan (*Coregonus lavaretus*) are three such species. These freshwater inhabitants are good examples of why Argyll is important for biodiversity, but also why action plans need to be established to protect these resources. All three species mentioned above are under severe threat from inappropriate activities which are threatening the existence of the Argyll & Bute populations.

1.6 Local Context – Argyll & Bute Local Biodiversity Action Plan

1.6.4 Marine and Coastal Habitats and Species – Ecosystems

The coastline of Argyll and Bute is one of its most outstanding scenic assets, attracting thousands of visitors annually from all over the world.

The convoluted nature of the coastline extends to just under 3,000 miles contains many habitats and species - some vitally important - and rare marine and coastal habitats which include the Northern Hatchet Shell and the strange and unique Serpulid reefs in Loch Creran. From a marine perspective, this area of the west coast of Scotland is very important for a wide range of marine life which supports a number of diverse interests, including fishing, diving, whale and dolphin watching and research. Apart from the ever increasing numbers of seals, twenty three species of whales and dolphins have been identified in British coastal waters, and all have been seen off Argyll & Bute. Some of the best areas to spot these animals on a regular basis is off the islands of Coll and Tiree. The most regular sightings are Basking Shark *(Cetorhinus maximus)*, Minke Whale (*Balaenoptera acutorostrata*) and Killer Whale (*Orcinus orca*), Common Dolphin (*Delphinus dephis*) and Harbour Porpoise (*Phocoena phocoena*).

Although these animals do not spend all year in Argyll and Bute waters, they are very important icons for biodiversity especially in light of a growing whale-watching tourist market increasing in the region. On shore, the habitats of the coastal region support many important animal and plant communities.

The world famous machair habitat is well represented in Argyll with 14% of the Scottish total, and equivalent to 10% of the world resource. This habitat is extremely important for a number of plants and animals, not least the Corncrake (Crex crex). The machair of Coll and Tiree is amongst the most important remaining strongholds for this globally threatened species. Other Argyll & Bute islands and parts of the mainland are also crucial in securing the recovery of this bird.

2.0 Biodiversity considerations of particular importance to Developers

2.0.1

In order to protect, maintain and enhance our local biodiversity we need planning applications to be accompanied by the correct information outlining the ecological impact of your proposed development will have. If you do not provide us with adequate information to allow us to fully consider your application, you run the risk of delays and possible refusal.

The Biodiversity Check List as shown in Appendix 4.1 provides a guide to as to when further ecological survey work may be required to accompany a planning application. It asks whether the site contains European Protected Species, designated site (either in or adjacent) biodiversity features for example trees, woodland, fresh water and coastal features and whether invasive non-native species are present.

The Biodiversity Check list provides a framework of assessing potential impacts and possible mitigation measures. It should be used to influence the design layout and inform ongoing habitat management.

Where mitigation or ongoing management of ecological features is required, the planning authority may attach conditions to a consent to ensure these are implemented.

In some cases where planning permission has been granted, developers may be required to carry out further ecological survey work in terms of pre- construction start checks to ensure compliance with the Wildlife & Countryside Act 1981.

When submitting a planning application you will need to consider if there are any ecological constraints on or likely to be affected by your proposal and think about the following issues:

1. Will the proposal involve impacts on European Protected Species?
2. Will the proposal impact on land designated for its nature conservation value either directly or indirectly?
3. Is it possible to design ecological enhancements into your proposal?

The Biodiversity Check List Appendix 4.1 should accompany any application, this tool will highlight any Biodiversity elements (habitats and species) for Ecological Surveys and where applicable focus effort on the eradication of Invasive Non-Native Species.



2.0 Biodiversity considerations of particular importance to Developers

2.0.2

If you think that there may be ecological issues on your site then you should talk to a qualified ecologist to get appropriate advice. A list of qualified ecologists is maintained by the Chartered Institute of Ecology and Environmental Management (CIEEM) please see their web site http://www.cieem.net for more information.

In order for the council to make an informed decision on your planning application you should provide the following information in support of your planning application:

1. Up to date surveys to an appropriate degree of detail carried out by a suitably qualified ecologist.
2. Where appropriate, information on how the development will avoid harming the species in its existing location.
3. Details of measures to enhance the provision of species within the development or create new additional opportunities for that species.
4. Details of mitigation measures employed to mitigate the harm caused by the development to that species where avoidance is not possible.
5. Details of the compensation measures to be provided where mitigation is not possible.

If you do not provide the appropriate level of information this can lead to significant delays in determining your planning application.

2.0 Biodiversity considerations of particular importance to Developers

2.1.3 Pre- Application Discussions.

It is important to liaise with the Planning department of Argyll and Bute Council to discuss any issues relating to biodiversity that maybe a material planning consideration.

https://www.argyll-bute.gov.uk/planning-and-environment

call 01546 605518 to be put through to the appropriate office

OBAN, LORN AND THE ISLES
Municipal Buildings, Albany Street, Oban, PA34 4AW
Email: planning.olandi@argyll-bute.gov.uk

MID ARGYLL, KINTYRE AND ISLAY
1A Manse Brae, Lochgilphead, PA31 8RD
Burnet Building, St John Street, Campbeltown, PA28 6BJ
Email: planning.maki@argyll-bute.gov.uk

HELENSBURGH AND LOMOND
The Helensburgh and Lomond Civic Centre,
38 East Clyde Street, Helensburgh, G84 7PG
Email: planning.handl@argyll-bute.gov.uk

BUTE AND COWAL
Milton House, Milton Avenue, Dunoon, PA23 7DU
Eaglesham House, Mount Pleasant Road, Rothesay, PA20 9HQ
Email: planning.bandc@argyll-bute.gov.uk

Other agencies such as Scottish Natural Heritage, Royal Society for the Protection of Birds, Scottish Wildlife Trust can be consulted to assist in getting an insight into the variety of habitats and species that may be present on the proposed site.

There is an onus to:

a) Protect designated sites of global, national or local importance for nature conservation
b) Resist development that would have adverse impacts on the population or conservation status of the following: European Protected Species and or Protected Species, and for both UK and Local Biodiversity Action Plan Species.
c) Take account of wildlife habitats in the consideration of planning applications
d) Ensure that development capitalises on opportunities to create, manage and enhance wildlife habitats and natural landscapes.

2.1.4 Incorporating Biodiversity into Development- see chart on Page 13.

Developers can ensure that they comply with biodiversity legislation (Appendix 4.1) by following a few important steps:
a) Consultation and Scoping Study – use the Biodiversity Checklist
b) Detailed surveys and environmental impact assessment – as appropriate to the type of planning application.
c) Design of development to incorporate biodiversity objectives
d) Enhancement, mitigation and compensation of biodiversity
e) Management and after care.

2.1.5 Consultation and scoping study

Developers should consult the planning authority along with statutory and non-statutory nature conservation organisations to ensure that they fully aware of any designations or conservation work in progress. Where no historic data exists for the site or data is inadequate or out of date, it is recommended that an ecologist is employed to undertake a scoping study to identify any biodiversity constraints and opportunities**.**

2.1.6 Detailed Surveys and Environmental Impact Assessment

Where, through the scoping study, it has been recognised that a site does or could support a habitat and relevant species or features such as trees, hedgerows, water, stonewalls etc. of biodiversity value, or has the potential for ecological enhancement, targeted and specific surveys should be undertaken to ensure accuracy and avoid potential dispute over results later in the development process.

2.1.7 Enhancement, mitigation and compensation

When undertaking design, ensure that best practice by accommodating biodiversity objectives recommended by the Royal Town Planning Institute are used. These are enhance, avoid harm, mitigate and where there is no alternative to compensate for biodiversity losses. This can be achieved through appropriate landscaping and integrating development features i.e. water features, 'green' roofs into the design (see Appendix 6.4). Where retention and enhancement cannot be achieved, mitigation or compensation must be considered as illustrated below:

Objective	Discussion
Retain, enhance or create features of nature conservation value and avoid harm	The design of all developments should look to incorporate and enhance the existing nature conservation features to allow for linking habitats thus preventing fragmentation.
Mitigate for impacts to features of nature conservation value	Mitigation should be considered where it is impossible to avoid all impacts to a feature of biodiversity value and also where impacts can be reduced through change in design or operation of the development. Information on protected species can be acquired from Scottish Natural Heritage – some species may require a license and if the developer is in contravention of any law. Where adverse effects are unavoidable, mitigation measures may take the form of conditions or planning obligations or management agreements.
Compensation for the loss of features of nature conservation	Where there is no viable alternative there should be compensation for the loss of a feature of nature conservation value. When considering compensation for habitat loss, the aim should always be to replace 'like for like' or better, bearing in mind that it should fit with the local landscape character and biodiversity.

2.1.8 Management during construction and aftercare.

The management of the site during construction should follow appropriate guidelines for protection of habitats and species including trees and features to be retained on site which will form part of the overall landscape plan with integrated biodiversity elements. A management plan for the maintenance of the site post-construction should include a biodiversity action plan. This plan will ensure that what is agreed at the planning stage is managed appropriately through surveying and monitoring methods to assess progress. This can be built into the overall maintenance plan as part of the contract. Developers should note that the larger the development particularly those subject to an Environmental Impact Assessment will require a Construction Environment Management Plan (CEMP) overseen by an Ecological Clerk of Works (ECOW).

3.0 Design of Development to incorporate Biodiversity Objectives

During the outline stage of the design for a major development[1], the nature conservation opportunities and constraints should be identified and worked into the master plan which should include an Environmental Statement under Environmental Impact Assessment Regulations. Smaller developments do not require this. Where little biodiversity interest has been identified on site, developers should aim to create features that are in keeping with the local or surrounding landscape.

This will provide an opportunity for wildlife to colonise the site. To assist with this aim, biodiversity objectives should be drawn, which are relevant and achievable within the development framework. These should be included in any outline planning permission application, along with baseline ecological information about the site. When the proposed development reaches the detailed design stage, there may be planning conditions relating to biodiversity, which will need to be fulfilled.

3.0.1

1. Scoping exercise / consultation
2. Detailed survey (EPS, PS) and Environmental Impact Assessment as
3. Design of development and incorporation of biodiversity objectives
4. Enhancement, mitigation and compensation for biodiversity
5. Management and aftercare

Site assembly	**Outline design**	**Detailed design**	**Construction**	**Operation**
Land / design team, feasibility study, purchase	Opportunities and constraints, masterplan, outline planning permission	Full planning permission, all EPS survey work completed	Works divestiture of development	Monitoring and Maintainance

[1] • All development under Schedule 1 of the EIA (Scotland) Regulations 1999.
• Housing proposals of 50 dwellings or more, or housing sites exceeding 2 hectares (ha).
• Business and general industrial, storage and distribution with a gross floor space of 10,000m2 or a site exceeding 2 ha.
• Electricity Generation where capacity is or exceeds 20 MW.
• Waste Management Facilities where capacity is or exceeds 25,000 tonnes per annum, or for sludge treatment facilities where capacity of or exceeds 50 tonnes (wet weight daily).
• Transport and Infrastructure where the road, railway, tramway, waterway, aqueduct or pipeline exceeding 8km in length.
• Fish Farming where the surface area of water covered exceeds 2 ha.
• Mineral Extraction where the site area is or exceeds 2 ha.
• Other Development not falling wholly within one of the above classes where the gross floor space is or exceeds 5,000m2 or a site area exceeding 2 ha.



3.1 Development Design considerations to incorporate Biodiversity Objectives

It is a requirement to consult with the relevant statutory authority i.e. Argyll and Bute Council, Scottish Natural Heritage before undertaking any operations potentially damaging to a designated or protected site.

It is also a requirement for developers to avoid or mitigate adverse effects if European protected species and Protected Species exist on the site. See http://www.snh.gov.uk/protecting-scotlands-nature/protected-species/ and **Appendix 4.5** for further information.

3.1.1 Key Process to Development Considerations for Biodiversity

1. SURVEY

a) If ecological surveys are required as a result of advice from Scottish Natural Heritage in terms of National interest, the Local Biodiversity Officer, or using the Biodiversity Check List- Appendix 4.1; it is important that survey work is carried out at the appropriate time of year, (see Ecological Survey Calendar) to ensure that adequate survey data is captured.

b) The level of detail will vary according to the size of the development and the habitats and species concerned.

c) Where protected or priority species are known or suspected, a detailed survey should be carried out by an Ecologist and included mitigation. .

d) The aim of the ecological surveys is to provide sufficient information to determine the impacts of the development before planning permission is granted.

e) Developments likely to have a significant impact on the environment require an Environmental Impact Assessment and should make provision for the employ of an ecologist clerk of works to monitor the site before, during and after works are completed. The Biodiversity Checklist must be used to inform the biodiversity and any invasive non-native species interests on the proposed development site.

2. PROTECT - EXISTING HABITATS AND SPECIES

a) Avoid adverse impacts to designated International, national or local sites and ensure that statutorily protected habitats and species are preserved.

b) Site layout and design should retain existing habitat features of benefit to wildlife, including the Argyll and Bute Local Biodiversity Action Plan habitats and species.

c) It is important to keep features in context rather than as an isolated habitat fragments.

3. MITIGATE – AGAINST POTENTIALLY ADVERSE EFFECTS

a) Minimise damage to habitats and species wherever possible. A planning condition may be applied to secure mitigation in line with an Environmental Statement.

b) Scottish Natural Heritage can provide guidance on treatment of protected species. Some operations may require a licence.

c) Ensure works are carried out at the appropriate time of year to avoid disturbance to species. Any disturbance may be in contravention of European law or National law.

3.1 Development Design considerations to incorporate Biodiversity Objectives

4. ENHANCE – EXISTING HABITATS AND CREATE NEW ONES

a) In accordance with PAN 60, Argyll and Bute Council have a statutory duty to be proactive in securing protection and enhancement of our local biodiversity.
b) The extent of any habitat enhancement or creation will depend on the size of the development and its location. Habitat creation must fit with the landscape character of the area but additional consultation with Scottish Natural Heritage and other conservation organisations is advised.

5. COMPENSATE – WHERE DAMAGE IS UNAVOIDABLE

a) The developer can enter into a planning agreement to re-create or manage habitat on or off-site.

6. MONITORING AND MANAGEMENT

a) Provision must be made for appropriate management of retained features and of new or enhanced habitat.
b) The developer should monitor the site, particularly the establishment of new or enhanced habitats and to ascertain any effects on wildlife during or after works.
c) The developer should be responsible for management, at least for the first five years. Options for long term management include an agreement with a local community group or organisation. The developer may wish to offer a commuted sum for the management through a planning obligation.
d) Planning conditions may be used to secure the preparation and implementation of a management plan with the agreed management plan objectives.

3.1.2 Management during construction and aftercare

The management of the site during construction should follow appropriate guidelines for protection of species and habitats including trees and features to be retained on site forming part of the overall landscape plan with integrated biodiversity elements. A management plan for the maintenance of the site post-construction should include a biodiversity action plan. This plan will ensure that what is agreed at the planning stage is managed appropriately through surveying and monitoring methods to assess progress. This can be built into the overall maintenance plan as part of the contract. Developers should note that the larger the site, the more important the Biodiversity Action Plan is.

4.0 Appendices

4.1 Biodiversity Field Checklists:

- Sheet 1 – Site Biodiversity Checklist – initial observations
- Sheet 2 – Site Biodiversity Checklist – Report
- Sheet 3 – Checklist for Invasive Non-Native Species (INNS) Control and Management
- Sheet 4 – Ecological Survey Calendar
- Sheet 5 – Ecological Mitigation Calendar

4.2 Buildings and Biodiversity

4.3 Development Proposals

4.4 Biodiversity Habitat Enhancement and Creation - Opportunities

4.5 European Protected Species and Protected Species

4.6 National Legislation

4.7 Habitat and Species Priorities for Argyll and Bute

4.8 Plant Selection Suggestions

4.9 Green Roofs and Green Walls

4.10 Boundaries including Hedgerows

Site location: | OS Ref:

Site Ref No: | Date:

Habitat Interest

	Present Yes/No	Size / Area / Survey √	Wildlife Corridor
Survey Designated Site	○		○
Trees	○		○
Tree Line	○		○
Woodland or Orchard	○		○
Hedges	○		○
Farmland	○		○
Grassland	○		○
Scrub	○		○
Water courses	○		○
Ponds/Standing water	○		○
Rough Grassland/moorland	○		
Peatlands - Bogs/Wetland	○		
Walls or Stone	○		○
Dykes Building	○		○
New Build	○		○
Coastal and Marine	○		

Wildlife Interest and Invasive Non-Native Species- circle appropriate species ◯

	Yes/No		LBAP Species	Survey
Breeding Birds	○	○	○	○
Mammals/General	○	○	○	○
Otters (EPS), Water Vole, Badger, Red and/or Grey (INNS) Squirrels, Bats (EPS)	○	○	○	○
Amphibians and Reptiles Inc. Great Crested Newt (EPS)	○	○	○	○
Trees	○	○	○	○
Plants	○	○	○	○
Lichens and mosses	○	○	○	○
Invasive Non-Native Species- (INNS) Japanese Knotweed etc. ***see Sheet 3.***	○	○		○
Other				
please specify	e.g			

External influence of Development

On water courses
Increased public pressure on designated sites
Wildlife corridors
Habitat isolation or fragmentation
Other

Measures recommended: **See Biodiversity Supplementary Guidance for European Protected Species (EPS) and Protected Species (PS)**

Monitoring agreed with the following agencies – see below:

Checklist – Organisations Contacted:

- SNH – state which office
- SEPA – state which office
- FCS – state which office
- RSPB – state which office
- SWT – state which office

Property Reference:	Full Address:	Forms completed by:

Grid ref:	Designated Sites- *please circle the relevant type and in or adjacent (i/a)*									
	Type:	SSSI	LNCS	SAC	MCA	MPA	SPA	LNR	NNR	G&DL
	In or adjacent= i or a	i/ a	i/ a	i/ a	i/ a	I/ a	i/a	i/a	i/a	i/a
	other:									

Notes:

Habitat-dominant	Adjacent habitats- i.e. rivers, lochs, peatlands etc

Species in Building/ Structure: Note evidence	Location with Building/Structure eg Walls, Underground sites, Roofs, Interior, Ponds/Water Features:	Recorded by:	Date:

Recommendations for of each Habitat and Species:

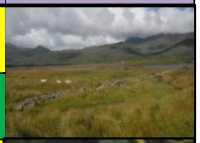
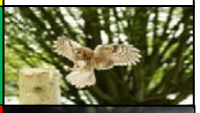
Species: note evidence, prints, spraint, droppings…	Seasonal Constraints: optimum time	Organisations Contacted: See: Biodiversity Technical Note	Action to be Undertaken, Date & Initials: See Supporting Notes Ecological Survey √ box

1. Site Map required	Identify Areas for Action: Locate on site map and name eg. Area 1, Area 2 etc and attach map
2. Identify Landowner (if applicable)	Set up a meeting to discuss and agree the management of the INNS.
3. Prioritise in terms of benefits	Rate 1-10 i. Habitat ii. sight line iii. Properties iv. Neighbours
4. Liaise with the Local Authority and relevant agencies- i.e. SNH, SEPA or Marine Scotland. Yes/ No	Gather Information on habitat by using Biodiversity Check Lists Sheet 1 and 2

5. Draw up programme of work over a three year period and cost (include equipment, materials, professional and volunteer effort etc) See example Year 1.

Date 00/00/0000	Area according to site map- Area 1.	INNS species type	Control measure- type of chemical/ application rate	Cost / application	Photographs	Observation date; year 2 onwards and % rate of success
Year 1	Area 1, 2, and 3…	Japanese Knotweed	Eg. Glyphosate; Rate: amount/m2	£/ App.	yes	00/00/0000; 80% success
Year 2						
Year 3						

http://www.invasivespeciesscotland.org.uk/

Target	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Illustration
Habitat and Vegetation	Phase 1 only			Phase 1 and NVC Detailed Habitat assessment surveys					Phase 1 only (least suitable time) No other detailed surveys				
	Moses and Lichens No Other detailed surveys			Mosses and Lichens		No surveys for Mosses and Lichens			Mosses and Lichens				
Badgers	Limited Sett/ bait surveys	Bait marking and sett surveys			Limited bait marking and sett surveys				Sett surveys			Limited sett/bait surveys	
Bats	Inspection of Hibernation Roosts (quite difficult)			Limited Activity	Summer roost emergence surveys and activity surveys (internal inspection of roof spaces possibly throughout April to October					Limited Activity	Inspection of Hibernation Roosts (quite difficult)		
Birds	Winter species	Breeding Birds/migrant species		Breeding birds			Low activity		Migrant species		Winter species		
Great crested Newts	Newts Hibernating		Pond surveys for adults/terrestrial survey. Egg Surveys April-Mid June, Larvae surveys from Mid- May						Habitat survey		Newts hibernating		
Reptiles	Reptiles hibernating		Pond survey months are April and May			Reduced basking time lowers effectiveness of refugia surveys			Peak survey month	Limited activity	Reptile hibernating		
Red Squirrel	Optimum Time		Breeding Den surveys			Optimum Time			Surveys possible weather permitting				
Otters	Limited vegetation cover rather than seasons												
Water Voles	Avoid works in habitat	Initial Habitat survey	Habitat and field signs/activity surveys maybe limited vegetation cover and weather								Initial Habitat survey	Low activity	
Fish	For coastal, river and stream dwelling species, the timing of surveys will depend on the migration pattern of the species concerned. Where information on breeding is required, the survey will need to coincide with the breeding period which may be during the summer or winter months depending on the species.												
Key	Recommended period of Survey			Sub-optimal period of survey					Surveys not possible				

Target	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Habitat and Vegetation	Planting and translocation			No mitigation for most species						Planting and translocation		
Badgers	Construction of artificial setts only (no disturbance of existing setts)							Exclusion from setts and destruction				Artificial sett construction only as per Jan- July
Bats	Maternity Roost works until Mid-May				No Maternity Roosts works				Maternity roost works from Mid- September			
	Hibernation Period		Hibernation roost works from mid -March									
Birds	Clearance work		Nesting season (avoid all clearance works without a breeding bird survey)								Clearance work	
Great crested Newts	Pond Management only		Both terrestrial and aquatic trapping possible					Terrestrial trapping only			Pond Management only	
Reptiles	Scrub Clearance		Capture and translocation programmes and scrub clearance				Weather dependant but likely to be sub-optimal due to temperatures		Capture and trans-location	Scrub clearance		
Red Squirrel	Avoid all works in Red Squirrel habitat									Optimum time for works		Avoid all works in Red Squirrel habitat
Otters	No seasonal constraints however restrictions are likely during breeding seasons											
Water Voles	Avoid works in habitat		Trapping and exclusion		Avoid works (breeding season)					Trapping and exclusion	Avoid works in habitat	
Fish	Mitigation for the protection of water courses is required at all times of the year. Mitigation for particular species will need to be timed so as to avoid their breeding season, this varies between species.											
Key	Recommended period of Survey				Sub-optimal period of survey					Surveys not possible		

4.2 Buildings and Biodiversity

The following is applicable to repair and maintenance as well as new builds.

Buildings should not be viewed in isolation but rather as an element of the environment.

Introduction	**Buildings should not be viewed in isolation but as part of the landscape in terms of association with boundaries, landscape and water. When managed in such a way as to benefit biodiversity, they will have wider positive implications for the local community:** • The repair of buildings is considered beneficial to Wildlife. • The use of traditional as well as softer materials is more attractive to wildlife.
Planning Stage	**Consider Biodiversity implications at the outset:** • What biodiversity exists on the site? • Are they rare or protected by law? • Are there any designations on or near the site? • How can the habitats and species be incorporated into the site design? • Are there timing constraints to be considered i.e. nesting. • How can biodiversity interest be increased? • How detailed does the survey need to be? • What further information does the developer need and from who? e.g. SNH
Contract Stage	**Ensure that biodiversity constraints and objectives are known at the outset:** • Are all parties involved with the development aware of them and have access • Aware of the reason for this approach being taken and its importance and why these biodiversity objectives are important to the development.
Development Completion	**Future management:** • Has biodiversity been built into future management plans • Where has the information from the biodiversity process associated with the development been recorded and if appropriate made available for consultation • What type of surveying and monitoring system has been put in place for rescoring actions? • How can the knowledge of the site be relayed to the public? • Can the local Community be enlisted to take the process of ensuring that biodiversity duty is maintained.

4.3 Development Proposals

Housing Developments	Discussions	Survey	Recommendations
Includes other Development	Applicant and planner liaise to ensure that Biodiversity concerns are raised at the beginning of the process.	Timetabled appropriately Sch. 1 and some Sch. 2 development will require an EIA – T&CP EIA Regs 1999 (see Table 1)	Habitat creation should correspond with the landscape character assessment.
	Habitat enhancement will depend on the size of the development and location.		Additional information on designations can be acquired from Scottish Natural Heritage.
	A&BC are proactive in encouraging habitat creation, in line with the LBAP.		From Greenspace Scotland and the Scottish Golf Environment Foundation.
	New settlements or urban extension early discussion with planners with various options.		Landscape design and planting to be included as part of the Full Planning Permission or alternatively as a condition.
	Landscaping for sports, recreation, car parking should follow recommendations as in 1, 2, 3, 4.		
Major Developments Summary – key elements	Protection for existing habitats and species; Mitigation – against potentially adverse effects; Enhancement – existing habitats and create new ones; Compensation – where damage is unavoidable but must be carried out under license from SNH; Monitoring and Management during and post construction.	Baseline information essential – see note on European Protected Species.	Each development is individual offering the developer the opportunity to be innovative in design and to enable them to assist in protecting and enhancing biodiversity.

Quarries	Applicant and Planner liaise to ensure that biodiversity is considered at the outset of any new workings. Large scale habitat creation is encouraged for old workings provided they have clear biodiversity objectives.	Timetabled appropriately
	Cessation of workings will have conditions for re-instatement for agricultural or landscape or biodiversity habitat creation. The Environment Act 1995 supports the restoration of quarries for biodiversity. A review of the original conditions can impose nature conservation use. Detailed landscape design and planting plans for screening should be submitted with the full planning permission. Aftercare management and monitoring to form part of the planning consent.	
Landfill and Recycling Sites	Applicant and Planners liaise to ensure that biodiversity is considered at the outset of any new workings. Screening of workings. Cessation of workings will have conditions for re-instatement for agricultural or landscape or biodiversity habitat creation. Surface drainage ditches should be conserved and protected against pollution.	Many landfill sites are re-seeded as rough grassland – which will be suitable for a number of bird and plant species in the LBAP. Capping needs careful management consideration as trees will interfere with the seal. New ditches can be created with additional grassy and thicket riparian edges.

Road and Rail	Applicant and Planner liaise to ensure that biodiversity is considered at the outset of any new working. Mitigation for wildlife. Maintenance of verges.	Timetabled appropriately.	Warning signs for wildlife and briefing information for rail drivers is important where priority LBAP species i.e. Red Squirrel, Otter, Badger, Toad. Tunnels, rope bridges, underpasses and slipways may be used where evidence of these species exist. Maintain an appropriate grass cutting and Invasive Non-Native Species control regime, planting should only be considered where it will not compromise safety for both user and wildlife.

4.4 Biodiversity Habitat Enhancement and Creation - Opportunities

4.4.1 Landscaping – Key principles

- Recognise that habitat creation and planting are not acceptable substitutes for protecting existing sites of high wildlife value.
- Consider the potential for natural regeneration – in some cases planting will be necessary to mitigate what may be perceived as unkempt.
- Design your project well so that it can contribute to objectives laid down in the Argyll and Bute Local Biodiversity Action Plan.
- Plan ahead to allow contractors sufficient time to obtain plants and prepare the site.

4.4.2 **Landscape design plans should** (where possible and appropriate):

- Incorporate existing habitats and features into 'green spaces'.
- Retain mature and veteran trees for their high biodiversity value – these will need to be monitored annually for safety.
- Use 'public space' to demonstrate biodiversity benefits by using local provenance native species for wildflower meadows, woodlands, shrub borders and creating ponds, woodpiles, ponds etc. Access should be limited to one side of the habitat so not to disturb wildlife.
- Complement, rather than distract from, the localities natural countryside character and distinctiveness.
- Promote 'Gardening for Wildlife' by using a Show Home Garden – choose plants that produce to encourage bees and butterflies; berries to encourage birds and different types of bark to encourage a wide variety of insects – Appendix 1 – full native species list.
- Manage grass areas by using a variety of mowing regimes – ornamental to rough grass.
- Build in chemical free maintenance by using mulch and groundcover planting.

See **Appendix 4.8** for suitable plants for biodiversity.

4.4.3 Drainage and Water Management

- Carry out a feasibility study for the suitability of sustainable urban drainage systems (SUDS) by including reed-beds, willow filtration systems and balancing ponds – See Drainage Assessment – A Guide for Scotland, SEPA.
- Where there are natural burns or rivers in the development or adjacent, consider the needs of *water voles, *otters and kingfishers (sand martens may exist where the bank is sandy) – retain riparian woodland / thickets / grassland to ensure that the wildlife has cover.
- If newts are to be encouraged, a sizeable amount of grass and (if possible) woodland up to 500m around the pond.
- Along ditch edges maintain a wildlife corridor.

4.4.4 Additional Biodiversity Features

- Encourage a range of boxes suitable for birds (owl, swallow, swift, house marten) and *bats. These can be placed on trees and around the house.
- Green roofs – see **Appendix 4.9** for details, dry stone dykes as excellent nesting places for birds and a welcome habitat for invertebrates.
- Encourage wildlife-friendly climbing plants on houses and boundary fences.
- Habitat creation – for inspiration consult the Argyll and Bute Local Biodiversity Action Plan.
- Argyll and Bute Local Biodiversity Action Plan species.

4.5 European Protected Species and Protected Species

4.5.1 Policy

Policy legislation	Objective	Key provisions
The Ramsar Convention 1971 (The Convention on Wetlands of International Importance Especially as Waterfowl Habitat)	To provide a framework for international co-operation for the conservation and wise use of wetlands and their resources.	• Designation of wetlands of international importance as Ramsar sites, • Inclusion of wetland conservation in national land use planning
The Birds Directive 1979 (EC Council Directive on the Conservation of Wild Birds 79/409/EEC)	'…The conservation of all species of naturally occurring birds in the wild state in the European territory of the Member States'.	• A general level of protection for all wild birds in the territory of the EC, • Designation of Special Protection Areas (SPA's) to conserve the habitat of certain particularly rare species and of migratory species listed in Annex 1.
The Habitats Directive 1992 (EC Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora 92/43/EEC)	'… to contribute towards ensuring biodiversity through the conservation of natural habitats and of wild flora and fauna in the EC (Article 2 (1))'.	• Establishment of Special Areas of Conservation (SAC) to maintain at (or restore to) 'favourable conservation status' (FCS) the habitats and species of community importance listed in Annexes 1 and 11. Certain identified as priority FCS is defined as 'when the species population and range is stable (or increasing) and there is a sufficiently large area of habitat available to maintain its population on a long-term basis' (Article 1 (J)), • Protection of species outside SAC's.
Natura 2000	To establish a network of protected areas as a coherent European ecological network (Article 3 (1) Habitats Directive). Together SPA's and SAC's will make up Natura 2000.	• Management plans where appropriate (Article 6 (4) Habitats Directive), • An environmental assessment of all non-management projects which may have a significant effect on Natura 2000 sites to evaluate whether it will affect FCS of the relevant habitat / species (Article 6 (3) Habitats Directive). If there will be a negative ecological impact the project may only proceed if certain conditions are satisfied. • Where a project does go ahead compensatory measures must be taken to ensure that the overall coherence of Natura 2000 is protected (Article 6 (4)).

4.5 European Protected Species and Protected Species

4.5.2 List of European Protected Species

European Protected Species	Distribution
Dolphins, Porpoises and Whales	Porpoises, dolphins and whales have been sighted around the islands of Mull, Coll, Tiree, Lismore, Islay, Jura and Gigha. Seasonal passage of Minke whales in all offshore waters and areas of summer residence. Information can be acquired from SNH and the Hebridean Whale and Dolphin Trust.
All Bat Species	Pipistrelle, Brown Long-eared and Daubenton's and Natterer's bats have been found in Argyll and Bute. Roosts occur in houses, old trees, bridges and rock crevices – especially in wooded areas or near watercourses / waterbodies. Limited distribution information from SNH or the local bat group.
Otter	Found in nearly all watercourses in Argyll and Bute, otters are also widespread in coastal areas.
Wildcat	This species could occur across most of Argyll away from population centres, particularly in areas of mixed farmland, woodland and heath. Hard evidence of their presence is scarce and difficult to establish. Most recent distribution national survey completed in 2010.
Great Crested Newt	Found in ponds and wetlands in lowland areas. They also need to be considered in proposed development affecting land adjacent to these ponds.
Vertebrates – Marine Turtles – Leathery Turtle	This species is an uncommon summer visitor to our waters. Sightings of them have increased in the last decade particularly in Loch Fyne, Loch Melfort, Sound of Jura and off East Kintyre.
Killarney Fern	Found in Atlantic woodlands which are a Biodiversity Action Plan habitat.
Slender Naiad	Found in Loch a'chlair (3.1ha, Olig, Tiree), Loch Gorm (271ha, Meso, Islay), Loch nan Gad (9.7ha, Mesotrophic Loch, Kennacraig).
Floating-leaved Water-plantain	There is a debate as to whether this species in Scotland is an EPS found in one sample, 10km^2 at the head of Loch Etive.
Plants – Yellow Marsh Saxifrage	Eilean na Muice Duibhe (Islay), Glac na Criche and Feur Lochain. For a full list of offences see SNH's Protected Species A-Z

4.5 European Protected Species and Protected Species

4.5.3 Offences

In terms of any development of a site, it is illegal to destroy or damage a breeding site or resting place of a European Protected Species. In respect of the strict liability, the animal does not have to be presently using such a breeding site or resting place for an offence to be committed. Being a 'strict liability' or absolute offence this means ignorance and lack of any intention to damage the breeding site / resting place is no defence in law and will subsequently lead to prosecution.

Under this legislation the following are offences if undertaken deliberately or recklessly:

- To capture , injure or kill a wild animal which is a European Protected Species (EPS);
- To capture or harass a wild animal or a group of wild animals of EPS;
- To disturb such an animal while it is occupying a structure or place it uses for shelter or protection;
- To disturb such an animal while it is rearing or otherwise caring for its young;
- To obstruct access to a breeding site or resting place, or otherwise denying the animal the use of a breeding site or resting place;
- To disturb such an animal in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of the species to which it belongs;
- To disturb such an animal in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young;
- To deliberately or recklessly disturb such an animal while it is migrating or hibernating;
- To disturb any dolphin, porpoise or whale (cetacean);
- To pick, collect, cut, uproot or destroy a wild plant of EPS.

4.5.4 Important additional information on Protected Species

Species protected under the Wildlife and Countryside Act (1981) as amended.

Species	Distribution
All breeding bird species	Widespread
Pine Marten	Very widespread
Red Squirrel	Found on the Mainland only
Water Vole	Localised
Slow Worm	Widespread
Adder	Widespread
Allis Shad	Localised
Badger	Localised
Twaite Shad	Localised
Freshwater Pearl Mussel	Known sites – restricted information

4.5 European Protected Species and Protected Species

Fan Mussel	Found in 4 marine 10km^2 on the West Coast. Contact (mollusc) SNH for more information.
Bluebell	Very widespread
Slender Naiad	Localised
Floating Water-plantain	In one, 10km^2 at the head of Loch Etive
Marsh Saxifrage	Unknown
Green Shield Moss	Localised
Petalwort	Unknown

http://www.snh.gov.uk/protecting-scotlands-nature/protected-species/
http://www.snh.gov.uk/planning-and-development/advice-for-plannersanddevelopers/protected-animals/
http://www.snh.gov.uk/protecting-scotlands-nature/species-licensing/

4.6 National Legislation

Policy legislation	Objective	Key provisions
The National Parks and Access to the Countryside Act 1949	Introduced the concept of designation of sites of nature conservation importance.	• Designation of National Nature Reserves (NNR's), • Introduced designation of SSSI's (see below), • Conferred powers on local authorities to create Local Nature Reserves (LNR's)
Wildlife and Countryside Act 1981 (as subsequently amended)	Introduced to address the problem of species protection and habitat loss. The main piece of UK wildlife legislation implements provision of the Birds and Habitats Directives in the UK.	• Notification of Sites of Special Scientific Interest (SSSI's) given certain protection against damaging operations, • Protection of species outside SSSI's, • Established Areas of Special Protection for Birds (AOSP's)
WCA (1981) Species listed on Schedules 1 Birds, 5 Animals, 7 Protection of certain animals, 8 Plants, 9 Animals and plants to which S.14 applies of the Wildlife and Countryside Act 1981 (and as amended by the Nature Conservation (Scotland) Act 2004)	As above and to strengthen the 1981 Act.	Application and offences Even though there have been significant revisions to the 1981 Act, it remains a very important statute relating to wildlife protection in Scotland. The Act applies to the terrestrial environment and inshore waters (0-12 nautical miles).
Nature Conservation (Scotland) Action 2004	Under Section 1 (1) of the Nature Conservation (Scotland) Action 2004: 'It is a duty of every public body and office-holder, in exercising any functions, to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions'.	Local Government duty This legislation gives the public sector in Scotland a unique leadership role in recognising its impact and dependence on biodiversity, and working to protect our biological inheritance. This duty applies to public bodies' activities and operations, and to their plans and policies.
Wildlife and Natural Environment (Scotland) Act 2011	This new act modernises legislation on the management of wildlife and improves legislative provision for invasive non-native species where they become established and cause adverse ecological, environmental or economic impacts.	1.2 For certain (non-bird) protected species1, the Wildlife and Natural Environment (Scotland) Act 2011 (WANE Act) has added a new licensing purpose to the WCA at section 16(3)(i)): 'for any other social, economic or environmental purpose'. A Code of Practice on Non-Native Species supports this Act. Licences can only be issued for specific

		purposes defined in the Act. Please refer to Annex 1 for further information on this matter. http://www.snh.gov.uk/docs/B896429.pdf
Protection of Badgers Act 1992	To consolidate the following pervious Acts: • Badgers Act 1973, • Badgers Act 1991 and • Badgers (Further Protection) Act 1991 The protection of Badgers Act 1992 relates to certain sections of other relevant acts such as The Wildlife and Countryside Act 1981 and as amended by the Nature Conservation (Scotland) Act 2004 .	**The Act protects badgers and their setts, and is laid out in three sections:** Offences 1. Taking, injuring or killing badgers. 2. Cruelty. 3. Interfering with badger setts. 4. Selling and possession of live badgers. 5. Marking and ringing. ~~Exceptions and Licenses~~ 1. 1. Taking or attempting to take a badger which has 2. been disabled otherwise than by his act and is taken or to be taken solely for the purpose of tending it; 3. Killing or attempting to kill a badger which appears to be so seriously injured or in such a condition that to kill it would be an act of mercy; 4. Unavoidably killing or injuring a badger as an incidental result of a lawful action; 5. Doing anything which is authorised under the M1Animals (Scientific Procedures) Act 1986. Enforcement and Penalties 1. Powers of constables. 2. Penalties and forfeiture. 3. Powers of court where dog used or present at commission of offence. 4. Interpretation. 5. Short title, repeals, commencement and extent. Further information on Licensing: http://www.snh.gov.uk/protecting-scotlands-nature/protected-species/which-and-how/mammals/badger-protection/

4.7 Habitat and Species Priorities for Argyll and Bute

List extracted from the Argyll and Bute Local Biodiversity Action Plan 2010-15

4.7.1 Lowland and Farmland Ecosystem

Habitat	Classification	Species	
		Common Name	Scientific Name
Lowland meadows	Plant (lower)	Lichen	*Cladonia peziziformis*
	Bird	Lapwing	Vanellus vanellus
Upland hay meadows	Plant	Irish lady's-tresses	*Spiranthes romanzoffian*
	Bird	Common cuckoo	*Cuculus canorus*
Lowland calcareous grassland	Insect	Great yellow bumblebee	*Bombus distinguendus*
	Bird	Skylark	*Alauda arvensis*
Lowland dry acid grassland	Moth	Forester	*Adscita statices*
	Bird	Twite	*Carduelis flavirostris*
Lowland heathland	Moth	Narrow-bordered bee hawk-moth	*Hemaris tityus*
	Mammal	Soprano pipistrelle bat	*Pipistrellus pygmaeus*
Purple moor grass and rush pastures	Moth	Dover Twist	*Periclepsis cinctana*
	Bird	Barnacle goose	*Branta leucopsis*
Waxcap grassland	Moth	Transparent burnet moth	*Zygaena purpuralis caledonensis*
	Bird	Greenland white-fronted goose	*Anser albifrons*
	Moth	Argent & sable	*Rheumaptera hastate*
	Bird	Corncrake	*Crex crex*
	Moth	Slender scotch burnet moth	*Zygaena loti scotica*
	Bird	Golden plover	*Pluvialis apricaria*
	Butterfly	Marsh fritillary	*Euphydryas aurinia*
	Bird	Redshank	*Tringa totanus*
	Butterfly	Chequered skipper	*Carterocephalus palaemon*
	Bird	Tree sparrow	*Passer montanus*
	Reptile	Adder	*Vipera berus*
	Mammal	Brown long-eared bat	*Plecotus auritus*
	Mammal	Daubenton's bat	*Myotis daubentonii*
	Mammal	Noctule bat	*Nyctalus noctula*

4.7.2 Upland Ecosystem

Habitat	Classification	Species	
		Common Name	Scientific Name
Upland calcareous grassland	Algae	Jelly Lichen	*Collema fragile*
	Butterfly	Marsh fritillary	*Euphydryas aurinia*
Upland heathland	Plant (lower)	Lichenised genus of fungi	*Poeltinula cerebrina*
	Insect (dragonfly)	White-faced darter	*Leucorrhinia dubia*

4.7 Habitat and Species Priorities for Argyll and Bute

Habitat	Classification	Species	
		Common Name	Scientific Name
Inland rock outcrop and scree habitats	Plant	Juniper	*Juniper communis*
	Insect (dragonfly)	Brilliant emerald	*Somatochlora metallica*
Blanket bog	Plant	Alpine woodsia	*Woodisa alpinamontana*
	Insect (dragonfly)	Azure hawker	*Aeshna caerulea*
Upland flushes, fens and swamps	Plant	Arctic sandwort	*Arenaria norvegica norvegica*
	Mollusc	Geyer's whorl snail	*Vertigo geyeri*
	Plant (lower)	Cyphel - moss	*Minuartia sedoides*
	Bird	Black grouse	*Tetrao tetrix*
	Plant	Downy willow	*Salix lapponum*
	Bird	Black-throated diver	*Gavia arctica*
	Plant	Alpine bartsia	*Bartsia alpina*
	Bird	Red-throated diver	*Gavia stellata*
	Plant (lower)	Wrinkle-leaved feather moss	*Rhytidium rugosum*
	Bird	Peregrine	*Falco peregrinus*
	Insect	Moss carder bee	*Bombus muscorum*
	Bird	Hen harrier	*Circus cyaneus*
	Moth	Narrow-bordered bee hawk-moth	*Hemaris tityus*
	Bird	Arctic skua	*Numenius arquata*
	Moth	Forester	*Adscita statices*
	Moth	Argent and sable	*Rheumaptera hastate*
	Bird	Ring ouzel	*Turdus torquatus*
	Butterfly	Pearl bordered fritillary	*Boloria euphrosyne*
	Bird	Golden eagle	*Aquila chrysaetos*
	Mammal	Red deer	*Cervus elaphus*
	Bird	Merlin	*Falco columbarius*
	Bird	Cuckoo	*Cuculus canorus*
	Bird	Short-eared owl	*Asio flammeus*
	Bird	Twite	*Carduelis flavirostris*

4.7.3 Woodland Ecosystem

Habitat	Classification	Species	
		Common Name	Scientific Name
Upland oak woodland	Plant (lower)	Lichen	*Arthonia cohabitans*
	Reptile	Adder	*Vipera berus*
Upland mixed ash woods	Plant (lower)	Lichen	*Arthonia thelotrematis*
	Bird	Black grouse	*Tetrao tetrix*
Wet woodlands	Fungi	Hazel gloves	*Hypocreopsis rhododendri*
	Bird	Common cuckoo	*Cuculus canorus*

4.7 Habitat and Species Priorities for Argyll and Bute

Habitat	Classification	Species	
		Common Name	Scientific Name
Lowland mixed deciduous woodlands	Fungi	Gilded brittlegill	*Russula aurea*
	Bird	Wood warbler	*Phylloscopus sibilatrix*
Wood-pasture and parkland	Plant (lower)	Lichen	*Opegrapha brevis*
	Bird	Nightjar	*Caprimulgus europaeus*
Native pinewood	Plant (lower)	Lichen	*Opegrapha pulvinata*
	Bird	Spotted flycatcher	*Muscicapa striata*
	Plant (lower)	Lichen	*Arthonia atlantica*
	Mammal	Red squirrel	*Sciurus vulgaris*
	Plant (lower)	Lichen	*Graphis alboscripta*
	Mammal	*Wildcat	*Felix sylvestris grampia*
	Plant (lower)	Lichen	*Lecanora cinereofusca*
	Mammal	*Soprano pipistrelle bat	*Pipistrellus pygmaeus*
	Plant (lower)	Lichen	*Pyrenula hibernica*
	Mammal	*Brown long-eared bat	*Plecotus auritus*
	Plant (lower)	Lichen	*Cladonia norvegica*
	Mammal	*Daubenton's bat	*Myotis daubentonii*
	Plant	Juniper	*Juniperus communis*
	Mammal	*Noctule bat	*Nyctalus noctula*
	Insect	Southern yellow splinter	*Lipsothrix nervosa*
	Bird	Pied flycatcher	*Ficedula hypoleuca*
	Plant	Mountain bladder-fern	*Cystopteris montana*
	Bird	Redstart	*Phoenicurus phoenicurus*
	Moth	Narrow-bordered bee hawkmoth	*Hemaris tityus*
	Butterfly	Pearl-bordered fritillary	*Boloria euphrosyne*
	Moth	Argent and Sable	*Rheumaptera hastate*
	Butterfly	Chequered skipper	*Carterocephalus palaemon*

4.7.4 Built Environment Ecosystem

Habitat	Classification	Species	
		Common Name	Scientific Name
Built and developed environment	Bird	Song thrush	*Turdus philomelos*
Greenspace	Bird	Spotted flycatcher	*Muscicapa striata*
Wildlife corridors	Mammal	*Soprano pipistrelle bat	*Pipistrellus pygmaeus*
Wood-pasture and parkland	Bird	Swift	*Apus apus*
Lowland meadows	Mammal	Red squirrel	*Sciurus vulgaris*
	Insect	Bumblebee	*Bombus species*

4.7 Habitat and Species Priorities for Argyll and Bute

4.7.5 Freshwater Ecosystem

Habitat	Classification	Species	
		Common Name	Scientific Name
Reedbeds	Plant (lower)	Marsh clubmoss	*Lycopodiella inundata*
	Bird (duck)	Common scoter	*Melanitta nigra*
Lowland raised bog	Plant	Irish lady's-tresses	*Spiranthes romanzoffiana*
	Bird	Black-throated diver	*Gavia arctica*
Eutophic standing waters	Plant (lower)	Club sedge	*Carex buxbaumii*
	Bird	Red-throated diver	*Gavia stellata*
Rivers	Plant	False sedge - grass	*Kobresia simpliciuscula*
	Mammal	Water vole	*Arvicola terrestris*
Mesotrophic lakes	Insect	Southern yellow splinter	*Lipsothrix nervosa*
	Mammal	*Otter	*Lutra lutra*
Oligotrophic and dystrophic lakes	Shellfish (fresh water)	Freshwater pearl mussel	*Margaritifera margaritifera*
	Mammal	*Soprano pipistrelle bat	*Pipistrellus pygmaeus*
Lowland fens	Arachnid	Welch's money spider	*Erigone welchi*
	Mammal	*Daubenton's bat	*Myotis daubentonii*
	Fish	Atlantic salmon	*Salmo salar*
	Mammal	*Noctule bat	*Nyctalus noctula*
	Fish	Sea lamprey	*Petromyzon marinus*
	Bird	Osprey	*Pandion haliatetus*
	Fish	River lamprey	*Lampetra fluviatilis*
	Bird	Dunlin	*Calidris alpina*
	Bird	Greenland white-fronted goose	*Anser albifrons*

6.3.6 Marine and Coastal Ecosystem

Habitat	Classification	Species	
		Common Name	Scientific Name
Sub-tidal sands and gravels	Plant (lower)	Lichen	*Arthonia atlantica*
	Mammal	Minke whale	*Balenoptera acutorostrata*
Seagrass beds	Plant (lower)	Lichen	*Cladonia peziziformis*
	Mammal	*Common dolphin	*Delphinus delphis*
Coastal sand dunes	Insect	Northern Colletes - Bees	*Collema fragile*
	Mammal	*White beaked dolphin	*Lagenorhynchus albirostris*
Coastal vegetated shingle	Plant (lower)	Lichen	*Arthothelium norvegicum*
	Mammal	*Bottlenose dolphin	*Tursiops truncatus*
Machair	Plant (lower)	Lichen	*Cladonia stereoclada*
	Mammal	Harbour seal	*Phoca vitulina*
Maerl beds	Algae	Wig wrack or sea-loch egg wrack	*Ascophyllum nodosum ecad mackaii*
	Mammal	Grey seal	*Halichoerus grypus*

4.7 Habitat and Species Priorities for Argyll and Bute

Habitat	Classification	Species	
		Common Name	Scientific Name
Maritime cliffs and slopes	Plant	Purple milk-vetch	*Astragalus danicus*
	Bird	Greenland white-fronted goose	*Anser albifrons*
Mud habitats in deep water	Plant	Juniper	*Juniperus communis*
	Bird	Barnacle goose	*Branta leucopsis*
Serpulid reefs	Plant	Dune gentian	*Gentianella uliginosa*
	Bird (duck)	Common scoter	*Melanitta nigra*
Blue mussel beds	Plant	Pugsley - eyebright	*Euphrasia heslop-harrisonii*
	Bird	Black-throated diver	*Gavia arctica*
Tide-swept channels	Moth	Forester	*Adscita statices*
	Bird	White-tailed eagle	*Haliaeetus albicilla*
File shell beds	Insect	Great yellow bumblebee	*Bombus distinguendus*
	Bird	Corncrake	*Crex crex*
	Insect	Moss carder bee	*Bombus muscorum*
	Bird	Arctic skua	*Stercorarius parasiticus*
	Insect	Red-shanked carder bee	*Bombus ruderarius*
	Bird	Herring gull	*Larus argentatus*
	Insect	Northern colletes	*Colletes floralis*
	Bird	Little tern	*Sternula albifrons*
	Moth	Slender scotch burnet moth	*Zygaena loti scotica*
	Bird	Common tern	*Sterna hirundo*
	Animal	Timid burrowing anemone	*Edwardsia timida*
	Bird	Arctic tern	*Sterna paradisaea*
	Shellfish	Native oyster	*Ostrea edulis*
	Bird	Chough	*Pyrrhocorax pyrrhocorax*
	Shellfish	Fan mussel	*Atrina fragilis*
	Mammal	*Otter	*Lutra lutra*
	Arachnid	Bend-bearing blunt-brow spider	*Silometopus incurvatus*
	Bird	Peregrine	*Falco peregrinus*
	Fish	Atlantic salmon	*Salmo salar*
	Bird	Redshank	*Tringa totanus*
	Fish	Sea lamprey	*Petromyzon marinus*
	Bird	Common tern	*Sterna hirundo*
	Fish	River lamprey	*Lampetra fluviatilis*
	Fish	*Basking shark	*Cetorhinus maximus*
	Mammal	*Harbour porpoise	*Phocoena phocoena*

4.8 Plant Selection Suggestions

Shrubs: Ornamental

Plant Name	Biodiversity Interest
Cotoneaster 'Coral Beauty'	Insects / birds
Ilex aquafolium	Insects / birds
Hebe 'Mrs Winder'	Insects / birds
Rosemarinus officinalis	Insects
Filipendula	Insects
Geranium pratense	Insects
Ajuga repens	Insects
Rosa canina	Insects / birds
Rosa rubrifolia	Insects / birds
Berberis x stenophylla	Insects
Lonicera periclymen	Insects / birds
Sedum spectabile	Insects / butterflies

Trees: Native

Tree Name	Biodiversity Interest
Sorbus aucuparia	Birds / shelter
Sorbus 'Joseph Rock' (ornamental)	Birds / shelter
Crataegus monogyna	Birds / shelter
Salix carprea	Insects / shelter / damp areas
Pinus sylvestris	Birds / shelter
Quercus robur	Birds / insects / shelter
Prunus avion	Birds / shelter
Prunus padus	Birds / shelter
Betula pendula	Birds / shelter

4.8 Plant Selection Suggestions

Additional project suggestions:

- Crocus species will attract insects in spring.
- Bird boxes and bat boxes can be made and fitted to existing trees.
- A drystone dyke can be restored to provide a habitat for plants and insects.
- Some areas could be designated as wildflower meadows and maintained by cutting once a year after flowering is complete, grass clipping will need to be removed.

Trees for Damp Soil	**Average Height**
Alder (Alnus glutinosa) *Rounded green leaves, yellow or purple catkins, February to April deciduous*	10m
Aspen (Populus tremula) *Pale green leaves which flutter in the wind, small catkins, February/March, deciduous*	15m
Elder (Sambucus nigra) *Mid-green leaves, creamy-white flowers, June/July, black berries, deciduous*	6m
Sallow (Salix cineria) *Downy grey-green leaves, silvery-white catkins, March/April, deciduous*	10m
Trees and Shrubs that Tolerate Acid Soil	**Average Height**
Alder (Alnus glutinosa)	10m
Aspen (Populus termula)	15m
Beech (Fagus sylvatica)	30m
Crab Apple (Malus sylvestris)	9m
Hawthorn (Crataegus monogyna)	9m
Juniper (Juniperus communis)	4m
Rowan (Sorbus aucuparia)	12m
Scots Pine (Pinus sylvatica)	30m
Sessile Oak (Quercus petraea)	30m
Silver Birch (Betula penula)	12m

4.8 Plant Selection Suggestions

Spring Plants for Damp, Woodland Soils	Average Height
Primrose (Primula vulgaris) *Deeply veined leaves, pale yellow, highly scented flowers, March/April, perennial*	15cm
Oslip (Primula elatoir) *Veined, hairy leaves, small pale yellow flowers, April/May, perennial*	20cm
Trout Lily (Erythronium americanum) *Mottled green and brown leaves, single bright yellow flowers, April, perennial*	20cm
Dog's Tooth Violet (Erythronium dens-canis) *Mottled green and brown leaves, single purple flowers with swept-back petals, perennial tuber*	20cm
Wood Lily (Trillium ovatum) *Diamond-shaped green leaves, small three-petalled flowers changing from white to pink, April/May, perennial*	25cm
Trillium Erectum *Diamond-shaped green leaves, small three-petalled crimson flowers, April/May, perennial rhizome*	40cm
Spring Plants for Average Woodland Soils	**Average Height**
Bluebell (Hyacinthoides non-scripta) *Linear leaves, violet blue nodding bell-shaped flowers, April/May, perennial bulb*	40cm
Ramsons Garlic (Allium ursinum) *Broad leaves with strong garlic aroma, large rounded umbel of white starry flowers, April to June, perennial bulb*	15cm
Wood Anemone (Anemone nemorosa) *Deeply decided leaves, white cup-shaped flowers, March to May perennial rhizome*	15cm

4.8 Plant Selection Suggestions

Anemone Nemorosa 'Robinsoniana' *Large pale lavender flowers, March to May, perennial rhizome*	15cm
Anemone Nemorosa 'Allenii' *Large lavender flowers, paler on the outside, March to May, perennial rhizome*	15cm
Yellow Wood Anemone *Divided leaves, small yellow buttercup-type flowers, March to May, perennial rhizome*	15cm
Summer Plants for the Woodland Edge	**Average Height**
Red Campion (Silene dioica) *Linear to oval leaves, bright rose-pink flowers, May to September, perennial*	60cm
Foxglove (Digitalis purpurea) *Large, soft grey-green leaves, spires of purple tubular flowers, spotted interiors, May/June, biennial. Note: all parts are poisonous*	1-1.5cm
Yellow Foxglove (Digitalis Lutea) *Glossy dark green leaves, spires of pale yellow flowers, May/June, perennial*	1m
Dusky Cranesbill (Geranium phaeum) *Broad dark green leaves, dark purple flowers, May to September, evergreen*	60cm
Herb-Robert (Lamium galeobdolon) *Fern-like leaves, small bright pink flowers, May to September, annual*	60cm
Yellow Archangel *Heart shaped leaves, tubular yellow flowers, July, evergreen perennial*	45cm
Columbine (Aquilegia vulgaris) *Bluish-green lacy foliage, violet-blue or purple nodding flowers with hooked spires, June, perennial*	45cm

4.8 Plant Selection Suggestions

Nora Barlow (Aquilegia vulgaris) *Green lacy foliage, three tone pink, lime green and white double flowers, June, perennial*	45cm
Autumn and Winter Flowers for the Woodland Floor	Average Height
Snowdrop (Galanthus nivalis) *Grey-green linear leaves, white slightly scented flowers with green marking, February, perennial*	15-20cm
Galanthus Nivalis 'Flore Pleno' *Large double white flowers, February, perennial bulb*	20cm
Winter Aconite (Eranthis hyemalis) *Green leaf rosettes, bright yellow cup-shaped flowers, February, perennial*	10cm
Sweet Violet (Viola odorata) *Heart-shaped leaves, scented violet flowers, February to April and sometimes intermittently in autumn, perennial*	7.5cm
Early Dog Violet (Viola reichenbachiana) *Heart-shaped leaves, scented flowers, March to May, perennial*	7.5cm
Autumn Cyclamen (Cyclamen hederifolium) *Heart-shaped grey-green leaves marked with silver, deep pink flowers, August to November, perennial tuber. Note: tuber is poisonous*	15cm
Cyclamen Purpurascens *Rounded green leaves, rose-pink fragrant flowers, July to September, perennial tuber. Note: tuber is poisonous*	10cm
Meadow Saffron (Colchicum autumnale) *Small lilac golden shaped flowers, September, leaves appear later, perennial corm. Note: all parts of the plant are poisonous*	15cm

4.9 Green Roofs and Green Walls

4.9.1 Landscape Institute Lecture on Green Roofs - 20/10/04

Lecture given by Dr Alan Rees-Torr of Blackdown Horticultural consultants. They have delivered green roofs for 6 years and have done a great deal of research pertaining to their utility etc.

There are a great many benefits not just a reduction in visual impact.

4.9.2 There are two types of green roof:

Intensive systems – effectively rooftop gardens on flat roofs, these are not possible as retro-fit options due to the rood loading. Deep soil 300mm, trees etc can lead to a roof loading of 100's of kg/m2. They also require irrigation and high levels of maintenance.

Extensive systems – lightweight thin layer 60-100mm of soil/ growing medium. Their roof loadings are about 90-95kg/m2 compared with 50-55kg/m2 for a slated roof (figures for 100mm substrate depth).

- Suitable for flat and pitched (up to 30o) roofs.
- Suitable for retro-fitting.
- No irrigation required.
- 1 or 2 visits per year to inspect.

4.9.3 Main types of green roof covering.

All of these will have a waterproof layer, then a protection layer, then a drainage layer and only then the substrate. Contractors take the responsibility for the waterproof layer and this is tested before any installation of the green roof.

- Thin sedum (a native semi-succulent plant, with good drought resistance, low growing) mat. 20-40mm. Substrate is a bit too thin to provide maximal benefit, and not recommended but can work on retro-fits on roofs whose loadings are low.
- Thicker sedum and other species mat, pre-grown (still low growing). 60-100mm deep. Provides maximal benefits for substrate depth/ roof loading. A neat solution potentially for urban areas.
- Both the above use pre grown mats that are rolled out like garden turf.
- Thicker mixed species, plug planting and seeding of substrate bonded with mulch (will have a shaggier appearance). 60-100mm deep. Provides maximal benefits for substrate depth/ roof loading. A solution for urban areas which are not too bothered about a neat roof.
- 100+mm substrate depth. So called "brown roof". Substrate from the site and left to colonise naturally. This works best in the growing season, only suitable for flat roofs. Great for recreation of wildlife rich brownfield sites. Lack of disturbance of rood habitat will mean birds will nest there.

All roof loadings are calculated using extreme events of rainfall, snowfall etc.

4.9.4 Green Roofs in Europe.

The UK is way behind Europe, particularly Germany and Switzerland. In Europe there is 125,000,000m2 of green roofs. 15,000,000m2 per year being created. Germany alone has 84,000,000m2 and 12,000,000m2 created annually.

4.9 Green Roofs and Green Walls

There are some old green roofs, one on a Swiss covered reservoir is 90 years old, has 25,000 orchids on it and is a SSSI !

In Berlin there is a requirement to have green roofs on all large buildings to reduce storm water run-off. This is the key to the benefits of green roofs, they reduce many of the impacts of a buildings.

4.9.5 Benefits of Green Roofs.

- Reduce rainwater run-off by 50-70%. So they don't overload drains causing combined sewage outflows to overflow into watercourses adversely impacting their quality (a major issue in the Monklands area). Reduce potential SUDS areas. Ken Livingstone is talking about a run-off tax for buildings in London, this may catch on in the UK where urban sewers can't cope with the massive increases in run-off caused by development.
- Extended life of the waterproof layer on the roof, no UV or major thermal swings.
- Better thermal performance. Reducing the building's energy requirements.
- Better acoustic insulation. Muffles sound from entertainment facilities .
- Reduced land take for conservation mitigation.
- Reduced particulate matter in the local atmosphere (plants accumulate this).
- Increased release of water vapour in dry urban environments.

In the future water could be collected from the roof and used in the building reducing mains water demand.

These are the key issues that developers and planners will be interested in. It does cost more than a conventional roof but the added value it gives exceeds the extra cost.

4.9.6 Environmental benefits that are harder to quantify are:

- Footprint replacement. You can move the habitat you are building on, onto the roof, within reason. This will work best with habitats on brownfield sites (not ancient woodland), Vacant and Derelict land as the substrate can be used as part of the green roof system.
- Limiting resource use/ reducing arising from development. On brownfield sites or bings (spoil heaps) the surface substrate can be crushed and used on the roof (provided it is not contaminated) reducing vehicle movements and landfill tax charges.
- Maintaining brownfield habitat, which is key for beetles, spiders, birds etc.

In the UK there is 200,000,000m2 of easily greenable roofs (think of all those supermarkets and B&Qs all over the UK). If 1mm of rain falls then this leads to 200,000 tons of water instantly discharged into the drains.

If this was taken forward in London alone then 45,000,000 tons less rainwater would be discharged into drains and 105 million tons discharged to the atmosphere. All this with no land take.

4.9.7 Key issues for construction of green roofs.

- They need to be installed after all other construction work has been completed. This minimises the possibility of damage to them.

- Beware of in experienced providers; there are no regulations or minimum standards yet. Germany as they have been doing it for 50+ years.
- A diverse plant community will be more stable than a monoculture.
- The design of the roof edges is important to work with the green rood principle.

4.9.8 Green Roofs and Solar Water Heaters or Photo-Voltaic cells.

The two are apparently complimentary as the vegetation reduces longwave thermal radiation improving the efficiency of the panels.

Websites
www.greenroof.co.uk; http://www.kalzipgallery.com/root/nature/; www.livingroofs.co.uk

4.9.9 Green Walls:

As with green roofs, green walls provide another option to incorporate Biodiversity when space on a development site is limited and offer many of the same benefits: provide cooling and insulation, and softening the visual impact of constructions. Climbing plants should be encouraged to create habitats for birds, insects and small mammals.

4.10 Boundaries including Hedgerows

4.10.1 Hedges and Field Boundaries

- All fields have boundaries-hedges, fences, walls, ditches, grass strips or the edge of an adjacent wood, watercourse or other non-crop area. They offer considerable potential for each and every farm to maintain features which are of importance to wildlife and landscape.

4.10.2 ALWAYS

- Give the field boundary as much care and attention as the crop. It requires special management.
- Leave at least one metre of natural vegetation between the field boundary (hedge, fence, wall, etc.) and the crop.
- Identify and rank all boundaries on the farm for their wildlife, landscape and historical importance. Draw up a written long-term plan for their management.
- Avoid the inadvertent use of pesticides and fertilisers on the field boundary. Consider creating additional grassy ridges to help natural pest control in crops.

4.10.3 TRY TO

- Manage or create field boundaries to make the most of the available potential.
- Identify and give priority to those boundaries which act as important links between wildlife areas, both on and off the farm.
- Manage field boundaries in conjunction with adjacent habitats, both on and off the farm.
- Clear ditches and cut hedges either on a minimum two to three year cycle or on a coppicing or laying rotation. Work in the season which will reduce disturbance to wildlife.

4.10.4 AVOID

- The removal of boundary structures or the replacement of walls and hedges by fences.

4.10.5 Fencing

A wide variety of fencing materials and designs are available for all situations, timber fencing is biodiversity friendly as it provides a habitat for many species.

4.10.6 Drystone dyking

Fact: Drystone Dykes (called 'drystone walls' south of the border) are the original environmentally sound field boundaries. Today over 80% of dykes are in need of repair, and we are in danger of losing an important landscaping feature that shapes our countryside.

Action: Repairing or building a drystone dyke is like a 3D jigsaw puzzle - sometimes frustrating, but always rewarding. The dykes that we build could last for 100 years.

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