# Strategic Environmental Assessment (SEA): Environmental Report for Shetland Islands Council Supplementary Guidance Onshore Wind Energy

**July 2017**

Shetland
Islands Council

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# SHETLAND ISLANDS COUNCIL SUPPLEMENTARY GUIDANCE: ONSHORE WIND ENERGY

## SEA ENVIRONMENTAL REPORT

## PREFACE

This document is an updated SEA for the Onshore Wind Energy Supplementary Guidance (Onshore Wind SG), which is approved by Shetland Islands Council but not currently adopted). It is based upon the original SEA for the Council's Wind Energy Development Interim Planning Policy (IPP) that was produced by Natural Capital in 2010. The reason why we have updated that original SEA, rather than undertaking a completely new assessment is based upon the following considerations:

The Consultation Authorities[1] agreed with the Council's determination that there is no policy or proposal in Onshore Wind SG that would have a significant environmental effect that hasn't already been considered as part of the SEA Environmental Report for Interim Planning Policy: Wind Energy Development.

SEPA and SNH agreed with the Council's determination that there was no need to prepare a further SEA for the Onshore Wind SG, however, HS (now HES) pointed out that the Council did not fully complete the SEA for the Council's Wind Energy Development IPP because it did not adopt the SEA or produce a post-adoption statement.

HES suggested that the SEA already commenced should be completed and the Council decided to follow that course. However, before proceeding to adopting the SEA and publishing the post-adoption statement, the Council concluded, in agreement with the consultation authorities, that it required updating. That process is now complete and this document incorporates current legislative and policy references as well as current baseline data.

[1] Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH) and Historic Environment Scotland (HES, formerly Historic Scotland, HS)

# SHETLAND ISLANDS COUNCIL SUPPLEMENTARY GUIDANCE: ONSHORE WIND ENERGY

# SEA ENVIRONMENTAL REPORT NON-TECHNICAL SUMMARY

## 1 INTRODUCTION

### 1.1 STATUTORY CONTEXT FOR THE SEA

The Environmental Assessment (Scotland) Act 2005 (the 2005 Act) is the statutory mechanism by which the requirements of the European Directive 2001/42/EC – "On the assessment of the effects of certain plans and programmes on the environment" (known as the Strategic Environmental Assessment or SEA Directive) are delivered in Scotland. The purpose of the SEA Directive is twofold. Firstly it aims to provide for a high level of protection of the environment and secondly ensure that environmental considerations are taken into account in the preparation and adoption of plans. This should promote sustainable development as part of the planning process.

Current guidance (Scottish Government's Strategic Environmental Assessment Guidance, 2013) confirms that SEA will be required for all plans and strategies that are likely to have a significant effect on the environment.

Shetland Islands Council (SIC) recognises that the delivery of its Supplementary Guidance: Onshore Wind Energy (Onshore Wind Energy SG) Policies could, if not managed sustainably, result in significant impacts on the environment. It is therefore appropriate that a plan of this nature should be subject to SEA and appraised fully so that any possible negative effects can be mitigated and the positive effects strengthened as far as is possible.

### 1.2 PURPOSE OF THE ENVIRONMENTAL REPORT

The purpose of this Environmental Report (ER) is to set out the findings of an environmental assessment of Shetland Islands Council Onshore Wind Energy SG. In accordance with Part 2 of the Environmental Assessment (Scotland) Act 2005, the ER identifies, describes and evaluates the likely significant effects on the environment of implementing the Onshore Wind Energy SG and the reasonable alternatives that have been assessed.

This report updates the SEA undertaken for the consultation on the Wind Energy Development Interim Planning Policy published in February 2010 (Natural Capital for Shetland Islands Council (February 2010) Interim Planning Policy: Wind Energy Development SEA Environmental Report). That report was provided for the Consultation Authorities and the general public during public consultation on the Interim Planning Policy: Wind Energy Development (Wind Energy Development IPP). The Onshore Wind Energy SG is the current expression of policy and guidance on Onshore Wind Energy that has developed from the Wind Energy Development IPP and is the result of further public consultations.

# 2 THE ONSHORE WIND ENERGY SG AND ITS CONTEXT

## 2.1 KEY INFORMATION

Box NTS 1 Summarises the key information about the Onshore Wind Energy SG.

**Box NTS 1 Summary of Key Facts relating to the Onshore Wind Energy SG**
**Name of Responsible Authority:** Shetland Islands Council
**Title of Plan/Programme:** Supplementary Guidance: Onshore Wind Energy
**What prompted the Plan:** Scottish Planning Policy (SPP) requires all Planning Authorities to establish a spatial framework identifying those areas that are likely to be most appropriate for onshore wind farms as a guide for developers and communities; the Onshore Wind Energy SG provides that framework and associated guidance.
**Plan Subject:** Sets the framework by which wind energy projects in Shetland will be developed.
**Period covered by Plan:** Shetland Islands Council adopted the current Local Development Plan (LDP) in September 2014 and the LDP is due to be replaced in 2019.
**Plan Area:** Shetland Islands
**Plan Purpose/Objectives:** To provide location guidance; assessment criteria; a policy framework for S36 Energy Consultations; and guidance for micro-turbine schemes within Shetland
**Contact Point**: Austin Taylor, Natural Heritage Officer, Planning Service, Shetland Islands Council

## 2.2 OUTLINE AND OBJECTIVES OF THE ONSHORE WIND ENERGY SG

The relevant Shetland Local Development Plan (LDP) Policy, Spatial Framework Policies and Development Criteria Policies Onshore Wind Energy SG are listed in Tables NTS 1and NTS 2below. These Policies are the drivers behind the Onshore Wind Energy SG and have shaped the development of the plan. The Environmental Report focuses on an assessment of these key features.

**Table NTS 1: Onshore Wind Energy SG Policies**

| | |
|---|---|
| Policy LDP RE1 | LDP RE1 Renewable Energy |
| SG Spatial Policy 1 | Areas where wind farms will not be acceptable |
| SG Spatial Policy 2 | Areas of Significant Protection |
| SG Spatial Policy 3 | Areas with potential for wind farm development |

**Table NTS 2: Development Criteria Policies**

| | |
|---|---|
| DC1 | Landscape and Visual Impact |
| DC2 | Cumulative Impact |
| DC3 | Natural Heritage |
| DC4 | Impacts on communities |
| DC5 | Water Resources |
| DC6 | Decommissioning |
| DC7 | Historic Environment |

# 3 UPDATING THE SEA - PROCESS

## 3.1 INTRODUCTION

The approach to this update of the SEA for the 2010 Wind Energy IPP has followed a series of defined stages:

- Review of changes to relevant plans and programmes that were relevant to the preparation of the Onshore Wind Energy SG or that underpin the Onshore Wind Energy SG and which provide direction for the SEA of the Onshore Wind Energy SG;
- Identification and review of changes to relevant aspects of the current state of the environment that relate to Onshore Wind Energy and that could be influenced by the implementation of the Onshore Wind Energy SG where these have changed since publication of the SEA for the Wind Energy IPP;
- Identification of changes (or additions) to existing and potential future environmental issues that may influence or be influenced by the Onshore Wind Energy SG and that were identified in the SEA for the Wind Energy IPP;
- Onshore Wind Energy SG
- environmental assessment so as to be an assessment of the policies within the Onshore Wind Energy SG; and
- Update the mitigation and proposals for monitoring the implementation of the Onshore Wind Energy SG.

## 3.2 SEA OBJECTIVES

The SEA objectives defined in the Onshore Wind Energy SG have been reviewed and the following revisions made:

- The environmental topics of Schedule 3 of the Scottish Act (no change);
- The Policies within the Onshore Wind Energy SG (previously those within the Wind Energy IPP);
- Objectives from other relevant plans and programmes (no change);
- Environmental issues and problems identified as part of the baseline analysis during the scoping stage (no change).

# 4 ENVIRONMENTAL ASSESSMENT OF THE ONSHORE WIND ENERGY SG

## 4.1 ALTERNATIVES AND DEVELOPMENT OF THE PLAN

The SEA Directive and the 2005 Act require the Environmental Report to consider the impacts of alternatives to the proposed plan as part of the SEA. There have not been any literal "alternatives" to the Onshore Wind Energy SG since the SIC has sought an integrated and balanced approach to policy development right from the start. Rather than developing alternative policies the SIC has evolved its policy document in an iterative way making use of the SEA process during this "evolution" to remove any undesirable environmental effects, should they exist, and to make sure that environmental sustainability elements within the policies were strengthened where possible.

As a result of this iterative assessment and consultation process some of the supporting text and objectives within the Onshore Wind Energy SG have been refined. The following summarises the overall impact that the SEA process has had in the evolution of the Onshore Wind Energy SG and the key changes made:

- Widening of the understanding of the impact that developments can have through interactions with consultees;
- Consideration of flood risks associated with future developments;
- Recognition of the need to consider embodied energy and carbon associated with the manufacturing and construction of plant and equipment used in wind energy developments.

## 4.2 FUTURE OF THE ENVIRONMENT IN THE ABSENCE OF THE ONSHORE WIND ENERGY SG

The Scottish Government approved the Viking Energy Wind Farm in Shetland in 2011 and this large wind farm will have a bearing on the development of other large wind farms in Shetland. The absence of up to date wind energy development policies (which the Onshore Wind Energy SG presents) would mean that such development may proceed without appropriate consideration of the social, economic and environmental impacts such projects would have.

The LDP encourages new development that utilises low carbon or renewable energy technologies. Specifically, the LDP establishes general requirements that minimise the use of energy and encourage renewable energy developments that contribute to the sustainable development of Shetland. Such proposals will be supported where it can be demonstrated that there are no unacceptable impacts on people (benefits and disbenefits for communities and tourism and recreation interests), the natural and water environment, landscape, historic environment and the built environment and cultural heritage of Shetland.

However, the Onshore Wind Energy SG contains the spatial framework for large scale wind energy developments of 20MW and above generating capacity and provides detailed guidance on renewable developments.

A cable connecting Shetland to the Scottish mainland is likely to be required for any major development in renewable energy in Shetland and this could facilitate further opportunities in development of marine renewable energy in the future.

### 4.3 ENVIRONMENTAL BASELINE

Details of the current state of the environment in the study area and how this might change in the future in the absence of the Onshore Wind Energy SG and the environmental characteristics of the area likely to be affected by the plan were identified and are described in the Environmental Report.

Key environmental issues highlighted by the baseline data included biodiversity (flora and fauna), climate change, health, hydrology and flooding, material assets and waste management, landscape and visual effects and cultural heritage.

Environmental baseline data were taken into account when assessing the Onshore Wind Energy SG policies including existing landscape, ecological, cultural heritage, and water features and statutory and local designations. This helped ensure that environmental considerations played a key role in ensuring that all policies exist within a framework which has taken full account of relevant environmental considerations.

Schedule 2 of the Scottish Act requires that the Environmental Report includes a description of existing environmental problems, especially those relating to any areas of particular environmental importance. The purpose of this section of the Environmental Report is to explore the key environmental issues that are relevant to the SIC and whether the Onshore Wind Energy SG is likely to have an effect either positively or negatively on these issues. This review of environmental problems, issues and opportunities across Shetland, both strategically and in the context of the Onshore Wind Energy SG, has been undertaken by the environmental assessment team.

### 4.4 ENVIRONMENTAL IMPLICATIONS

Building on the assessment that was undertaken for the individual policies of the Onshore Wind Energy SG, the Onshore Wind Energy SG has been considered as a whole in the context of the SEA Topics. The Environmental Report outlines the environmental effects that are predicted to arise as a result of the adoption of the draft Onshore Wind Energy SG and are summarised. In reaching the conclusions included in the Environmental Report, professional judgement has also been exercised in considering the likelihood of secondary, cumulative, indirect and synergistic effects arising from the adoption of the proposed Onshore Wind Energy SG.

Overall, the assessment finds that the adoption of the plan will result in an improvement on the potential environmental consequences of adopting the “do minimum” approach.

Where appropriate, mitigation that is contained within the Plan is outlined and further suggestions for strengthening this are made.

### 4.5 POSITIVE IMPLICATIONS

In general terms the Onshore Wind Energy SG does not generate any strongly negative environmental effects and puts into place a suite of Development Criteria that will mitigate inappropriate and environmentally damaging wind energy development. Overall the Onshore Wind Energy SG is likely to deliver

a positive contribution to the broad environmental trends for Shetland. In the absence of the policies and Development Criteria the evolution of the SEA topic areas in general would be likely to show an adverse trend.

Overall, in environmental terms, the Onshore Wind Energy SG aims to:

- facilitate the creation of more sustainable forms of energy generation (from renewables) in line with the SIC Corporate Plan (2008);
- identify spatially, those geographical areas of Shetland least able to support wind energy because of their environmental, social, historical or visual sensitivity;
- outline the specific criteria planning applications for wind energy development must meet, in order to minimise the potential environmental impacts of wind energy development (e.g. air quality, water quality, visual etc);
- emphasise the importance of the protection of the natural and cultural heritage designations;
- ensure that new developments are environmentally sustainable. The suite of policies attempt to address:

*Climatic Factors*

Through:

- outlining the circumstances under which wind energy development can take place in order to optimise the carbon saving potential of this form of renewable energy while ensuring Shetland's environment and unique character are protected;
- seeking to encourage the application of sustainable development principles (that will include addressing the use of fossil fuels, energy efficiency, the role of renewables and climate change issues) through the requirements built into key overarching policies.

*Use of Natural Resources and Material Assets*

Through:

- ensuring that waste is minimised and that reused or recycled materials are used wherever possible in wind energy development;
- directing development of wind energy away from inappropriate land (such as locally protected areas).

*Population and Health*

Through:

- seeking to encourage the application of best practice principles, that will include: addressing emissions of noise, shadow flicker from aerogenerators and other nuisances that can affect public health and well-being, addressing traffic and transport issues, addressing the need to maintain visual amenity, ensuring that water supply and quality is not affected by

developments and through the requirements built into key overarching policies and development criteria;
- Ensuring that the cumulative impact of numerous wind energy developments and their associated infrastructure is taken into consideration when assessing the impacts of a single wind energy development application.

*Air*

Through:

- facilitating the growth of renewable energy in place of existing energy production, which relies on fossil fuels (e.g. oil or solid fuel such as peat);
- ensuring that nuisances caused by construction (noise, dust, etc) are minimised.

*Soils and Geology*

Through:

- outlining a requirement for wind energy development to minimise disturbance of soil and peat in order to protect against peat slip and carbon emissions;
- protecting sites designated for their geological importance (including Sites of Special Scientific Interest and the Shetland Geopark).

*Water*

Through:

- seeking to encourage the application of best practice principles (that will include surface water drainage and management, groundwater/hydrogeological survey and management, site- specific measures to minimise pollution etc) through the requirements built into specific Development Criteria.

*Landscape, Biodiversity and Cultural Heritage*

Through:

- seeking to encourage the application of sustainable development principles (that include recognising the importance of biodiversity, landscape and cultural heritage and the implementation of measures such as assessing the landscape and ecological value of development proposals, assessing archaeological remains and historic features and implementing measures for their preservation and recording, etc) through the requirements built into specific Development Criteria;
- identifying spatially, those geographical areas of Shetland least able to support wind energy because of their environmental, social, historical or visual sensitivity;
- encouraging the adoption of environmental management systems and environmental performance standards to address the effects of

developments on biodiversity, landscape and seascape, the historic environment and cultural heritage.

### 4.6 INDIRECT ENVIRONMENTAL IMPLICATIONS

Notwithstanding the above positive elements it is likely that there will be some environmental implications arising from any new wind energy developments that ultimately will come on stream as a consequence of this Onshore Wind Energy SG. Some issues are almost inevitable, and would arise as a result of any new type of development and these include:

- emissions of greenhouse gases from energy use and traffic both during construction and operational activities;
- embodied energy and carbon in plant and equipment used in wind energy developments;
- an increased burden on air quality from emissions generated by plant and equipment as well as traffic associated with any developments;
- threats to the water and soil environment from construction activities and changes to on-site drainage as a result of the development.

Other issues are highly dependent on the nature, scale and location of particular developments. It is conceivable that some future developments might have implications for biodiversity (for example damage to habitats, disturbance of species and loss or damage to particular flora and fauna), landscape and historic character (including visual impact, effects on landscape and historic features) and wider transport impacts during construction, operation and maintenance.

Although the SIC can and does influence developers to adopt sustainable development principles and best practice in avoiding and/or mitigating any of these effects it has no direct control over the operation of individual developments. It is assumed that some of the above implications would be picked up more specifically by controls exerted by other agencies such as Scottish Natural Heritage, Scottish Environment Protection Agency (SEPA) and Historic Environment Scotland.

### 4.7 POSSIBLE CUMULATIVE EFFECTS ASSOCIATED WITH THE ONSHORE WIND ENERGY SG

A summary of the assessment of the possible cumulative effects is given in the Environmental Report. Clearly to deal with some of the effects there will need to be supporting action at the Government or Agency level, for example to help deal with:

- **energy** supply and **$CO_2$** emissions;
- reliance on **fossil fuels**;
- **embodied energy** and **carbon**;
- **traffic** and transportation alternatives;
- **waste** management and disposal;
- **wate**r supply and treatment; and
- wider **biodiversity and geodiversity conservation** issues.

However the Onshore Wind Energy SG has a significant role to play in contributing to the management and mitigation of those effects associated with the role of the SIC as the Planning Authority. In particular the Onshore Wind Energy SG policies and Development Criteria can:

- steer new wind energy developments away from sites of nature conservation, landscape and seascape, historic and cultural heritage importance;
- address the contribution of the renewable energy development sector in Shetland to more global level issues (e.g. climate change, use of fossil fuels and energy, waste generation, loss of biodiversity) through influencing action at the local (Shetland) level;
- address resource use and material asset issues through encouraging more sustainable design and construction within new wind farm developments (e.g. effective waste minimisation, use of low embodied carbon materials in manufacture, fabrication and construction of turbines and associated infrastructure, sustainable sourcing of materials etc); and
- create the right development policy framework and approach to site design, location and construction that will help to provide proactive solutions to these problems.

### 4.8 PROPOSED MITIGATION

The precise effects of some of the Onshore Wind Energy SG overarching policies and Development Criteria are clearly going to be difficult to predict at a very local level. The effects, whether positive, negative or cumulative will depend on:

- how policies are implemented on the ground;
- the precise nature of any proposed wind energy developments that are taken forward;
- the environmental characteristics of the potential locations.

Mitigation has been developed within the wording of policies and in particular the Development Criteria and there were no cases where any of these were found to generate an overall negative environmental impact or clear, strong negative impacts on any of the SEA objectives. It is of course important to recognise that the policies and criteria must be simultaneously applied and not considered in isolation. Details of the proposed mitigation are described in full in the Environmental Report.

### 4.9 MONITORING

Monitoring of the effects of implementing the plan will be based on the performance of a set of key indicators. Monitoring will be undertaken by regimes currently in place for local authority infrastructure maintenance and also delivered by the environmental regulators.

Monitoring will rely on the continued day-to-day management and site knowledge of those managing land for which they have responsibility, and the ongoing activities of the environmental regulators.

## 5 NEXT STEPS

The following stages in the development of the Onshore Wind Energy SG and its environmental assessment are envisaged:

- This Environmental Report originally reported the findings of the SEA of the Wind Energy IPP and was published alongside the Wind Energy IPP in 2010.
- Following consultation on the Wind Energy IPP and the Environmental Report, the Wind Energy IPP was revised and updated taking account of the comments received.
- The Onshore Wind Energy SG has now been prepared in response to the consultations that the Council undertook on the Wind Energy IPP and, following extensive consultation on further drafts of the Onshore Wind Energy SG, that SG has now been finalised and Shetland Islands Council has approved it for adoption.
- This SEA has been updated to reflect the legislative, policy, technological, terminological and other matters that have changed since the Wind Energy IPP was completed and it will be published alongside an SEA Statement that will be made available to the Consultation Authorities and the public, setting out how the findings of consultation and the environmental assessment have been incorporated into the development of the Onshore Wind Energy SG.
- It is intended that this SEA for the Onshore Wind SG will be issued to the SEA Gateway for further review by the consultation authorities during summer 2017. Provided all the issues that they raise can be dealt with immediately upon receipt, the Onshore Wind Energy SG with accompanying SEA will be forwarded to Scottish Government with a notice that the Council intends to adopt the Onshore Wind SG.

## 6 COMMENTS

Any queries on the SEA of the Onshore Wind Energy SG should be addressed to:

Austin Taylor - Natural Heritage Officer
Planning Service
Shetland Islands Council
Train Shetland
Gremista Rd
Lerwick
Shetland
ZE1 0PX

Email: development.plans@shetland.gov.uk Telephone: 01595 744833

# SHETLAND ISLANDS COUNCIL SUPPLEMENTARY GUIDANCE: ONSHORE WIND ENERGY

# SEA ENVIRONMENTAL REPORT

## 1 INTRODUCTION

### 1.1 CONTEXT OF THE ONSHORE WIND ENERGY SG

#### 1.1.1 Statutory Context for the SEA

The Environmental Assessment (Scotland) Act 2005 (the 2005 Act) is the statutory mechanism by which the requirements of the European Directive 2001/42/EC – "On the assessment of the effects of certain plans and programmes on the environment" (known as the Strategic Environmental Assessment or SEA Directive) are delivered in Scotland. The purpose of the SEA Directive is twofold. Firstly it aims to provide for a high level of protection of the environment and secondly ensure that environmental considerations are taken into account in the preparation and adoption of plans. This should promote sustainable development as part of the planning process (see Section 1.4).

Current guidance (Scottish Government's Strategic Environmental Assessment Guidance, 2013) confirms that SEA will be required for all plans and strategies that are likely to have a significant effect on the environment.

The Council recognises that the delivery of its Onshore Wind Energy SG Policies could, if not managed sustainably, result in significant impacts on the environment. It is therefore appropriate that a plan of this nature should be subject to SEA and appraised fully so that any possible negative effects can be mitigated and the positive effects strengthened as far as is possible.

#### 1.1.2 Purpose of the Environmental Report

The purpose of this Environmental Report is to set out the findings of an environmental assessment of Shetland Islands Council Onshore Wind Energy SG. In accordance with Part 2 of the 2005 Act, the Environmental Report identifies, describes and evaluates the likely significant effects on the environment of implementing the Onshore Wind Energy SG and the reasonable alternatives that have been assessed.

The report is intended to provide this information for the Consultation Authorities (Scottish Natural Heritage, Scottish Environment Protection Agency and Historic Environment Scotland) and the general public during public consultation on the Wind Energy IPP and has been updated for the Onshore Wind Energy SG. Further information on consultation for the Wind Energy IPP and SEA is presented in Sections 1.5 and 2.7 and in Annex B.

#### 1.1.3 Sustainable Development

In March 2005 Scotland signed up to a new UK shared framework for sustainable development, "One future – different paths – UK Shared Framework for Sustainable Development", DEFRA (2005) which set out a common goal for sustainable development across the UK:

- "to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life for future generations"

This framework set out five shared principles of sustainable development:

- Living within Environmental Limits
- Ensuring a Strong, Healthy and Just Society
- Achieving a Sustainable Economy
- Promoting Good Governance
- Using Sound Science Responsibly

Scottish Ministers set out their aims for sustainable development in 'Choosing our Future – Scotland's Sustainable Development Strategy', The Scottish Executive (2005). The main thrust of the strategy is enshrined in four key goals:

- The well being of Scotland's people
- Supporting thriving communities
- Scotland's global contribution
- Protecting Scotland's natural heritage and resources

The Scottish Government in 2007 further developed these into five objectives:

- **Strategic Objective 1**: Wealthier and Fairer - Enable businesses and people to increase their wealth and more people to share fairly in that wealth.
- **Strategic Objective 2**: Healthier - Help people to sustain and improve their health, especially in disadvantaged communities, ensuring better, local and faster access to health care.
- **Strategic Objective 3**: Safer and Stronger - Help local communities to flourish, becoming stronger, safer place to live, offering improved opportunities and a better quality of life.
- **Strategic Objective 4**: Expand opportunities for Scots to succeed from nurture through to lifelong learning ensuring higher and more widely shared achievements.
- **Strategic Objective 5**: Improve Scotland's natural and built environment and the sustainable use and enjoyment of it.

There is a strong environmental strand running through the above goals and policies particularly Strategic Objective 5, so testing Shetland Islands Council's Onshore Wind Energy SG against the requirements of the SEA Act in Scotland will make sure that the Council's approach to development planning for construction and design is effective in protecting the environment whilst at the same time contributing to sustainable development.

Since this SEA was completed for the Wind Energy IPP there have been further developments in this field, notably:

The Climate Change (Scotland) Act 2009 created and informed a wide variety of initiatives, including the Climate Change Delivery Plan (which sets out what needs to be done to achieve emissions reductions to meet the statutory targets that are included in the Act) and the Climate Change Adaptation Framework, published in December 2009 that aims to build resilience and capacity for change.

Planning Circular 6/2013: Development Planning has updated guidance on the general duties in this area that set out in legislation and with which planning authorities must comply when preparing development plans. The following sections are relevant here:

“Sustainable Development & Climate Change

12. Section 3E of (The Town and Country Planning (Scotland) Act 1997, as inserted by The Planning etc. (Scotland) Act 2006) requires planning authorities to carry out their development planning functions with the objective of contributing to sustainable development. In doing so they must have regard to any guidance Scottish Ministers issue for this purpose. This guidance is included within Scottish Planning Policy (SPP).

13. Section 44 of the Climate Change (Scotland) Act 2009 sets out that public bodies (which includes planning authorities) must, in exercising their functions, act in the way best calculated to contribute to the delivery of the climate change targets set out in that Act. They must also operate in the way best calculated to help deliver any Programme for adaptation to climate change laid before the Scottish Parliament and in a way that they consider is most sustainable.

14. Section 72 of the Climate Change (Scotland) Act 2009 introduced section 3F into the Town and Country Planning (Scotland) Act 1997. Section 3F requires LDPs to include policies requiring all developments in the plan area to be designed so as to ensure that all new buildings avoid a specified and rising proportion of the projected greenhouse gas emissions from their use. This is calculated on the basis of the approved design and plans for the specific development, through the installation and operation of low and zero-carbon generating technologies.”

### 1.1.4 SEA Activities to Date

The Environmental Report brings the results of all of these activities together and then goes on to describe:

- an assessment of the Onshore Wind Energy SG Policies against the SEA Objectives, as laid out in the SEA Scoping Report (see Annex A);
- an assessment of the Onshore Wind Energy SG as a whole, including alternatives and cumulative effects (see Chapter 5); and
- the proposals for any mitigation measures, and monitoring of the implementation of the Onshore Wind Energy SG (see Sections 5.6 and 5.7).

The next steps for the SEA, including those for public consultation and finalisation and adoption of the Onshore Wind Energy SG are set out in Chapter 6. Box 1 summarises the key facts relating to the Onshore Wind Energy SG.

**Box 1 Summary of Key Facts relating to the Onshore Wind Energy SG**

**Name of Responsible Authority:** Shetland Islands Council

**Title of Plan/Programme:** Supplementary Guidance: Onshore Wind Energy
**What prompted the Plan:** Part 2 of The Planning etc. (Scotland) Act 2006 requires each council across Scotland to produce a Local Development Plan, which sets out the policy framework for the development of land in its area and comprises the LDP, together with associated Supplementary Guidance (SG). Such plans require the inclusion of a spatial framework identifying those areas that are likely to be most appropriate for onshore wind farms as a guide for developers and communities; this SG provides that spatial framework.
**Plan Subject:** Sets the framework by which wind energy projects in Shetland will be developed.
**Period covered by Plan:** Shetland Islands Council adopted the current Local Development Plan (LDP) in September 2014 and the LDP is due to be replaced in 2019.
**Frequency of Updates:** A review of LDP policies will occur every 5 years
**Plan Area:** Shetland Islands
**Plan Purpose/Objectives:** To provide location guidance; assessment criteria; a policy framework for S36 Energy Consultations; and guidance for micro-turbine schemes within Shetland
**Contact Point**: Austin Taylor, Natural Heritage Officer, Planning Service, Shetland Islands Council

## 1.2 Layout of the Report

The remainder of the document is structured as follows:

- Chapter 2: sets out the appraisal methodology including SEA guidance and the response to the statutory consultation;
- Chapter 3: describes the Onshore Wind Energy SG and its context together with the links with other relevant plans and programmes;
- Chapter 4: describes the environmental baseline and key environmental issues and discusses the future of the environment without the implementation of the Onshore Wind Energy SG;
- Chapter 5: presents the results of the environmental assessment including the assessment of alternatives, the proposed mitigation and proposals for monitoring; and
- Chapter 6: describes the next steps including the proposed stages and key milestones.

The main text is supported by the following annexes:

- Annex A: SEA Appraisal of Onshore Wind Energy SG Policies
- Annex B: Summary of Statutory Consultee Responses
- Annex C: SEA Scoping Report
- Annex D: Assessment of Cumulative Effects

# 2 APPRAISAL METHODOLOGY

## 2.1 INTRODUCTION

This section presents a summary of the methods used to carry out the environmental assessment of the Onshore Wind Energy SG. The approach to SEA is described first followed by the guidance that has been used to shape the development of the Environmental Report. This is then followed by a summary of the SEA objectives to be used in the assessment followed by a summary of the scoping process carried out by the Council. The assessment methods are set out in Section 2.6 and the chapter is concluded with a description of the response to the statutory consultation on the Scoping Report.

## 2.2 OVERALL APPROACH TO SEA

The approach to the SEA has followed a series of defined stages:

- review of relevant plans and programmes which both underpin the Onshore Wind Energy SG and which provide direction for the SEA of the Onshore Wind Energy SG (see Chapter 3, Table 3.3);
- identification and review of relevant aspects of the current state of the environment that relate to Onshore Wind Energy and that could be influenced by the implementation of the Onshore Wind Energy SG (see Section 4.2);
- identification of existing and potential future environmental issues which may influence or be influenced by the Onshore Wind Energy SG (see Section 4.3);
- identification of SEA objectives to guide the Onshore Wind Energy SG appraisal taking account of the objectives in other plans and programmes, the identified issues and the current baseline (see Section 2.4);
- scoping of environmental issues to be appraised in the SEA (see Section 2.5);
- environmental assessment of the policies within the Onshore Wind Energy SG (see Section 5.3 and Annex A); and
- establishing any appropriate mitigation and proposals for monitoring the implementation of the Onshore Wind Energy SG (see Section 5.6 and 5.7).

## 2.3 SEA GUIDANCE

The original version of this Environmental Report (February 2010) was prepared with reference to the following SEA legislation and guidance:

- The SEA Directive;
- The 2005 Act;
- Office of the Deputy Prime Minister (2005) A Practical Guide to the Strategic Environmental Assessment Directive;
- Scottish Executive (2003) Environmental Assessment of Development Plans, Interim Planning Advice;
- Scottish Executive (2006) SEA Toolkit;
- Guidance on the SEA Directive produced by the Office of the Deputy Prime Minister, which identifies a series of requirements for the SEA.

The main requirements set out in the Environmental Assessment (Scotland) Act 2005, Schedule 3 are summarised in Table 2.1 along with a comment as to their status in the SEA of the Onshore Wind Energy SG.

This updated SEA for the Onshore Wind Energy SG was prepared with reference to the following updated guidance:

- Scottish Government's Strategic Environmental Assessment Guidance, published 30 August 2013

**Table 2.1 SEA Directive Guidance**

| Requirements | | Response within SEA of Onshore Wind Energy SG |
|---|---|---|
| a) | Outline of the contents, main objectives of the plan and relationship with other relevant plans | Addressed within Sections 3.2 and 3.3 of this Environmental Report |
| b) | Relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan | Addressed within Table 4.19 of this Environmental Report |
| c) | Environmental characteristics of areas likely to be significantly affected | Addressed within Section 4 of this Environmental Report |
| d) | Existing environmental problems which are relevant to the plan | Addressed within Section 4.3 of this Environmental Report |
| e) | Environmental protection objectives established at international, Community or national level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation | Addressed within Section 2.4 and Table 2.2 of this Environmental Report |
| f) | Likely significant effects on the environment | Addressed within Section 5.4 and Annex D of this Environmental Report |
| g) | Measures envisaged to prevent, reduce and as fully as possible offset significant adverse effects on the environment of implementing the plan | Addressed within Section 5.6 and Annex D of this Environmental Report |
| h) | Outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties | Addressed within Section 5.2 of this Environmental Report |
| i) | Description of measures envisaged concerning monitoring in accordance with Article 10 | Addressed within Section 5.7 of this Environmental Report |
| j) | Non-technical summary of the information provided under the above headings | A non-technical summary of this Environmental Report appears at the beginning of this document |

## 2.4 SEA OBJECTIVES

The 2005 Act does not require the generation of SEA objectives by Shetland Islands Council to appraise the potential effects of the Onshore Wind Energy SG. However, environmental protection objectives from other policies, plans and programmes should be taken into consideration where they are appropriate. The development of specific SEA objectives and indicators is a recognised way in which environmental effects can be described, analysed and compared. SEA objectives will describe the intent and desired direction of environmental change, whilst indicators will measure the performance of the Onshore Wind Energy SG against these objectives (see Section 5.7).

To fulfil the requirements of the SEA Directive and Schedule 3 of the 2005 Act the SEA objectives should cover:

- '…. biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, landscape and the interrelationships between them.'

Table 2.2 summarises SEA objectives for the Onshore Wind Energy SG. The objectives were developed by the Council during the scoping stage and are designed to consolidate:

- the environmental topics of Schedule 3 of the Scottish Act ;
- the Policies within the Onshore Wind Energy SG;
- objectives from other relevant plans and programmes;
- environmental issues and problems identified as part of the baseline analysis during the scoping stage.

**Table 2.2 SEA Objectives for the Onshore Wind Energy SG – updated to include SEA Objectives form The Shetland Islands Council Local Development Plan SEA Final Environmental Report (2012)**

| SEA Topic | SEA Objectives |
|---|---|
| **Biodiversity (Flora and Fauna)** | 1. To further the conservation of biodiversity |
| **Population** | 2. To improve the quality of life for people and communities across Shetland |
| **Human Health** | 3. To improve the quality of health in Shetland |
| **Soils and Geology** | 4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner |
| **Water** | 5. To protect and enhance freshwater and marine water quality<br>6. To ensure that Shetland's water resources are used effectively and sustainably |
| **Air** | 7. To protect Shetland's air quality |
| **Climatic Factors** | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO_2$ reduction target (by 2050, established in the Climate Change (Scotland) Act 2009)<br>9. Facilitate the development and use of energy generated from renewable energy technologies and contribute to meeting climate change greenhouse gas reduction<br>10. To adapt to the predicted effects of climate change such as flood risk<br>11. To reduce or manage flood risk with and from any new developments |
| **Material Assets** | 12. To promote the sustainable use of Shetland's natural resources<br>13. To provide opportunities for sustainable waste management |
| **Cultural Heritage** | 14. To conserve and protect the historic environment including buildings, archaeological sites and other culturally important features<br>15. To safeguard distinctive cultural heritage features and their settings through the responsible design and siting of development |

| | |
|---|---|
| **Landscape and Built Environment** | 16. To protect the special qualities and characteristics of Shetland's landscapes and seascapes<br>17. To improve those landscapes and seascapes that are degraded<br>18. To respect urban form, settlement pattern or identity<br>19. Improve the quality and design of the built environment |

## 2.5 SCOPING THE APPRAISAL

In accordance with the 2005 Act, the Council considered whether the environmental effects (positive and negative) of the Wind Energy IPP were likely to be significant. This initial scoping assessment was based on preliminary information about the scope of objectives and nature of the developments likely to feature in the emerging Wind Energy IPP, the known environmental baseline likely to be affected by the plan and the likely environmental issues.

The scoping process concluded that no SEA issues should be scoped out and so all the SEA objectives were taken forward for assessment against the policies of the Wind Energy IPP. This remained the case for the Onshore Wind Energy SG.

## 2.6 ASSESSMENT METHODS

The Onshore Wind Energy SG contains the Spatial Framework and 7 Development Criteria policies; the overarching policy RE1 Renewable Energy sits within the Local Development Plan 2012 (LDP). In order to assess the potential effects of these policies, and in doing so evaluate the effects of the Onshore Wind Energy SG, a framework approach was used. The SEA framework (see Table 2.3) was developed following the work undertaken during the scoping stage. It was based on the SEA objectives presented in Section 2.4 and Table 2.2 above. A set of appraisal criteria was developed, drawn from the literature, the study team's own experience and feedback from the Council. These criteria have been used to focus the appraisal of the Spatial Framework and Policies against the SEA objectives.

**Table 2.3 SEA Appraisal Framework**

| SEA Topic | SEA Objectives | SEA Questions |
|---|---|---|
| **Biodiversity (Flora and Fauna)** | 8. To further the conservation of biodiversity | • Does the policy impact on plants and animals?<br>• Does the policy conserve and protect biodiversity?<br>• Does the policy contribute to the aims of the Local Biodiversity Action Plan?<br>• Does the policy contribute to public awareness and understanding about biodiversity? |
| **Population** | 9. To improve the quality of life for people and communities across Shetland | • Does the policy contribute towards improving quality of life for people and communities across Shetland |
| **Human Health** | 10. To improve the quality of health in Shetland | • Does the policy contribute towards improving the quality of health associated with the environment (Air quality, water quality, noise and vibration)?<br>• Does the policy contribute to the goal of creating active, healthy lifestyles for Shetland islanders?<br>• Does the policy contribute towards improving access to health and care services for all Shetland islanders? |
| **Soil** | 11. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner | • Does the policy protect Shetland's peat, soil and geological resources?<br>• Does the policy encourage the use of them only in a sustainable manner? |
| **Water** | 12. To protect and enhance freshwater and marine water quality<br>13. To ensure that Shetland's water resources are used effectively and sustainably | • Does the policy protect and enhance freshwater and marine water quality?<br>• Does the policy ensure that Shetland's water resources are used effectively and sustainably?<br>• Does the policy protect the integrity of the physical aspect of the water environment?<br>• Does the policy promote a sustainable drainage infrastructure? |
| **Air** | 14. To protect Shetland's air quality | • Does the policy pose any risks to air quality?<br>• Does the policy encourage activities that could contribute to lowering air quality? |

| SEA Topic | SEA Objectives | SEA Questions |
|---|---|---|
| **Climatic Factors** | 15. To reduce greenhouse gas emissions and to contribute to Scotland's 80% $CO_2$ reduction target<br>16. Facilitate the development and use of energy generated from renewable energy technologies and contribute to meeting climate change greenhouse gas reduction<br>17. To adapt to the predicted effects of climate change, such as flood risk<br>18. To reduce or manage flood risk with and from any new developments | • Does the policy help in reducing greenhouse gas emissions?<br>• Does the policy facilitate the development and use of energy generated from renewable energy technologies and contribute to meeting climate change greenhouse gas reduction<br>• Does the policy take account of the predicted effects of climate change, and adapt appropriately?<br>• Is the risk or likelihood of flooding of any property, planned or existing, increased?<br>• Will the policy put other assets at risk from flooding?<br>• Will the policy ensure that people and property are protected from flooding? |
| **Material Assets** | 14. To promote the sustainable use of Shetland's natural resources<br>15. To provide opportunities for sustainable waste management | • Does the plan or programme encourage the sustainable use of natural resources?<br>• Will the policy lead to a reduction in the use of natural resources?<br>• Does the policy encourage the use of local or imported materials?<br>• Will the policy encourage sustainable waste management?<br>• Will the policy promote or enable greater use of recycling? |
| **Cultural Heritage** | 16. To conserve and protect the historic environment, including buildings, archaeological sites and other culturally important features<br>17. To safeguard distinctive cultural heritage features and their settings through the responsible design and siting of development | • Does the policy impact on the historic environment?<br>• Does the policy conserve and protect the historic environment?<br>• Does the policy safeguard distinctive aspects of local cultural heritage?<br>• Will the policy affect the setting of any listed buildings, historic sites or culturally important sites? |
| **Landscape and Built Environment** | 16. To protect the special qualities and characteristics of Shetland's landscapes and seascapes<br>17. To improve those landscapes and seascapes that are degraded<br>18. To respect urban form, settlement pattern or identity<br>19. Improve the quality and design of the built environment | • Does the policy consider all landscape and seascape implications?<br>• Does the policy contribute to landscape and seascape protection?<br>• Does the policy enhance degraded landscapes and seascapes?<br>• Does the policy respect Shetland's urban forms, settlement patterns and identity?<br>• Does the policy improve the quality and design of the built environment? |

The SEA framework was used to predict the potential effects of individual interventions and the vision of the plan as a whole. Best practice guidance on evaluation was followed and the effects were considered in terms of their scale, the sensitivity of the resource, whether the effects were temporary or permanent, positive or negative, direct or indirect and whether there was the potential for effects to build up. Wherever the potential for significant environmental effects was identified the potential for mitigation was considered.

A simple scoring system was used to assess the Onshore Wind Energy SG Policies against the SEA framework, as set out in Table 2.4.

**Table 2.4 SEA Framework Scoring System**

| | |
|---|---|
| Clear contribution to the objective, very positive | √√ |
| Broadly supportive | √ |
| Neutral, no discernible effect | 0 |
| Negative effect, incompatible | x |
| Very negative effect | xx |
| Uncertain effect | ? |
| Positive and negative effects | x√ |

The findings of each assessment are set out in a matrix table based on the one in Table 2.5 and the full assessment is contained within Annex A. Each assessment is supported by text as appropriate to ensure that the summaries in the tables are auditable and the methods of assessment transparent. The text indicates where qualitative appraisal only has been possible and what information has been used to inform the findings and recommendations.

In undertaking the final appraisals of residual effects, the scale and nature of the effects was taken into account. The potential for cumulative environmental effects of the Onshore Wind Energy SG has been evaluated in the light of the evolution of the environment without the plan (see Section 4.4).

**Table2.5 Example Matrix for Documenting the Assessment of Onshore Wind Energy SG Policies**

| SG Policy | SEA Objective | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1. To further the conservation of biodiversity | 2. To improve the quality of life for people and communities across Shetland | 3. To improve the quality of health in Shetland | 4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner | 5. To protect and enhance freshwater and marine water quality | 6. To ensure that Shetland's water resources are used effectively and sustainably | 7. To protect Shetland's air quality | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO_2$ reduction target | 9 Facilitate development and use of energy generated from renewable energy technologies and contribute to meeting climate change greenhouse gas reduction | 10. To adapt to the predicted effects of climate change, such as flood risk | 11 T o reduce or manage flood risk with and from any new developments | 12. To promote the sustainable use of Shetland's natural resources | 13 To provide opportunities for sustainable waste management | 14. To conserve and protect the historic environment | 15. To conserve and promote the distinctive cultural heritage | 16. To protect the special qualities and characteristics of Shetland's landscapes and seascapes | 17. To improve those landscapes and seascapes that are degraded | 18 To respect urban form, settlement pattern or identity | 19 Improve quality and design of the built environment |
| **Policy: XXX** | | | | | | | | | | | | | | | | | | | |
| | **To cover for example:**<br>- Likelihood/certainty of effect occurring<br>- Geographical scale of effect<br>- Whether temporary or permanent<br>- Frequency of effects and potential for reversibility<br>- Assumptions made in assessment<br>- Future opportunities for mitigation<br>- Potential for indirect effects<br>- Potential for secondary effects<br>- Potential for synergistic effects<br>- Potential for cumulative effects<br>- Requirements for consultation<br>- Identification of any partners to deliver mitigation etc<br>- Any recommendations for issues to be considered at different stages of the planning process<br>- Recommendations for data collation<br>**- etc** | | | | | | | | | | | | | | | | | | |
| **Policy: XXX** | | | | | | | | | | | | | | | | | | | |

## 2.7 RESPONSE TO STATUTORY CONSULTATION

### 2.7.1 Introduction

The responses of the three statutory consultees – the Scottish Environment Protection Agency, Scottish Natural Heritage and Historic Scotland to the consultation process on the Scoping Report are summarised in Annex B. A brief summary of the responses is given below.

### 2.7.2 Historic Scotland

Some constructive comments were provided with regard to the context of the historic environment together with recommendations for the inclusion of recent changes in policy background. These have now been included. Data were provided on the number of listed buildings, gardens and designed landscapes and this information was used to update the relevant section of the environmental baseline. There were also some helpful comments with regard to the possible impact on historic sites from wind developments and the need to fully document the process of considering alternative objectives and policies. These points have been taken up and reflected in the environmental report.

### 2.7.3 Scottish Environment Protection Agency (SEPA)

Highlighted the issue of waste materials generation, specifically waste peat and overburden associated with wind developments and related to this suggested the need for inclusion of deep peat location in the baseline. The baseline was amended to reflect this comment and the point was further brought out in the assessment, signposting this information and highlighting the requirement for potential developers to take account of it. The point was made that the assessment matrix should be edited to reflect the identification of likely significant effects and then identification of mitigation methods to overcome these effects. The appraisal matrix was adjusted in accordance with this comment. The useful recommendation was made that the Environmental Report should clarify how the assessment impacted on the policies being consulted upon; this approach has been incorporated in the Environmental Report.

### 2.7.4 Scottish Natural Heritage (SNH)

Constructive comments were provided on some additional plans and programmes that should be included for review and these have now been reviewed. Various comments were made on the natural heritage present in Shetland and these have been incorporated to the environmental baseline section of the Environmental Report. SNH noted a number of inaccuracies within the tables listing the designated features of the SACs and SPAs of Shetland, these have been amended in this report. SNH also made further corrections to the tables listing protected sites (SSSIs, NNRs etc) and details of RSPB reserves. Useful comments on protected species and habitats of Shetland were made and these were incorporated into the baseline information. The relevance of a number of ‘Current Environmental Issues’ to the IPP was questioned and SNH made suggestions for additional issues that should be included so the text was edited accordingly. Finally a suggestion for a biodiversity indicator was given which has been incorporated.

# 3 PLAN CONTEXT

## 3.1 INTRODUCTION

The Shetland Islands Council Corporate Plan (2008) supported the development of a large wind farm on Shetland, which will contribute to the national target of energy generated from renewable sources, increase the local skills base, and provide a security of income in the face of a declining oil industry. The Onshore Wind Energy SG is therefore needed in order to steer wind energy development towards the most suitable locations in terms of sustainability, economic, social and environmental parameters.

This section provides a brief summary of the Onshore Wind Energy SG together with its key objectives. The links to other relevant plans, programmes and strategies (PPS) are then described setting out the main environmental objectives of these PPS and the corresponding implications for the Onshore Wind Energy SG.

## 3.2 OUTLINE AND OBJECTIVES OF THE ONSHORE WIND ENERGY SG

The Local Development Plan Policy and Development Criteria of the Onshore Wind Energy SG are listed in Tables 3.1 and 3.2below.

**Table 3.1 Local Development Plan Policy**

| | |
|---|---|
| LDP RE1 | Renewable Energy |
| Onshore Wind Energy SG | Classifying Wind Energy Developments - Development categories |
| Onshore Wind Energy SG | Spatial Framework |

**Table 3.2: Development Criteria**

| | |
|---|---|
| DC1 | Landscape and Visual Impact |
| DC2 | Cumulative Impacts |
| DC3 | Natural Heritage |
| DC4 | Impacts on Communities |
| DC5 | Water Resources |
| DC6 | Decommissioning |
| DC7 | Historic Environment |

The Policy, Spatial Framework and Development Criteria are the drivers behind the Onshore Wind Energy SG and shaped the development of the SG. The Environmental Report focuses on an assessment of these key features (see Section 5 and Annex A).

## 3.3 LINKS TO OTHER RELEVANT POLICIES, PLANS AND PROGRAMMES

An understanding of the relevance of other legislation, policy and plans to the Onshore Wind Energy SG is an essential step in understanding the context for the Onshore Wind Energy SG and in deriving the necessary baseline for the assessment. A summary list of the policies, plans and programmes together with

their environmental objectives relevant to the Onshore Wind Energy SG are presented in Table below. These were used to help shape the SEA objectives in Table 2.2.

**Table 3.3 Summary of Representative Plans, Programmes and Strategies (PPS) relevant to the Onshore Wind Energy SG**

| Policy, Plan or Programme | Summary of Relevant Environmental Objectives and corresponding implications for the Onshore Wind Energy SG |
|---|---|
| **National** | |
| The Wildlife and Countryside Act (1981) | The Wildlife and Countryside Act 1981 is the principal legislation dealing with nature conservation in Britain. The SIC Construction and Design IPP should aim to promote the maintenance and enhancement of the UK's biodiversity. |
| Environmental Protection Act 1990 | This Act relates to the control of pollution and protection of the natural environment |
| The Town and Country Planning (Scotland) Act 1997 (as amended) | Legislation to promote sustainable economic development, encourage regeneration and to maintain and enhance the quality of the natural heritage and built environment. |
| Water Environment and Water Services (Scotland) Act 2003 | Ensures that all human activity that can have a harmful impact on water is controlled |
| Nature Conservation (Scotland) Act (2004) – "the 2004 Act" | This Act puts in place legal measures for the conservation of biodiversity. The Act places a "Biodiversity Duty" on Shetland Islands Council |
| Water Environment (Controlled Activities) (Scotland) Regulations 2005 | Requires authorisation over point source discharges, abstractions, impoundments and engineering activities |
| Climate Change Act 2008 | Sets a statutory framework and targets for greenhouse gas emissions reductions for 2020 and 2050 and requires that annual targets be set and that regular reports on progress be made to UK Parliament; imposes climate change duties on public bodies; and other provisions related to adaptation, establishment of carbon budgeting, emissions trading, waste reduction, establishment of The Committee on Climate Change and related matters.<br><br>Provides a significant incentive for the development of renewable energy generation developments. |
| Climate Change (Scotland) Act 2009 | Sets a statutory framework and targets for greenhouse gas emissions reductions for 2020 and 2050 and requires that annual targets be set and that regular reports on progress be made to Scottish Ministers; imposes climate change duties on Scottish public bodies; and other provisions related to adaptation, forestry, energy efficiency, waste reduction, public engagement and carbon assessment.<br><br>Provides a significant incentive for the development of renewable energy generation developments. |
| Wildlife and Natural Environment (Scotland) Act 2011 | Provides for public bodies subject to the biodiversity duty under section 1 of the 2004 Act to prepare and publish reports on compliance with that duty |

| | |
|---|---|
| The Conservation (Natural Habitats etc.) Regulations 1994 (as amended) | 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 air quality strategy for England, Scotland, Wales and Northern Ireland (26 March 2011) | This Air Quality Strategy sets out air quality objectives and policy options to further improve air quality in the UK from today into the long term.<br><br>As well as direct benefits to public health, these options are intended to provide important benefits to quality of life and help to protect our environment. |
| Biodiversity: The UK Action Plan (1994) | The plan assesses the current status of the UK's habitats and species and sets out a strategy for their future conservation and enhancement |
| National Planning Framework for Scotland 3 (NPF3) (2014) | Sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland as a whole |
| Scottish Planning Policy: October 2014 | Sets out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development1 and use of land |
| Scottish Climate Change Delivery Plan (2009) | Sets out the high level measures required in each sector to meet Scotland's statutory climate change targets, to 2020 and in the long term |
| Scottish Biodiversity Strategy: Scotland's Biodiversity, It's in Your Hands (2004) | To conserve Scotland's biodiversity for future generations |
| 2020 Challenge for Scotland's Biodiversity: A Strategy for the Conservation and Enhancement of Biodiversity in Scotland (2013) | The 2020 Challenge for Scotland's Biodiversity is Scotland's response to the Aichi Targets set by the United Nations Convention on Biological Diversity, and the European Union's Biodiversity Strategy for 2020. It is a supplement to the Scotland's Biodiversity: It's in Your Hands (2004). The two documents together comprise the Scottish Biodiversity Strategy. |
| PAN 60: Planning for Natural Heritage | How development and the planning system can contribute to the conservation, enhancement, enjoyment and understanding of Scotland's natural environment |
| Historic Environment Scotland Policy Statement (2016) | Directs planning authorities in their consideration of applications for conservation area consent, listed building consent and their consideration of planning applications affecting the historic environment and the setting of individual elements of the historic environment |
| Our Place in Time - The Historic Environment Strategy for Scotland (2014) | Seeks to ensure that the cultural, social, environmental and economic value of Scotland's historic environment continues to make a strong contribution to the wellbeing of the nation and its people |
| PAN 1/2010 Strategic Environmental Assessment of Development Plans | Provides advice on how the requirements of the Environmental Assessment (Scotland) Act 2005 can be met within the development planning process. |

| | |
|---|---|
| PAN 1/2011: Planning and Noise | How the planning system helps to prevent and limit the adverse effects of noise. |
| PAN 2/2011 Planning Advice Note Planning and Archaeology | Provides advice to planning authorities and developers on dealing with archaeological remains |
| Onshore wind turbines (2014) | Advice for planning authorities on planning issues to consider in relation to onshore wind turbines |
| Wind farm developments on peat land: planning advice (2013) | Guidance for planning authorities on planning issues relating to wind farm developments on peat land |
| **Local and Regional** | |
| Shetland Local Development Plan (2014) | Sets out a vision and spatial strategy for the development of land in the Shetland Islands. Supplementary Guidance is formally a part of the LDP in respect of the defined subject area. |
| Shetland Islands Marine Spatial Plan (2015) | The SIMSP provides an overarching policy framework to guide marine development and activity out to 12 nautical miles. |
| Shetland Island Council Corporate Plan (2016) | Outlines Shetland Islands Council's vision, priorities and outcomes covering the period to the period 2020 |
| Shetland Community Plan (2013) | Sets out how the public, private and third sector organisations working together, and with communities, plan and deliver better services to make a real difference to people's lives. |
| Shetland Regional Transport Strategy (2008) | Sets out strategy for development of an efficient and reliable transport system for Shetland |
| Economic Development Policy Statement (2015) | Aims to improve the economic well-being of Shetland by promoting an environment in which newer industries develop alongside thriving traditional industries |
| Shetland Island Council Sustainable Development Implementation Plan (2012) | Seeks to embed sustainable development into existing community, corporate and service planning processes |
| Orkney and Shetland Area Waste Plan (2003) | Sets out a waste management strategy for Orkney and Shetland. |

# 4 ENVIRONMENTAL BASELINE

## 4.1 INTRODUCTION

Part 2, Schedule 3 of the 2005 Act requires the Environmental Report to include a description of "the relevant aspects of the current state of the environment and the likely evolution thereof without the implementation of the plan or programme."

This section of the Environmental Report describes:

- the current state of the environment in the study area and the environmental characteristics of the area likely to be significantly affected by the Onshore Wind Energy SG; and
- the existing environmental issues which are relevant to the Onshore Wind Energy SG including those relating to areas of particular environmental importance;
- the evolution of the Shetland environment without the Onshore Wind Energy SG (Table 4.19).

## 4.2 CURRENT ENVIRONMENTAL BASELINE

### 4.2.1 Biodiversity, Flora and Fauna

Many areas of Shetland are designated under international or national legislation or by the SIC. This section describes these areas and highlights their respective level of protection. Information about species which are protected under European or national legislation is also provided, together with further information on priority species and habitats.

### Designated Areas

*Special Protection Areas (SPAs)*
SPAs are protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC), also known as the Birds Directive, which came into force in April 1979. They are classified for rare and vulnerable birds, listed in Annex I of the Birds Directive, and for regularly occurring migratory species. Shetland is home to 12 SPAs and 3 proposed SPAs the full list of which is given in Table 4.1 and displayed in Figure 4.1.

**Table 4.1 Special Protection Areas in Shetland**

| Site Name |
|---|
| **Fair Isle** |
| **Fetlar** |
| **Foula** |
| **Hermaness, Saxa Vord and Valla Field** |
| **Lochs of Spiggie and Brow** |
| **Mousa** |
| **Noss** |
| **Otterswick and Graveland** |
| **Papa Stour** |

**Ramna Stacks and Gruney**
**Ronas Hill - North Roe and Tingon**
**Sumburgh Head**
**Bluemull and Colgrave Sounds proposed SPA**
**East Mainland Coast, Shetland proposed SPA**
**Seas off Foula proposed SPA**

*Source: Scottish Natural Heritage Sitelink http://gateway.snh.gov.uk/sitelink/index.jsp (accessed 26/01/2017)*

*Special Areas of Conservation (SACs)*
SACs are designated under the EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, known as the Habitats Directive. In the UK, sites are protected under The Conservation (Natural Habitats, &c.) Regulations 1994, due to the presence of one or more habitats or species listed in the Directive and management plans are written to ensure 'favourable conservation status.' The 12 SACs in Shetland are listed in Table 4.2 and displayed in Figure 4.1.

**Table 4.2 Special Areas of Conservation in Shetland**

**Site Name**
**East Mires and Lumbister**
**Fair Isle**
**Hascosay**
**Keen of Hamar**
**Mousa**
**North Fetlar**
**Papa Stour**
**Ronas Hill - North Roe**
**Sullom Voe**
**The Vadills**
**Tingon**
**Yell Sound Coast**

*Source: Scottish Natural Heritage Sitelink http://gateway.snh.gov.uk/sitelink/index.jsp (accessed 26/01/2017)*

*Annex 1 nesting birds*
The EU Birds Directive also requires steps to be taken to protect birds outwith designated sites. In particular, Article 4.4 requires Member States to strive to avoid pollution or deterioration of the habitat of species listed in Annex 1 of the Directive. The SEA should therefore consider the effects of the Onshore Wind Energy SG on the habitat of Annex 1 species outwith designated sites. The following Annex 1 species nest in Shetland:

- Red-throated diver
- Whooper swan
- Red-necked phalarope
- Leach's Petrel
- Merlin
- Common tern
- Storm petrel
- Peregrine
- Arctic tern

- Golden plover

Several other Annex 1 species occur as migrant or wintering birds. Whooper Swan occurs in significant numbers in Shetland and so pollution or deterioration of their wintering habitat should also be avoided.

*Nature Conservation Marine Protected Areas*
These areas are designated under the Marine (Scotland) Act 2010 to conserve important marine wildlife, habitats and geodiversity. The Nature Conservation MPAs in Shetland are listed are listed below in Table 4.3. Their locations are shown in Figure 4.1.

**Table 4.3 Nature Conservation Marine Protection Areas in Shetland**

**Site Name**
**Fetlar to Haroldswick**
**Mousa to Boddam**

*Demonstration and Research Marine Protected Areas*
These areas are designated by Scottish Ministers under the Marine (Scotland) Act 2010. This site was made for the purposes of both demonstration of sustainable methods of marine management or exploitation and research into such matters. The site is listed below in Table 4.4. Its location is shown in Figure 4.1.

**Table 4.4 Demonstration and Research Marine Protection Areas in Shetland**

**Site Name**
**Fair Isle**

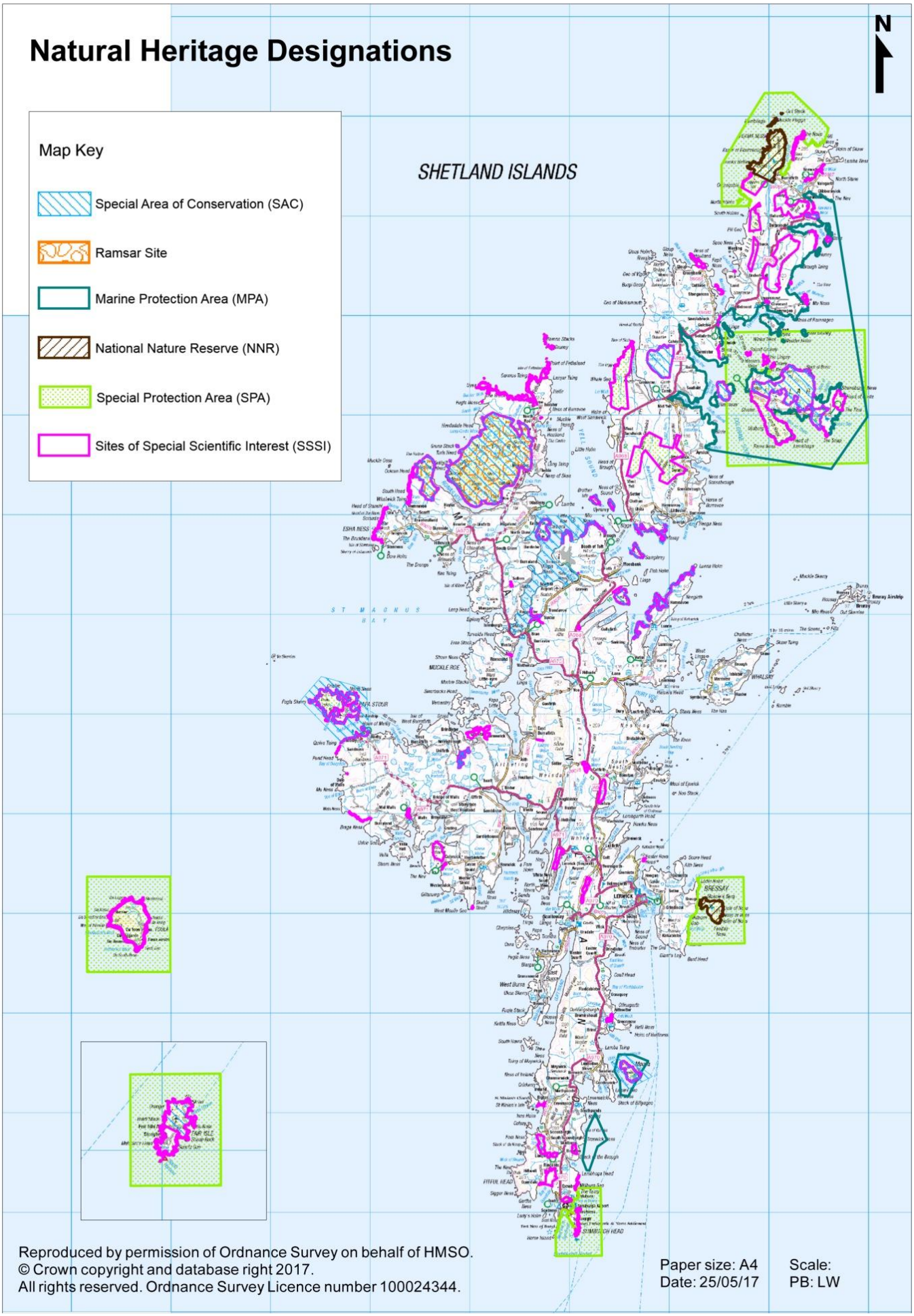
*Sites of Special Scientific Interest (SSSI)*
These areas are protected under the Wildlife and Countryside Act (1981) as amended by the Nature Conservation (Scotland) Act 2004. Sites are designated due to the presence of important flora, fauna or geographical features. Shetland has 81 sites designated for the interests listed below in Table 4.5. Some sites are designated for several reasons. SSSIs in Shetland are listed below in Table 4.5; their location is shown in Figure 4.1.

**Table 4.5 Summary of notified features for SSSIs in Shetland**

| | |
|---|---|
| Geology (31 sites) | Intertidal Habitats (6 sites) |
| Geomorphology (7 sites) | Aquatic Flora (6 sites) |
| Montane habitats (1 site) | Rare Plants (5 sites) |
| Serpentine Vegetation (4 sites) | Seabirds (9 sites) |
| Other Heather land (4 sites) | Wildfowl (3 sites) |
| Marsh and Meadow (4 sites) | Aquatic Fauna (3 sites) |
| Limestone and Grassland (1 site) | Mammals (3 sites) |
| Sand Dune Flora (2 sites) | Trees and Woodland (3 sites) |

*Source: Scottish Natural Heritage Sitelink. http://gateway.snh.gov.uk/sitelink/index.jsp (accessed 26/01/2017)*

**Figure 4.1 Natural Heritage Designations**



*Ramsar Sites*
Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. Under the Convention wetland is defined as:

> *"areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres. [wetlands] may incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands"*

One site in Shetland - Ronas Hill, North Roe and Tingon -was designated as a Ramsar site in August 1997. It is important primarily for its red-throated divers and the nationally rare Arctic water flea, *Eurycerus elacialis*.

*National Nature Reserves (NNR)*
NNRs are declared by SNH under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981. They are managed to conserve their habitats or to provide special opportunities for scientific study of the habitats, communities and species represented within them. Shetland has 2 NNRs (see Figure 4.1):

- Hermaness
- Noss

Two of Britain's largest seabird colonies can be found at Noss and Hermaness.

*Marine Consultation Areas (MCA)*
Marine Consultation Areas are identified by Scottish Natural Heritage as deserving particular distinction in respect of the quality and sensitivity of the marine environment within them. Their selection encourages coastal communities and management bodies to be aware of marine conservation issues in the area. There are four MCAs in Shetland and these are listed in Table 4.6.

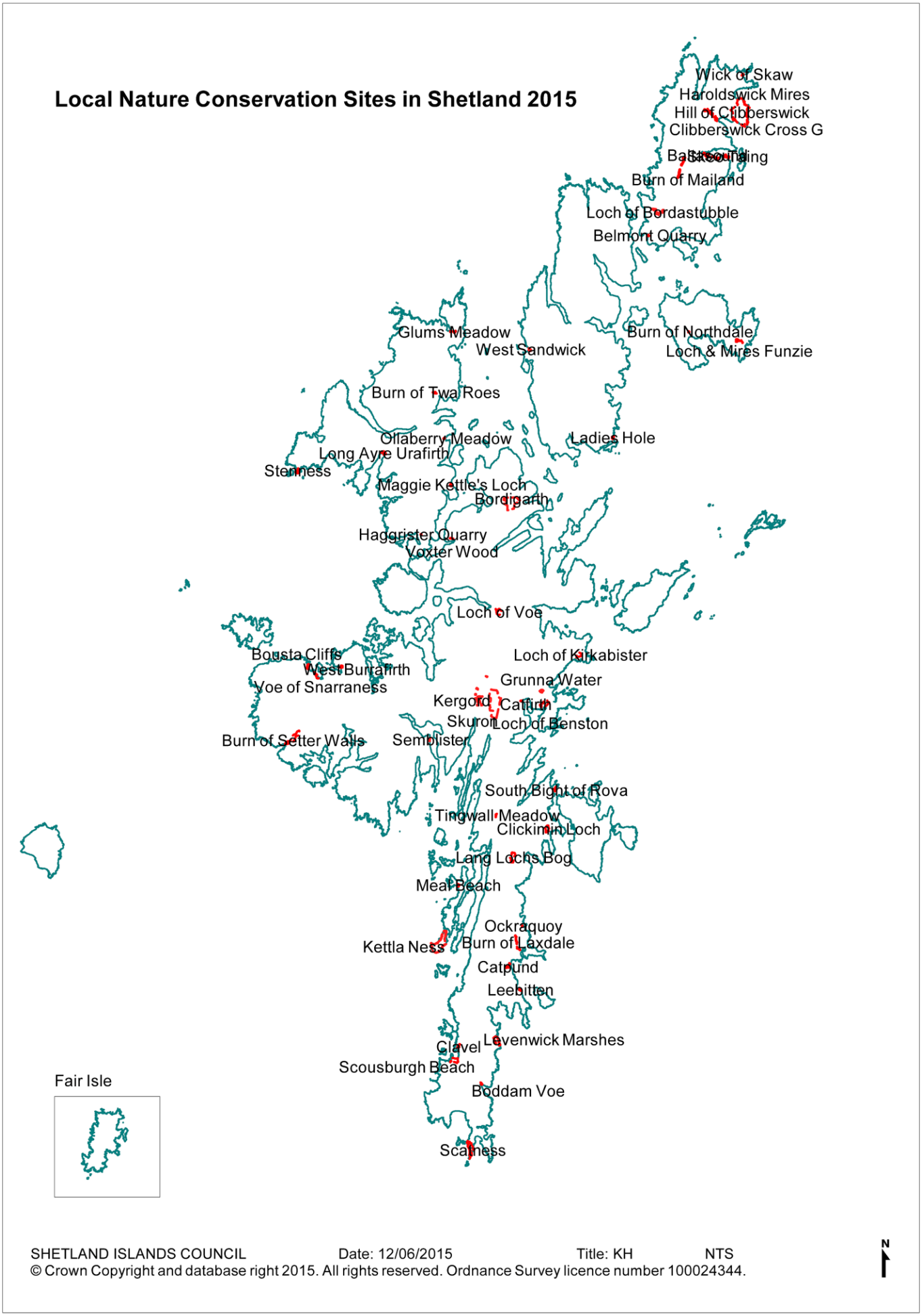
**Table 4.6 Marine Consultation Areas in Shetland**

| Site | Description |
|---|---|
| **Brindister Voe and the Vadills** | Brindister Voe includes communities representative of Shetland voes in general. The Vadills comprises the most complex and least disturbed lagoon system in Shetland, unique in the British Isles |
| **Swinister Voe and the Houb of Fora Ness** | Swinister Voe is included because of its rich lower shore fauna and flora. The Houb contains communities characteristic of shallow, submerged, extremely sheltered conditions. The gravel rapids community is probably the best such example in Shetland |
| **The Houb, Fugla Ness** | The site contains extensive areas of sediment shores, (unusual in Shetland), as well as more widespread boulder/shingle shores |
| **Whiteness Voe** | The bay at the head of the Voe is of high scientific interest because it contains the best-developed bed of eel grass in Shetland and because the rich sediments include both widely occurring and rare communities and species |

*Source: Scottish Natural Heritage Natural Spaces https://gateway.snh.gov.uk/natural-spaces/datasets/MCA (accessed 30/03/2017)*

*Local Nature Conservation Sites (LNCS)*
LNCS highlight sites with important natural heritage to developers and the Council. They provide more information to ensure that development takes into account the important and sensitive natural heritage features of these sites. There are 49 LNCS and their locations are shown on Figure 4.2.

**Figure 4.2 Local Nature Conservation Sites**



*RSPB Reserves*

There are four RSPB reserves in Shetland, which are located at:

- Sumburgh Head (NGR: HU 407 079);
- Mousa (NGR: HU 460 241);
- Fetlar (NGR: HU 619 921); and
- Loch of Spiggie (NGR: HU 371 166).

**Designated Species**

It will be important to consider the effects of any proposals on European and nationally protected species in the area. European species are given a high level of protection under Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora which is transposed into UK law by The Conservation (Natural Habitats &c) Regulations 1994. These species include otter and cetaceans, both of which occur on Shetland or its surrounding sea. Since 1980, eighteen species of cetacean have been recorded along the coast or in nearshore waters (within 60 km of the coast). Of these, eight species (29% of the UK cetacean fauna) are either present throughout the year or recorded annually as seasonal visitors, these include the humpback whale (*Megaptera novaeangliae*), minke whale (*Balaenoptera acutorostrata*), long-finned pilot whale(*Globicephala melas*), killer whale (*Orcinus orca*), Risso's dolphin (*Grampus griseus*), white-beaked dolphin (*Lagenorhynchus albirostris*), Atlantic white-sided dolphin (*Lagenorhynchus acutus*) and harbour porpoise (*Phocoena phocoena*); *source: Sea Watch Foundation (2008) Cetaceans of Shetland*. Disturbance to any of these species requires a licence from the Scottish Government and demonstration that no reasonable alternative exists and that proposals would not affect the conservation status of the species.

A number of animal and plant species are protected under the Wildlife and Countryside Act 1981 as amended by the Nature Conservation (Scotland) Act 2004. Species protected under the Wildlife and Countryside Act 1981 which occur in Shetland are as follows:

Schedule 1 (breeding birds):

- Red-throated diver
- Black-tailed godwit
- Greenshank
- Merlin
- Peregrine
- Leach's petrel
- Red-necked phalarope
- Whooper swan
- Whimbrel

Schedule 5 (other animals):

- Cetaceans
- Otter
- Freshwater pearl mussel

Schedule 8 (plants):

- *Arenaria norvegicus* (Norwegian sandwort)
- *Hieracium attenuatifolium* (Weak-leaved hawkweed)
- *Hieracium northroense* (North Roe hawkweed)
- *Hieracium zetlandicum* (Shetland Hawkweed)
- *Hamatocaulis (Drepanocladus) vernicosus* (Slender green feather-moss)

Although not all of these species occur across Shetland, some, such as otter have been recorded on a regular basis.

**Priority Habitats and Species**

The Nature Conservation (Scotland) Act 2004 places an obligation on all public bodies to further the conservation of biodiversity, particularly in respect of habitats and species listed in the Scottish Biodiversity List (SBS) - Biodiversity Scotland (2009), available at: http://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL. The SBS is a list of flora, fauna and habitats considered by the Scottish Ministers to be of principal importance for biodiversity conservation. The list includes many species and habitats, both terrestrial and marine, which occur in Shetland.

As part of the Living Shetland draft Local Biodiversity Action Plan, priority habitats and species were identified. Priority habitats include roadside verges, machair, herb-rich meadows, wet meadows and arable crops. In some cases, habitat action plans have been developed. Table 4.6 lists the priority species for which specific action plans were developed.

**Table 4.6 Species Action Plans in Shetland**

| List of Species Action Plans in Shetland | |
|---|---|
| Arable weeds | Bumblebees |
| Harbour porpoise | Oysterplant |
| Skylark | Arctic char |
| Breeding waders | Red necked phalarope |
| Merlin | Farmlands birds |
| Hawkweeds | Red-throated diver |
| Eider | |

*Source: Living Shetland: Action for Shetland's Biodiversity (2004) Shetland Local Biodiversity Action Plan*

The presence of some species in Shetland is highly significant in a national context, for example 90% of the UK population of the red-necked phalarope is present in Shetland. Similarly, Shetland is home to approximately 90% of the UK's whimbrel population. Coastal cliffs provide important nesting sites for breeding seabirds. Shetland is home to one tenth of the total seabird population of Britain; in excess of one million birds from 22 species. The varied coastline of Shetland supports diverse habitats and species. Voes (inlets/sea lochs) provide shelter and muddy conditions exist at the heads of some of the longer voes, which are inhabited by species such as cockles and lugworms. In deep water, reefs are formed from large horse mussels. Sandeels, which are an important food source for Shetland's many seabirds, mammals, and commercial fish stocks are supported by finite offshore supplies of sand.

### 4.2.2 Population and Human Health

**Background**

Shetland's population has been generally rising since the 1970s, though it declined during parts of the 1990s and 2000s; though from 1991 to 2011 it rose by 3%. However, this masks significant differences between localities; for example, the North Isles (Yell, Unst and Fetlar) saw their population decline 25% over the same period, whilst the Central Mainland's population rose by 20% over the same period and the South Mainland increased by 22%

There was previously (1961-1981) a strong trend towards centralisation of the population towards Lerwick, however between 1991 and 2011 the population of Lerwick and Bressay declined 5% and around 32 percent of the population now lives in Lerwick and Bressay.

Since 1971, Shetland's population aged over 65 has risen by 39 percent, however, whilst the proportion of the population over 65 has only risen from 17% to 18% over that period, the proportion over 85 has risen from 1% to 3%.
*Source: Shetland in Statistics 2003 & 2014, Shetland Islands Council 2003 & 2014*

**Accessibility and Social Exclusion**

A recent report by the SIC (Deprivation and Social Exclusion in Shetland, Shetland Islands Council, 2006) found that a section of the Shetland community, namely those without easy access to private car use, have difficulty in accessing certain services and opportunities. This affects peoples' opportunity to access employment, education, social events and to purchase healthy food at a reasonable cost. This is a particular problem for those in outlying communities or those with mobility problems.

**Health and Healthy Lifestyles**

The following data (Tables 4.7, 4.8, & 4.9) provide an overview of the proportions of people who are in good and poor health. When viewing these figures, it is important to take into account that the population is declining and aging.

**Table 4.7 Health Statistics for Shetland**

| Health Issues | Statistics for Shetland |
|---|---|
| 1. Average age of a person with good or very good health | 36.7 |
| 2. Average age of a person with a limiting long term illness | 59.6 |
| 3. Percentage of economically inactive people who are permanently sick/disabled | 13.5 |
| 4. Percentage of households with one or more carers resident | 15.3 |
| 5. General health - % Very Good<br>% Good<br>% Fair<br>% Bad<br>% Very Bad | 54.6<br>31.0<br>10.9<br>2.6<br>0.8 |
| 6. Percentage of population long-term health problem or disability | 17.3 |
| 7. Percentage of population that does not have a long-term health problem or disability | 82.7 |
| 8. Life Expectancy at birth (2013-15) | Male: 77.6<br>Female: 81.9 |

*1-7. Source: 2011 Census Results*
*8. Source: National Records of Scotland (NRS)*

**Table 4.8 All Heart Diseases Standardised Mortality Rate Per 100,000 Population <75**

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shetland** | 70.6 | 109.3 | 63.3 | 29.0 | 51.3 | 81.2 | 63.0 | 83.5 | 61.5 | 92.9 |

*Source: ISD Scottish Heart Disease Statistics Stats Report*

**Table 4.9 Stroke/Cerebrovascular Disease Standardised Mortality Rate Per 100,000 Population <75**

| Year | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Shetland** | 6.5 | 16.8 | 15.7 | 17.4 | 40.0 | 16.3 | 10.2 | 19.7 | 27.1 | 19.1 |

*Due to the small numbers involved, these figures should be interpreted with caution.
*Source: ISD Scottish Stroke Statistics Stats Report*

## Employment

Table 4.10 shows the breakdown of employment by occupation in Shetland by Occupational Classification.

**Table 4.10 Employment by occupation in Shetland (Jan 2016-Dec 2016)**

| Standard Occupational Classification | Numbers | % |
|---|---|---|
| SOC 2010 Major Group 1-3 | 4600 | 36% |
| 1 Managers, Directors & Senior Officials | # | # |
| 1 Professional Occupations | 1800 | 14% |
| 1 Managers, Directors & Senior Officials | 1900 | 14% |
| SOC 2010 Major Group 4-5 | 3100 | 24% |
| 4 Administrative & Secretarial | 1500 | 12% |
| 5 Skilled Trades Occupations | 1600 | 12% |
| SOC 2010 Major Group 6-7 | 2300 | 17% |
| 6 Caring, Leisure & Other Service Occupations | 1600 | 12% |
| 7 Sales & Customer Service Occupations | # | # |
| SOC 2010 Major Group 8-9 | 2300 | 23% |
| 8 Process Plant & Machine Operatives | # | # |
| 9 Elementary Occupations | 1900 | 15% |

*Source: ONS annual population survey, 2017*
# Sample size too small for reliable estimates
Notes: Numbers and % are for those of 16+
% is a proportion of all persons in employment

### 4.2.3 Soils and Geology

**Soils and Geology**

The majority of the rocks of Shetland are part of an old, deeply eroded mountain chain called the Caledonian Orogenic Belt which was raised up as a mountain block between 400 and 600 million years ago. This same mountain chain forms most of Norway, Scotland and Northern Ireland. In the south-eastern and western parts of Shetland, these rocks have been overlain by sedimentary rocks of old sandstone age. These rocks were laid down and folded during the Devonian era around 400 million years ago. Running north-south through Shetland are several tear faults where blocks of rock have been displaced by movements of the earth's crust. The principal fault of this type is the Walls Boundary fault. This fault is thought to be the northern extension of the Great Glen fault found on mainland Scotland.

Metamorphic schist and gneiss extends from Fitful Head and the Clift Hills of south Mainland, through central Mainland and the coastal portion of north Mainland, east to the islands of Whalsay and Out Skerries and north to the island of Yell and the western parts of Fetlar and Unst. In central Mainland, the metamorphosed-siliceous sedimentary rocks are interspersed with bands of crystalline metamorphosed limestone which have been eroded to form a series of valleys. Superficial deposits of glacial drift, boulder clay and alluvium overlie bedrock in places, particularly on low lying areas, and the higher ground is commonly blanketed with peat. The eastern parts of Unst and Fetlar are characterised by serpentine and gabbro bedrock with a surface layer of shattered rock and glacial drift.

Much of the north Mainland, west of the Walls Boundary fault (from Ronas Hill and the North Roe plateau to the island of Muckle Roe), consists of red granite and other igneous rocks. These rocks are overlain with superficial deposits of peat, boulder clay and glacial drifts. The cliffs of Eshaness and the island of Papa Stour are formed by lavas and tuffs (volcanic ash) of old red sandstone age. The West Mainland is characterised by folded sandstone of old red sandstone age, with granite in the extreme south. The area is overlain by peat and areas of boulder clay. The south eastern coastal strip of mainland (from Sumburgh Head northwards to Lerwick), and the adjacent islands of Bressay, Mousa and Noss are formed of gently inclined sandstones, flagstones and conglomerates of old red sandstone age. In places the sandstone is interbedded with limestone and mudstone. These rocks are overlain by significant areas of boulder clay and other glacial drifts. The outlying islands of Fair Isle and Foula are formed predominantly of sandstone.

Shetland is a UNESCO European Geopark, using its exceptional geological heritage to promote sustainable development, particularly in the field of tourism and education. Shetland's earth heritage is therefore potentially of economic importance as well as academic interest. Inappropriate development can be damaging to earth heritage if it destroys or obscures geological features, however if development is appropriate and sympathetic to its surroundings it can also be beneficial in restoring those sites that have been damaged in the past.

## Peat

The Soil Survey of Scotland 1:250000 Soil Map provides information on generic soil types for the islands and this, accompanied by local knowledge, could be used to identify areas where deep peat and overburden are likely to be encountered (and from a plan-making view-point these areas should be avoided). Detailed information on peat can be found by reviewing current aerial photography and the various sources listed in Bruneau, P.M.C & Johnson, S.M. 2014, Scotland's peatland - definitions & information resources. Scottish Natural Heritage Commissioned Report No 701. Also, the Carbon and Peatland Map should be consulted – see: http://www.snh.gov.uk/planning-and-development/advice-for-planners-and-developers/soils-and-development/cpp/ and http://map.environment.gov.scot/Soil_maps/?layer=10#

## Vegetation

Shetland's vegetation is dominated by peatland, heather moorland and montane habitats. Improved rough grassland is concentrated along the coast, around the voes and in the valleys. The best agricultural land available in Shetland, improved grassland and good rough grassland, can be found in the valleys of the central Mainland; along the south and east coasts of the southern Mainland; in eastern regions of Unst and Fetlar; and along the Walls boundary fault. These are the areas of greatest agricultural production.

Shetland's flora is impoverished in comparison to that of mainland Britain. This is largely due to the climate and the islands' isolation. Shetland has the highest average humidity in Britain. This, combined with its salt-laden atmosphere, limits the botanical diversity and the scope for crop growing in the Islands.

Shetland is predominantly treeless. There is plantation woodland at Kergord in the Weisdale valley and small patches of trees are scattered throughout Shetland in various sheltered locations. Although these are the most visible trees in Shetland, they are mainly non-native species. There is a large number of remaining native trees, particularly in the north, west and central Mainland which are of greater ecological importance. These are generally small and occur singly or occasionally in small groups, often in exposed situations, on cliff ledges, in ravines and on holms in lochs which are inaccessible to grazing animals.

## Agricultural Land

**Table 4.11 Agricultural Land Use in Shetland**

| **Agriculture - Main and Minor Holdings** | **2013** |
|---|---|
| **Land Use** (ha): | |
| Tillage | 272 |
| Grassland and Crops | 27,459 |
| Rough/Common Grazing | 120,845 |
| Total Area Rented | 42,160 |
| Total Area Owned | 39,410 |
| No of Holdings | 2,030 |
| No of Common Grazings | 161 |
| **Area Under Crops** (ha): | |

| | |
|---|---|
| Grass (excl Rough Grazings) | 27,186 |
| Barley and Oats | 97 |
| Turnips and Swedes | 10 |
| Kale and Cabbage | 7 |
| Potatoes | 21 |
| All Other Crops | 107 |
| **Livestock**: | |
| Beef Cows and Heifers | 1,588 |
| Dairy Cows and Heifers | 333 |
| Total Cattle | 4,700 |
| Breeding Ewes and Gimmers | 154,204 |
| Total Sheep | 285,075 |
| Pigs | 144 |
| Poultry | 5,681 |
| Registered Slaughterhouses | 1 |
| Wool Production (est kg) | n/a |
| **Imports** | |
| Cattle | 95 |
| Horses | 64 |
| Pigs | 79 |
| Sheep | 354 |
| **Exports** | |
| Cattle | 1,470 |
| Horse | 146 |
| Pigs | 1 |
| Sheep | 87,131 |
| **Milk:** | |
| Dairy Units | 4 |
| Milk Production (litres) | 1,935,122 |
| **Employment:** | |
| F/T and P/T Employees | 272 |
| F/T and P/T Occupiers | 396 |
| Others (including occupiers less than half time, wives/husbands of occupiers and casual/seasonal labour) | 1,408 |

*Source: Shetland in Statistics 2014, Shetland Islands Council 2014*
*Estimated

### 4.2.4 Water

**Surface Water Quality**

The Scottish Environment Protection Agency (SEPA) monitors surface water quality in watercourses, estuaries and other water bodies. In addition, under the Water Framework Directive, enacted in Scotland in the Water Environment and Water Services (Scotland) Act 2003, SEPA has responsibilities relating the management and protection of river catchments (river basin districts), which includes the groundwater resource within those catchments.

For Scotland's river basin management plans (which can be found at http://www.sepa.org.uk/environment/water/river-basin-management-planning/), SEPA classifies the overall condition of the water environment by assessing water quality, ecology, physical condition, flows and levels, access for migratory fish and whether Invasive Non-Native Species (INNS) are present. Water bodies can be classified as being at high, good, moderate, poor or bad status.

Within Shetland, SEPA carries out a range of monitoring of surface and coastal waters. An overview of data is shown in Figure 4.3 below, with further information available on the Water Environment Hub at http://www.sepa.org.uk/data-visualisation/water-environment-hub/ and Scotland's Environment Web (http://www.environment.scotland.gov.uk/get-interactive/data/water-body-classification/).

**Figure 4.3 Overall condition of Shetland surface waters (2014 classification)**

**Figure 4.4 Overall condition of Shetland surface waters – number of surface waters (2014 classification)**

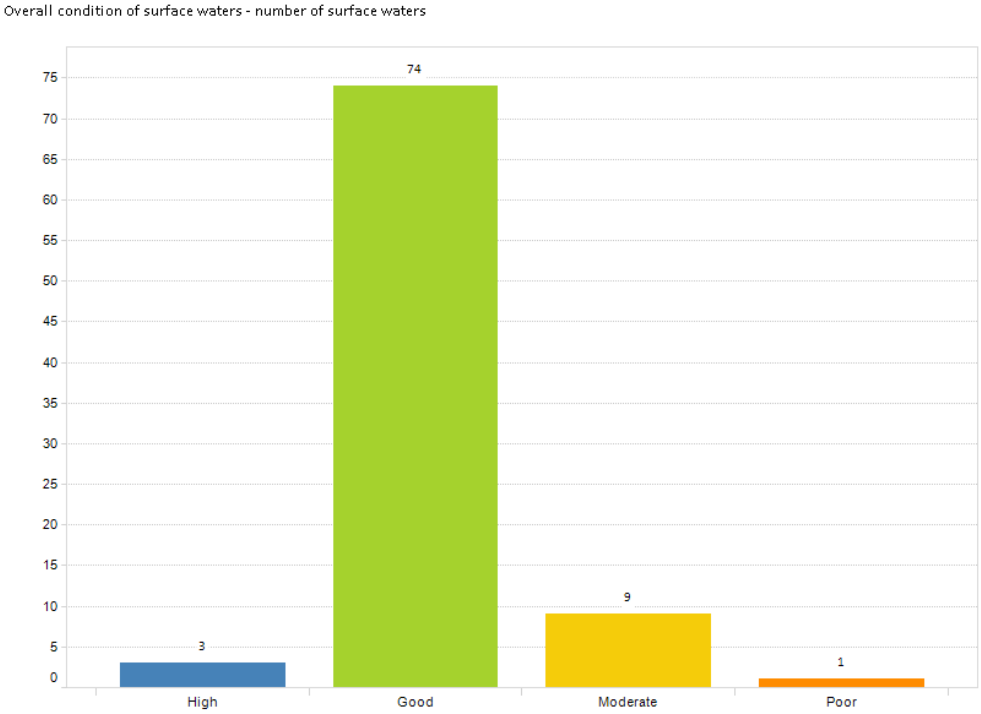



**Table 4.12 Condition of Shetland water bodies (2014)**

| Name | Condition |
|---|---|
| Burn of Burrafirth | Good |
| Burn of Mailand / Burn of Caldback | Good |
| Easter Burn of Bouster | Moderate |
| Burn of Arisdale | Moderate |
| Burn of Roerwater | Moderate |
| Burn of Laxobigging | Poor |
| Laxo Burn / Gossawater Burn | Good |
| Burn of Grunnafirth / Burn of Forse | Good |
| Burn of Strand / Burn of Griesta | Moderate |
| Burn of Dale | Moderate |
| Burn of Laxdale / Burn of Voxter | Moderate |
| Burn of Hillwell - d/s Loch of Spiggie | Moderate |
| Burn of Hillwell - u/s Loch of Spiggie | Moderate |
| Stromfirth Burn | Good |
| Burn of Weisdale | Good |
| South Burn of Burrafirth | Good |
| Gibbie Law s Burn | Good |
| Loch of Cliff | Good |
| Eela Water | High |
| Loch of Vaara | High |
| Loch of Girlsta | High |
| Loch of Spiggie | Moderate |

| | |
|---|---|
| Fair Isle | Good |
| Bressay Sound | Good |
| Vaila Sound | Good |
| Whiteness Voe | Good |
| Foula | Good |
| Dales Voe (South Mainland) | Good |
| Stromness Voe | Good |
| Lax Firth | Good |
| Loch of Hellister. Mainland. Shetland Islands | Good |
| Loch of Strom. Mainland. Shetland Islands | Good |
| Wadbister Voe | Good |
| Isle of Noss to Sumburgh Head | Good |
| Gruting Voe | Good |
| Weisdale Voe | Good |
| Sandsound Voe | Good |
| Cat Firth | Good |
| Skelda Ness to Pund Head | Good |
| The Vadills. Mainland. Shetland Islands | Good |
| The Keen to Isle of Noss | Good |
| Vementry Sound and Brindister Voe | Good |
| Aith Voe | Good |
| Laxo Voe Lagoon. Mainland. Shetland Islands | Good |
| Dury Voe | Good |
| Swarbacks Minn | Good |
| Olna Firth | Good |
| Saltness Lagoon. Mainland. Shetland Islands | Good |
| Busta Voe | Good |
| Minn. Mainland. Shetland Islands | Good |
| Vidlin Voe | Good |
| Swining Voe | Good |
| Colla Firth | Good |
| Dales Voe (North Mainland) | Good |
| The Houb. Fora Ness. Mainland. Shetland Islands | Good |
| The Houb. Fugla Ness. Mainland. Shetland Islands | Good |
| Pund Head to Esha Ness | Good |
| Ura Firth | Good |
| Sullom Voe | Good |
| Heoga Ness to The Keen | Good |
| Ness of Galtagarth. Yell. Shetland Islands | Good |
| Loch of Queyfirth. Mainland. Shetland Islands | Good |
| Ronas Voe | Good |
| Mid Yell Voe | Good |
| Whale Firth | Good |
| Basta Voe | Good |
| Bluemull Sound and West Fetlar | Good |

| | |
|---|---|
| Esha Ness to Gloup Holm | Good |
| Balta Sound | Good |
| Burra Firth | Good |
| Gloup Holm to Herma Ness | Good |
| Herma Ness to Heoga Ness | Good |
| Easter Loch. Unst. Shetland Islands | Good |
| South Wick of Sound Lagoons. Yell. Shetland Islands | Good |
| South Wick of Sound Lagoons. Yell. Shetland Islands | Good |
| Mussel Loch. Yell. Shetland Islands | Good |
| Houb at Gutcher.Yell. Shetland Islands | Good |
| Wick of North Garth Lagoon. Yell. Shetland Islands | Good |
| Loch of the North Haa. Mainland. Shetland Islands | Good |
| Houb of Haggrister. Mainland. Shetland Islands | Good |
| Vadill of Garth Lagoon. Mainland. Shetland Islands | Good |
| Clift Sound | Good |
| West Voe | Good |
| Scalloway | Good |
| Yell Sound | Good |
| Sumburgh Head to Kettla Ness | Good |
| Burwick Bay | Good |
| Burn of Burrafirth | Good |
| Burn of Mailand / Burn of Caldback | Good |
| Easter Burn of Bouster | Moderate |
| Burn of Arisdale | Moderate |
| Burn of Roerwater | Moderate |
| Burn of Laxobigging | Poor |
| Laxo Burn / Gossawater Burn | Good |
| Burn of Grunnafirth / Burn of Forse | Good |
| Burn of Strand / Burn of Griesta | Moderate |
| Burn of Dale | Moderate |
| Burn of Laxdale / Burn of Voxter | Moderate |
| Burn of Hillwell - d/s Loch of Spiggie | Moderate |
| Burn of Hillwell - u/s Loch of Spiggie | Moderate |
| Stromfirth Burn | Good |
| Burn of Weisdale | Good |
| South Burn of Burrafirth | Good |
| Gibbie Law s Burn | Good |
| Loch of Cliff | Good |
| Eela Water | High |
| Loch of Vaara | High |
| Loch of Girlsta | High |
| Loch of Spiggie | Moderate |
| Fair Isle | Good |
| Bressay Sound | Good |
| Vaila Sound | Good |

| | |
|---|---|
| Whiteness Voe | Good |
| Foula | Good |
| Dales Voe (South Mainland) | Good |
| Stromness Voe | Good |
| Lax Firth | Good |
| Loch of Hellister. Mainland. Shetland Islands | Good |
| Loch of Strom. Mainland. Shetland Islands | Good |
| Wadbister Voe | Good |
| Isle of Noss to Sumburgh Head | Good |
| Gruting Voe | Good |
| Weisdale Voe | Good |
| Sandsound Voe | Good |
| Cat Firth | Good |
| Skelda Ness to Pund Head | Good |
| The Vadills. Mainland. Shetland Islands | Good |
| The Keen to Isle of Noss | Good |
| Vementry Sound and Brindister Voe | Good |
| Aith Voe | Good |
| Laxo Voe Lagoon. Mainland. Shetland Islands | Good |
| Dury Voe | Good |
| Swarbacks Minn | Good |
| Olna Firth | Good |
| Saltness Lagoon. Mainland. Shetland Islands | Good |
| Busta Voe | Good |
| Minn. Mainland. Shetland Islands | Good |
| Vidlin Voe | Good |
| Swining Voe | Good |
| Colla Firth | Good |
| Dales Voe (North Mainland) | Good |
| The Houb. Fora Ness. Mainland. Shetland Islands | Good |
| The Houb. Fugla Ness. Mainland. Shetland Islands | Good |
| Pund Head to Esha Ness | Good |
| Ura Firth | Good |
| Sullom Voe | Good |
| Heoga Ness to The Keen | Good |
| Ness of Galtagarth. Yell. Shetland Islands | Good |
| Loch of Queyfirth. Mainland. Shetland Islands | Good |
| Ronas Voe | Good |
| Mid Yell Voe | Good |
| Whale Firth | Good |
| Basta Voe | Good |
| Bluemull Sound and West Fetlar | Good |
| Esha Ness to Gloup Holm | Good |
| Balta Sound | Good |
| Burra Firth | Good |

| | |
|---|---|
| Gloup Holm to Herma Ness | Good |
| Herma Ness to Heoga Ness | Good |
| Easter Loch. Unst. Shetland Islands | Good |
| South Wick of Sound Lagoons. Yell. Shetland Islands | Good |
| South Wick of Sound Lagoons. Yell. Shetland Islands | Good |
| Mussel Loch. Yell. Shetland Islands | Good |
| Houb at Gutcher.Yell. Shetland Islands | Good |
| Wick of North Garth Lagoon. Yell. Shetland Islands | Good |
| Loch of the North Haa. Mainland. Shetland Islands | Good |
| Houb of Haggrister. Mainland. Shetland Islands | Good |
| Vadill of Garth Lagoon. Mainland. Shetland Islands | Good |
| Clift Sound | Good |
| West Voe | Good |
| Scalloway | Good |
| Yell Sound | Good |
| Sumburgh Head to Kettla Ness | Good |
| Burwick Bay | Good |

*Source: Eilidh Johnston, River Basin Planning Co-ordinator, SEPA, Pers Comm 5/6/2017*

## The Public Water Supply

The public water supply is extracted from 18 lochs and burns (See Table 4.13) and piped to one of 10 treatment works. In addition, seven water supply zones have a total of 17 service reservoirs. Table 4.14 gives details of the treatment works and their use.

**Table 4.13 Water Sources in Shetland**

| Water Treatment Works | Waterbodies Used as Sources | Water available per day (Ml/d) |
|---|---|---|
| FETLAR WTW | Skutes Water | 0.082 |
| FOULA WTW | Shetland Foula Springs | 0.02 |
| | Springs Burn, Foula | |
| PAPA STOUR WTW | Gorda Water | 0.045 |
| SANDY LOCH WTW | Sandy Loch (Shetland) | 7.639 |
| | Loch of Brindister | |
| SKERRIES WTW | Skerries Boreholes | 0.028 |
| | Skerries Gathering Area | |
| YELL WTW | Gossa Water | 1.1 |
| EELA WATER WTW | Eela Water | 7.5 |
| | Moshella Loch | |
| | Roer Water | |
| UNST WTW | Helliers Water | 0.85 |
| | Loch Of Watlee | |
| WHALSAY WTW | Huxter Loch | 0.75 |
| | Bu Water | |
| FAIR ISLE WTW | Fairisle Borehole | 0.042 |

M lpd - million litres per day

*Source: Susanne Stevenson, Development Planner, Scottish Water, Pers Comm 19/6/2017*

**Table 4.14 Water Treatment and Usage in Shetland**

| Water Treatment Works | Population Served | Average Water Consumption (M lpd) | Average Daily Demand as % of Capacity |
|---|---|---|---|
| Papa Stour | 36 | 0.004 | 26.7% |
| Eela Water | 5,591 | 4.173 | 97.7% |
| Sandy Loch | 14,065 | 6.771 | 107.5% |
| Skerries | 77 | 0.007 | 28.6% |
| Fair Isle | 72 | 0.014 | 48.1% |
| Yell | 1,069 | 0.640 | 106.7% |
| Unst | 799 | 0.372 | 62.0% |
| Foula | 60 | 0.010 | 48.8% |
| Fetlar | 130 | 0.038 | 63.7% |
| Whalsay | 849 | 0.262 | 65.6% |

*Source: Susanne Stevenson, Development Planner, Scottish Water, Pers Comm 19/6/2017*

### Flooding and Surface Run-Off

The most common cause of historical flooding events in Shetland has been inundation by the sea. However, the trend has shifted in recent times and heavy rainfall is now the cause of the majority of incidents. Burns in Shetland tend to be short and steep, which can increase flood risk during heavy rainfall. This is likely to be exacerbated by climate change in the future, as predictions for Shetland are for warmer and drier summers, warmer and wetter winters with less snow, and more extreme temperature and rainfall. The predicted increase in rainfall and river flows may increase the potential for river flooding (Flood Risk Management Strategy Shetland, SEPA, 2015).

### Vulnerability to the Effects of Climate Change

The UK Climate Projections (UKCP09) are interpreted for Shetland in the Flood Risk Management Strategy Shetland (SEPA, 2015) and they predict that climate change may lead to warmer and drier summers, warmer and wetter winters with less snow, and more extreme temperature and rainfall. The predicted increase in rainfall and river flows may increase the potential for river flooding.

Under the UKCP09 high emissions scenario for 2080, average peak river flows for Shetland may increase by 41%. Under these conditions it is estimated that the number of residential and non-residential properties at risk of river flooding does not change significantly.

UKCP09 also predicts that climate change may increase sea levels. The magnitude of sea level rise varies around the coastline.

For the UKCP09 high emissions scenario, the predicted average sea level increase for Shetland is 0.6m by 2080. This may increase the number of residential properties at risk of coastal flooding from approximately 30 to 50 and the number of non-residential from approximately 30 to 50. Coastal flood modelling by SEPA has not taken into account the impacts of a future climate on wave overtopping or storminess, which could increase the number of people affected by coastal flooding.

The predicted increases in flood risk are solely based on the impact of a changing climate on the magnitude of flooding; they do not take into account any potential

increase due to population change, development pressures or urban creep, nor do they take into account any mitigation as a result of actions contained in this or future Flood Risk Management Strategies.

For surface water, the modelling undertaken considered climate change scenarios with a 20% increase in rainfall intensity.

Under these conditions it is estimated that the number of residential and non-residential properties at risk of surface water flooding does not change significantly.

**Fishing and Aquaculture Industries**
In 2015, a total of 70,483 tonnes of wet fish was landed in Shetland (Source: NAFC Shetland Fisheries Statistics 2015). The fish catching sector lands a wide range of species into Shetland ports including:

- pelagic fishery – mackerel, herring, blue whiting;
- white fishery – haddock, cod, monkfish, megrim; and
- inshore fishery – scallops, crabs, lobsters, queens.

Fish farms occupy many of the suitable voes around Shetland. Salmon and mussels are the most commonly farmed seafood species in Shetland. The Shetland salmon industry produced an estimated 46,000 tonnes of salmon in 2015 which represents 25% of total Scottish production (Source: Scottish Fish Farm Production Survey 2015) Shetland produced 5,565 tonnes of mussels in 2015 which is 77% of the total production of Scottish mussels (Source: Scottish Fish Farm Production Survey 2015).

**Marine Pollution**
Marine pollution arises from various different sources including domestic sewage, industrial waste, naturally occurring nutrients and ballast discharged offshore by oil tankers and is also possible as a result of shipping accidents. Other forms of pollution are those caused by noise and light; these are especially relevant in terms of aquaculture. Eutrophication, the enrichment of water, is the consequence of high levels of pollution from too many sewage outfalls and badly positioned septic tanks.

### 4.2.5 Air Quality

**Background**
The Local Air Quality Management (LAQM) process set out in the Environment Act (1995) requires local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the Air Quality Objectives for Scotland.

**Air Quality Management in Shetland**
The SIC currently does not have any AQMAs. The SIC does not have a published air quality strategy document as past evidence indicates no exceedences exist within the local authority area. This situation may be reviewed in the future.

The SIC has taken forward a number of measures during the current reporting year of 2016 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in the 2016 Air Quality Annual Progress Report (APR) for Shetland Islands Council, 2016. Key completed measures are:

- Introduction of island wide Electric Vehicle (EV) Charging points, to encourage the uptake and use of EVs within the island group to reduce target emissions within the island group.
- Council investment in EV vehicles, both for pool transport and commercial uses to reduce target emissions.
- Replacement of lighting systems within council buildings to reduce consumption of oil fired generated electricity.

**Air Quality Monitoring in Shetland**

The SIC does not undertake any automatic (continuous) monitoring within the authority's area. This is due to past monitoring results indicating that concentrations were all below the national objectives, thus negating the need for further monitoring.

The SIC does not undertake any non-automatic (passive) monitoring of individual pollutants within the authority's area. This is due to past monitoring results indicated that concentrations were all below the national objectives, thus negating the need for further monitoring.

*Source: 2016 Air Quality Annual Progress Report (APR) for Shetland Islands Council, 2016*

### 4.2.6 Climatic Factors

The UK Government is a signatory to the 2015 Paris Agreement, a legally-binding framework to tackle climate change under the UN Framework Convention on Climate Change. As a result, it is committed to the global warming goal of well below 2°C on pre-industrial averages.

Following this agreement the UK Government committed to reducing carbon emissions 57% by 2030 on 1990 levels; it already had a commitment to reduce emissions of 6 greenhouse gases by 80% by 2050, introduced in the Climate Change Act 2008. The Climate Change (Scotland) Act 2009 introduced a statutory target to reduce Scotland's greenhouse gas emissions by at least 80% by 2050. That Act also set an interim target that to reduce the net Scottish CO2 emissions by at least 42% lower than the baseline by 2020.

### 4.2.7 Material Assets Background

The Scottish Government no longer has a discrete sustainable development strategy, preferring to embed the concept into its overall purpose, which is to focus government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth. The Planning etc. (Scotland) Act 2006 places a duty on planning authorities to contribute to sustainable development. SPP highlights the need to incorporate sustainable development and the tackling of climate change into the development plan process.

**Minerals**

Quarrying, minerals and aggregates data is poorly recorded in Shetland, with few data being made available, largely for reasons of commercial confidentiality surrounding relatively small operations and the significant variability over time due

to the nature of the various construction related industries and activities. The only data available at the time of this update is contained within Scottish and UK Government publications.

SPP promotes a landbank approach to planning for the supply of construction aggregates. This approach is intended to ensure that a stock of reserves, with planning permission, is maintained to ensure adequate supplies of construction aggregates over a minimum 10 year period based on current production levels. The 10 year period recognises the likely timescale between an operator deciding that there is a need for a new site, securing planning permission and bringing the site into full production.

For planning purposes SPP confirms the Scottish Government's view that LDPs should support the maintenance of a landbank of permitted reserves equivalent to a minimum 10 years extraction at all times for all market areas.

According to the 2012 Scottish Aggregates Survey (SAS) in the Orkney & Shetland Islands Region there are 3 hard rock and 0 sand and gravel quarries. Production is shown as 142,000 tonnes for hard rock all retained in the region, with 0 tonnes for imports. For sand and gravel the figures are 0 tonnes for production and 0 tonnes for imports. No other figures for Shetland are presently available.

For Estimated Consented Reserves, SAS gives the figure of 1,759,000 tonnes, implying that these are generally sufficient to meet local demand within the Orkney & Shetland Islands Region, though the equivalent figure for sand and gravel is 0 tonnes, implying no ability to meet local demand. However, all these figures should be treated with caution for at least 3 reasons, firstly they only show data for the "Orkney & Shetland Islands Region" and it is not possible to extract data for Shetland alone. Secondly, these data are now more than 5 years old and there has been considerable construction activity in Shetland over the intervening period. Thirdly, rates of return from operators to SAS are unknown and it has so far not been possible to collect comprehensive data as part of local monitoring exercises undertaken by the SIC.

Mineral extraction in Great Britain 2012, Department for Communities and Local Government Business Monitor PA1007, provides additional minerals production data specifically for Shetland:

- 1,000 tonnes of sand and an unspecified amount of other sand and gravel for fill
- Unspecified amounts of sandstone for building stone, roadstone, armour stone and gabion
- 227,000 tones of igneous rock for roadstone and other purposes
- 3,000 cubic metres of peat
- Unspecified amounts of Soapstone & Talc

**Waste Management**

There are limitations to imposing waste minimisation and use of recycled resources given Shetland’s remote location and relatively small community. Currently the majority of waste is sent to landfill on a single landfill site to the north of Lerwick.

Not all sustainable measures used for waste management on mainland Scotland are suitable for Shetland.

### 4.2.8 Cultural Heritage

**Background**

Shetland possesses a rich heritage and is home to many sites of historical value including Viking settlements, brochs, standing stones, ancient crofts and ruined chapels. These are all important contributors to Shetland's strong and unique cultural identity. A number of areas and features have been designated due to their historical importance.

**Designated Areas**

*Scheduled Monuments*

Scheduled Monuments are given legal protection under the Ancient Monuments and Archaeological Areas Act 1979 as they are considered to be of national importance. Shetland currently has 392 Scheduled Monuments (Source: http://portal.historicenvironment.scot/ - accessed on 30/03/2017)

*Shetland Sites and Monuments Record*

In addition to designated areas and buildings, the Shetland Amenity Trust maintains the Sites and Monuments Record. This holds records of all known sites, ranging from pre-historic to the Cold War. There are currently 8401 recorded sites; these are detailed in Table 4.15:

**Table 4.15 Shetland Sites and Monuments Record**

| Classification | Number of Sites in Shetland |
|---|---|
| Broch / possible broch | 145 |
| Chambered cairns | 128 |
| Souterrains | 27 |
| Fishing stations | 38 |
| Burnt mounds | 352 |
| Viking / Norse houses | 78 |
| Military remains | 436 |
| Wheelhouses | 8 |
| Other classifications | 7189 |

*Source: Val Turner, Archaeologist, Shetland Amenity Trust, Pers Comm 31/3/2017*

*Archaeological Sites*

In addition to the protected sites listed above, there is also the potential for development related activities to affect Shetland's many archaeological sites. Shetland's rich archaeological heritage includes Viking sites, standing stones, ancient crofts and ruined chapels. Whilst many sites are identified within the Sites and Monuments Register, there is the potential for unknown archaeological sites to be affected.

*Designated Wrecks*

There are two protected wrecks in Shetland waters which have been designated due to their importance in terms of their historical and archaeological value. These have exclusion zones surrounding the wrecks, within which it is an offence, without

a licence, to tamper with, damage or remove any objects or part of the vessel or to carry out any diving or salvage operation. The wrecks are the Wrangles Palais, which sank in 1687 (100m exclusion zone) and the Kennemerland, which sank in 1664 (250m exclusion zone). These vessels now lie within the designated area of the Out Skerries Historic Marine Protection Area (MPA), designated for the purpose of preserving marine historic assets of national importance which are located within the area.

*Conservation Areas*
A Conservation Area is 'an area of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance' (Planning (Listed Buildings and Conservation Areas) Act 1990). There are three Conservation Areas in Shetland:

- Lerwick Lanes Conservation Area
- Lerwick New Town Conservation Area
- Scalloway Conservation Area

*Listed Buildings*
Buildings are listed by Historic Environment Scotland for their special architectural or historic interest. They are assigned to one of three categories depending on relative importance:

- Category A - Of national or international importance either historic or architectural, or fine little-altered examples of a particular period, style or building type;
- Category B - Of regional or more than local importance, or major examples of a particular period, style or building type which may have been altered; and
- Category C - Of local importance, lesser examples of any period, style or building type, as originally constructed or altered; and simple, traditional buildings grouped well with other in categories A and B or part of a planned group such as an estate or industrial complex.

The current (2017) number of listed buildings in the Shetland Islands is 341, in the following categories:

- Category A: 12
- Category B: 172
- Category C: 157

Table 4.16 indicates the number and category of listed buildings in each Shetland district.

**Table 4.16 Listed Buildings in Shetland**

| Location | Cat A | Cat B | Cat C | Total |
|---|---|---|---|---|
| Bressay | 1 | 10 | 3 | **14** |
| Delting | 0 | 10 | 4 | **14** |
| Dunrossness | 2 | 19 | 8 | **29** |
| Fetlar | 1 | 2 | 4 | **7** |
| Lerwick | 3 | 56 | 46 | **105** |

| | | | | |
|---|---|---|---|---|
| Lerwick Landward | 0 | 1 | 1 | **2** |
| Nesting | 0 | 14 | 8 | **22** |
| Northmavine | 0 | 10 | 8 | **18** |
| Sandsting & Aithsting | 1 | 7 | 6 | **14** |
| Tingwall | 1 | 10 | 29 | **40** |
| Unst | 2 | 10 | 12 | **24** |
| Walls & Sandness | 0 | 13 | 10 | **23** |
| Yell | 1 | 10 | 18 | **29** |

*Source: http://portal.historicenvironment.scot/ - accessed on 30/03/2017*

*Gardens and Designed Landscapes*

There are four sites designated as Gardens and Designed Landscapes from the Inventory of Gardens and Designed Landscapes in Scotland can be found in the Shetland Islands19. They are;

- Belmont House (NGR: HP 563 009);
- Brough Lodge(NGR: HU 579 926);
- Lunna House (NGR: HU 486 691); and
- Gardie House (NGR: HU 487 421).

*Source: http://portal.historicenvironment.scot/ - accessed on 30/03/2017*

### 4.2.9 Landscape

**Landscape Character**

SNH, in conjunction with partner councils, has undertaken detailed review and classification of the various landscape areas and types in Scotland. The Shetland landscape character assessment (Gillespies 1998 . A landscape assessment of The Shetland Isles . Scottish Natural Heritage Review No 93) identifies seven primary landscape types which are further subdivided into detailed landscape character areas. Inland landscapes are characterised by rolling hills, heather and rough grassland with historic buildings and features. Historic land use practices, particularly crofting and peat cutting, have helped to create the diverse landscapes. These landscape types are listed below:

- Coastal edge
- Farmed and settled lowlands and coast
- Farmed and settled voes and sounds
- Inland valleys
- Major uplands
- Peatland and moorland
- Undulating moorland with lochs

**Designated Areas**

*National Scenic Areas (NSA)*
These are areas of exceptional scenic value and comprise some of the best examples of Scotland's landscapes. National Scenic Areas are regulated through the Town and Country Planning (Scotland) Acts. One NSA in Shetland covers seven of Shetland's finest sections of coastline. The locations of the seven zones are shown on Figure 4.5 and listed below:

- Hermaness (including Muckle Flugga and the western slopes of Saxa Vord);
- Fethaland (broad coastal strip from Uyea to Burravoe in Northmavine);
- Eshaness (including Hillswick Ness and the intervening coastline);
- Muckle Roe (western half of the island);
- Foula;
- Fair Isle; and
- South West Mainland (from Fitful Head to Weisdale Voe and Skeld and including Burra, Trondra and the islands to the north).

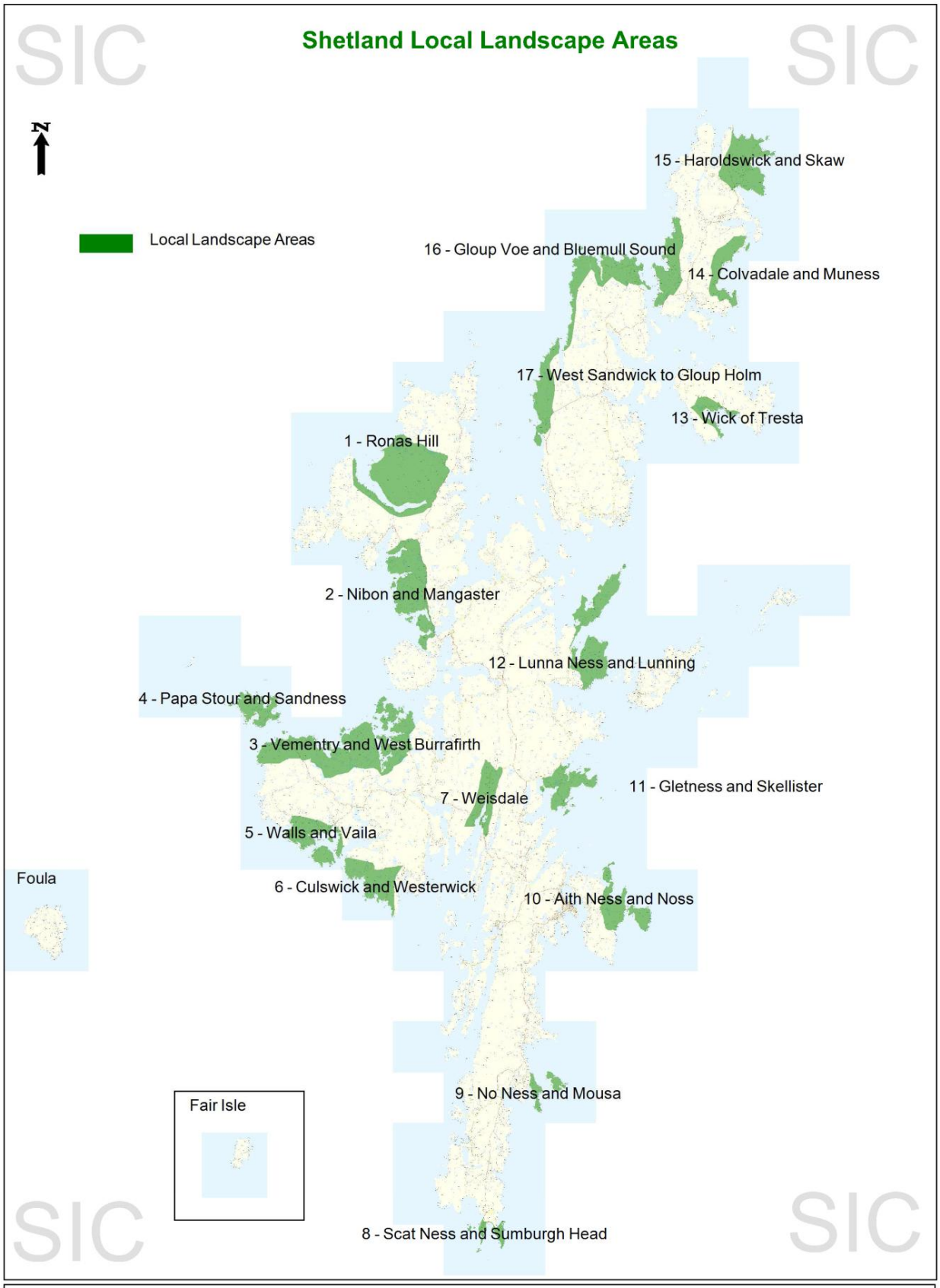
*Tree Preservation Orders (TPO)*
Under the Town and Country Planning (Scotland) Acts, the SIC must be given prior notification of intended works to protected trees. It is an offence to chop down, top, lop or wilfully destroy trees protected by a TPO without consent. There are 5 TPOs in Shetland as follows:

- Helendale House, Lerwick
- Montfield Hospital, Lerwick
- Smiddy Closs, Scalloway
- Sycamore Avenue and Ingaville House, Scalloway

*Local Landscape Areas (LLAs) (proposed)*
The purpose of the LLAs is to ensure sympathetic siting and design of new development within them. These areas are currently proposed in the Supplementary Guidance to the Shetland Local Development Plan, but have not yet been designated. The proposed Local Landscape Areas are as follows and are shown on Figure 4.5.

1. Ronas Hill
2. Nibon and Mangaster
3. Vementry and West Burrafirth
4. Papa Stour and Sandness
5. Walls and Vaila
6. Culswick and Westerwick
7. Weisdale
8. Scat Ness and Sumburgh Head
9. No Ness and Mousa
10. Aith Ness and Noss
11. Gletness and Skellister
12. Lunna Ness and Lunning
13. Wick of Tresta
14. Colvadale and Muness
15. Haroldswick and Skaw
16. Gloup Voe and Bluemull Sound
17. West Sandwick to Gloup Holm

**Figure 4.5 National Scenic Areas, Wild Land and Proposed Local Landscape Areas**






Date
Oct 2015

## 4.3 CURRENT ENVIRONMENTAL ISSUES

Schedule 2 of the 2005 Act requires that the Environmental Report includes a description of existing environmental problems, especially those relating to any areas of particular environmental importance. The purpose of this section is to explore the key environmental issues that are relevant to the SIC and whether the Onshore Wind Energy SG is likely to have an effect either positively or negatively on these issues.

This review of environmental problems, issues and opportunities across Shetland, both strategically and in the context of the Onshore Wind Energy SG, has been undertaken by the Planning Service. The process has involved:

- reviews of issues from relevant strategies, plans and programmes;
- review of baseline environmental data;
- Planning Service knowledge of environmental conditions in Shetland;
- Planning Service knowledge of contemporary national (and regional) environmental issues relevant to general development;
- input from relevant Shetland Islands Council Officers .

A summary of the key findings of the review is presented below. Where appropriate, opportunities for the environment in relation to the Onshore Wind Energy SG are included.

Current environmental issues that have been identified are:

### 4.3.1 Biodiversity, Flora and Fauna

*Strategic Context*

- Protected species by their nature are mobile and frequently rely on areas of land and sea that lie outside of the boundaries of protected sites. Seabirds nesting within designated sites are dependent on sea areas outwith the sites while raptors, wading birds and otters often rely on the use of land outwith designated sites. Therefore these animals may be particularly sensitive to development.
- Owing to changes in sea temperature and the predicted effects of climate change populations of some species may migrate away from, or migrate towards, the Shetland Islands. This would have many knock-on effects for protected species (under national and international legislation).
- There could be in migration of new species, including invasive non-native species (INNS), that could also impact on Shetland's biodiversity
- Population decline and loss of biodiversity is a global problem, and this extends to the Shetland Islands.

*Onshore Wind Energy SG Context – Issues and Problems*

- The risk of direct and indirect impacts on designated sites (European, national and local), European Protected Species and nationally important species, caused by wind energy developments.

- Loss of habitat and species associated with land under consideration for wind farm development.
- A number of moorland breeding species occur in Shetland at much higher densities than elsewhere in Britain (these include golden plover and red-throated diver, both of which are on Annex 1 of the Birds directive, whimbrel, of which Shetland holds 9% of the GB population and great skua, of which Shetland has 43% of the GB population). The potential for wind energy developments to affect regional and national populations of these species adversely is likely to be a constraint on such developments.
- Changes in land use resulting in changes to habitat composition (as well as landscape change) caused by the wind farm and associated infrastructure.
- Habitat fragmentation and severance associated with new wind energy developments.
- Disturbance of species from construction works, operational works and traffic.
- Direct species loss.
- Potential for wind energy developments to have cumulative impacts beyond those commonly associated with the construction of turbines. Wind energy development may require further infrastructure in order to make it viable (particularly for larger developments, if the energy generated is to be exported to the Scottish mainland).

*Opportunities*

- Ensuring that new wind energy development does not affect designated sites or important species.
- Planning development to avoid severance and fragmentation.

### 4.3.2 Population and Human Health

*Strategic Context*

- Shetland's population is expected to change over the next 20 or so years, the trend shows a gradual increase in the proportion of older people within the Shetland population, relative to younger people. It is generally felt that higher demand will continue to increase the cost of providing care. This is a trend replicated across Scotland, but because of the remoteness of some of Shetland's communities particular issues of accessibility and social exclusion may make a significant impact on them. Those in the Shetland community without easy access to private car use have difficulty in accessing certain services and opportunities. This affects peoples' opportunity to access employment, education, social events and to purchase healthy food at a reasonable cost. This is a particular problem for those in outlying communities or those with mobility problems.
- Although many older people will be fit and active well into later life, the occurrence of disability increases with age. Therefore if we can use planning policy to encourage an increase in the number of specially adapted houses in locations that reduce or eliminate the need to travel by car and give good access to local infrastructure and services this should help to allow older people to live richer and more fulfilling lives. The provision of more specially

adapted accessible houses should also help younger disabled people to find good accommodation on the Islands.

- Scotland's Census 2011 estimated that Shetland has a population of 23,1671, spread across 16 inhabited islands. The main population and administrative centre of Lerwick is home to roughly 7,000 inhabitants and there are no areas in Shetland that would meet the statistical definition of 'urban' (resident population of 10,000 or more). The trend towards centralisation of the population towards the central mainland continues, as does the continuing decrease in population of the north isles.
- The large numbers of small, isolated communities that exist in Shetland mean that providing access to employment and essential services is challenging and costly.

*Onshore Wind Energy SG Context – Issues and Problems*

- Aerodynamic and engine noise from aerogenerators can affect sensitive receptors such as housing, hospitals and places of work.
- Nuisance caused by shadow flicker from turbine blades has been claimed to affect public health and well-being.
- Community severance effects e.g. by access tracks for turbine maintenance or safety of road crossings in vicinity of new developments.
- Loss of visual amenity and recreational space caused by wind energy development on open spaces.
- Impact of wind energy on the visual aspect of Shetland's environment, possibly leading to loss of tourism and associated employment.
- Potential for wind energy developments to have cumulative impacts beyond those commonly associated with the construction of turbines. Wind energy development may require further infrastructure in order to make it viable (particularly for larger developments, if the energy generated is to be exported to the Scottish mainland).

*Opportunities*

- Good operational practice offers the opportunity to minimise nuisance impacts and impacts on human health from construction.
- Planning activities offer opportunities for minimising community severance effects.
- Creating an environment into which successful planning applications for wind energy development may benefit the community by creating jobs.
- Direct benefits to communities through community benefit funds, which apportion some funds created by wind energy development to a local trust for use in community projects.
- Good design offers opportunities to avoid nuisance impacts from renewable energy devices and also development that impinges on outdoor privacy, open or greenspace.

### 4.3.3 Water

*Strategic Context*

- Because of the scarcity of areas available for water storage, Shetland has a finite water resource and so this must be carefully managed and protected.
- The ratio of coast to area of land in Shetland is high and the marine and coastal environment this creates is key to the prosperity of natural species and to economic activities. Maintaining a high marine water quality is therefore of paramount importance.

*Onshore Wind Energy SG Context – Issues and Problems (Freshwater Environment)*

- Flooding associated with insufficient drainage maintenance and capacity.
- Pressure on private abstractions.
- Water abstraction can affect important habitats.
- Surface discharges contaminated during construction or operation of developments.

*Issues and Problems (Marine Environment)*

- Direct and indirect impacts on coastal waters.
- Flooding and sea level rise.
- Pollution from construction related activities or from spills once development sites operational.

*Opportunities*

- Good site construction and operational practice offers the opportunity to minimise impact on the freshwater and marine environment.
- Good practice in surface and waste water management including the use of sustainable urban drainage schemes (SUDS) provides opportunities to protect the water environment.

### 4.3.4 Soils and Geology

*Strategic Context*

- Shetland has a unique geology that should be protected from harm. Shetland is a UNESCO European Geopark and uses its exceptional geological heritage to promote sustainable development, particularly in the field of tourism and education. Shetland's earth heritage is therefore of economic value as well as academic interest. Inappropriate development can be damaging to earth heritage if it destroys or obscures geological features, however if development is appropriate and sympathetic to its surroundings it can also be beneficial in restoring those sites that have been damaged in the past.
- Peat deposits on the Shetland Islands can pose a serious landslip hazard if there is a period of drought followed by heavy rain. This particular issue has implications for soil and geological resources, biodiversity, water quality, flooding and the safety of property and life.
- Blanket bog is an important and internationally rare habitat that also provides a significant sink for carbon dioxide. Developments which disturb the

hydrology or physical structure of bogs can affect the stability of peatland over a much wider area, with implications for both its ecology and the release of CO2. Peat bogs also emit methane and research is ongoing to further understand the sink/emission balance.
- Peat can be lost to erosion if the hydrological balance is disturbed, causing it to dry out.
- Land available for agriculture on the Shetland Islands has traditionally been of poor quality. This, added to the fact that there is an economic demand for Shetland's farming products (e.g. Shetland lamb) means that pressure to 'improve' land for agriculture needs to be balanced against conservation interests and other land uses such as wind energy and other development.

*Onshore Wind Energy SG Context– Issues and Problems*

- Direct and indirect impact on statutory and non-statutory designated sites (these include geological Sites of Special Scientific Interest (SSSI), geological Local Nature Conservation Sites (LNCS), Geological Conservation Review (GCR) Sites and Regionally Important Geological Sites (RIGS).
- Direct and indirect impact on the Geopark.
- Pressure on soil resources from inappropriate development.
- Pressure on the peat resource from inappropriate development including the exacerbation of land slip and erosion risks (particularly from access tracks to new developments).
- Potential for wind energy developments to have cumulative impacts beyond those commonly associated with the construction of turbines. Wind energy development may require further infrastructure in order to make it viable (particularly for larger developments, if the energy generated is to be exported to the Scottish mainland).

*Opportunities*

- Sensitive siting and good operational practice offers the opportunity to minimise impact on soils and geology.
- Following advice on avoidance of soil and peat instability.
- Avoidance of areas where peat is at risk.

### 4.3.5 Material Assets

*Strategic Context*

- Allowing for future changes in supply and demand for oil and gas must be taken into account as these commodities already form a large proportion of the local economy.
- The drive for sustainable energy sources on the Shetland Islands means that a number of renewable energy options are being taken forward. The environmental impact of such schemes may have the potential to cause significant environmental effects.
- Shetland has few options available for waste disposal and currently the majority of waste is sent to a single landfill site to the north of Lerwick.

- A great deal of food, goods and materials are imported from outside the community. This means that transportation by sea is vital and the environmental effects of such activities are difficult to mitigate.
- As a result of the heightened coastal flood risk on Shetland, a large amount of material resources are used to build coastal defences. Locally quarried rock armour is often used for this purpose.

*Onshore Wind Energy SG Context – Issues and Problems*

- Plant, equipment and transport related fuel and energy use.
- Pressure for aggregates to be used in access track construction, and associated effects of extraction and transport to sites.
- Development on 'greenfield' sites.
- Potential for wind energy developments to have cumulative impacts beyond those commonly associated with the construction of turbines. Wind energy development may require further infrastructure in order to make it viable (particularly for larger developments, if the energy generated is to be exported to the Scottish mainland).
- Landscape and visual impacts of quarry operations in sensitive landscapes.

*Opportunities*

- Promote wise use of existing road and other transport infrastructure.
- Development on 'brownfield' sites.
- Promote reduction in use of non-renewable resources.
- Promote re-use of aggregates and other road materials.
- Opportunity to exploit the potential for renewables in the face of dwindling oil resource.

### 4.3.6 Climatic factors

*Strategic Context*

- A large proportion of the houses, roads and economic infrastructure on Shetland are located at the coast. The properties may therefore be more susceptible to coastal flooding than other places in Scotland.
- Strong westerly storms are a feature of the weather and as a result of this storm management measures may be needed to avoid coastal flooding.
- Meeting targets for reducing greenhouse gases poses a challenge as there is a lack of infrastructure that will be needed to deliver this.
- Shetland communities, businesses and individuals face higher fuel costs and often have harder-to-heat housing that is more difficult to make more energy efficient than elsewhere in Scotland.
- Shetland has more extreme weather conditions with fewer overall non-heating days meaning communities must heat their properties for a significantly longer period than elsewhere in Scotland
- Shetland has a more limited range of heating options, often at greater cost than elsewhere in Scotland, which further exacerbates fuel poverty rates on the Islands that are some of the highest in Scotland.

*Onshore Wind Energy SG Context – Issues and Problems*

- Emissions of greenhouse gases from operational plant, equipment, traffic and transport.
- In some cases the disturbance of the soil can contribute to releasing significant quantities of CO2 into the atmosphere, thus contributing to the emissions of greenhouse gases. Peat is especially vulnerable to this affect.
- Rising sea levels.
- Embodied carbon within the concrete base of wind turbines and within the steel used to fabricate the turbines.

*Opportunities*

- Replacement of existing oil-fired power station that currently supplies Shetland's electricity, with a clean and sustainable alternative, which gives off no operational CO2 emissions.

### 4.3.7 Air Quality

*Strategic Context*

- Shetland has an outstandingly high air quality due to its exposed position and lack of air polluting developments. Maintaining this high level of air quality must be a priority as any degradation would have effects on sensitive species and on the human population.
- Although air quality issues are relatively minor on Shetland (because of their isolated location and consistently windy conditions) large developments do have the potential to adversely affect air quality and cause localised nuisances associated with noise, odour and dust emissions. Quarrying, energy production, shipping and activities relating to the fishing industry all have the potential to generate nuisance effects and adversely affect air quality.

*Onshore Wind Energy SG Context – Issues and Problems*

- Levels of NO2 and PM10 associated with plant, equipment and traffic flows associated with new developments.
- Noise, other nuisance (e.g. shadow flicker and reflected light) from turbines and dust and noise emissions from other plant, equipment and traffic.
- Increasing traffic flows associated with new developments.

*Opportunities*

- Replacement of existing oil-fired power station, which currently supplies Shetland's electricity, with a clean and sustainable alternative.
- Improvement to plant, equipment and vehicles (e.g. greener equipment and cleaner fuels and vehicles used during construction).

### 4.3.8 Cultural Heritage

*Strategic Context*

- The Shetland Islands have a strong cultural identity and maintaining this into the future should be recognised as an important aim, supported by clear objectives.
- There is also a wealth of archaeological resources on the islands that date back to prehistory, encroachment of development could have the potential to threaten the setting or the integrity of such sites if unmitigated.

*Onshore Wind Energy SG Context – Issues and Problems*

- Direct and indirect impacts on statutory and non-statutory designated sites and the impact on their settings (Scheduled Monuments (SMs), Listed Buildings (LBs), Designed Landscapes and Conservation Areas), and other sites recorded on the Sites and Monuments Record (SMR).

- Need to take account of and conserve important historic landscapes and specific sites such as Viking Unst, Mousa, Beorgs of Uyea, Fethaland and Catpund.
- Risks of impacts on unknown and as yet undiscovered resources.
- Variety of locally important sites, which should be safeguarded.

*Opportunities*

- Policy on the placing of turbines would have the opportunity to direct wind energy to those locations that do have the minimum impact and away from any historical or culturally sensitive sites.

### 4.3.9 Landscape and Seascape

*Strategic Context*

- Scenic areas in Shetland are predominantly coastal and large parts of the islands are designated as National Scenic Areas (NSAs). This means that any wind farm developments on or near to the coast, which are highly conspicuous in nature, could potentially have an adverse effect on the landscape.
- Shetland is relatively low-lying with expansive, open views and there are very few trees on the islands. This means that there is less opportunity to screen wind farm developments or associated 'borrow pits' (small quarries for access track aggregate) and they may be highly visible over long distances and over large areas so they are more at risk of creating an adverse effect on the landscape if not carefully sited and planned.

*Onshore Wind Energy SG Context – Issues and Problems*

- Due to the relatively open topography any on-shore and off-shore wind energy development and its associated infrastructure is likely to have an impact on the landscape and visual amenity of Shetland.
- Direct and indirect impacts on designated sites (such as NSAs, Historic Gardens and Designed Landscapes).
- Gradual erosion of landscape character (cumulative effects).

*Opportunities*

- Policy on the placing of turbines would have the opportunity to direct wind energy to those locations that do have the minimum impact and potentially off- shore in the future.

## 4.4 FUTURE OF THE ENVIRONMENT IN THE ABSENCE OF THE ONSHORE WIND ENERGY SG

The principal purpose of carrying out an SEA is to anticipate and understand the impact the plan is likely to have on the environment of the plan area. The Directive also seeks examination of how the environment of Shetland is likely to evolve without the adoption and implementation of the Onshore Wind Energy SG.

There are a number of wind energy developments in Shetland already built, consented or at planning stages and these vary in scale from small through to the very large Viking Energy project. The absence of up to date wind energy development policies (which the Onshore Wind Energy SG presents) would mean that consideration of similar developments could be more challenging, with respect to full consideration of their social, economic and environmental impacts.

Existing Local Development Plan policies, together with the Onshore Wind Energy SG provide a framework for the development of renewable energy in Shetland. It is difficult to predict the likely evolution of some environmental aspects without the Onshore Wind Energy SG. However assumptions have allowed some trends to be assessed and these are reported in table 4.17.

A cable connecting Shetland to the mainland is required for any major development of large-scale wind farms to proceed, including the consented Viking Energy wind farm and there are a number of other projects that depend on such a cable also being planned.

**Table 4.17 Evolution of the Environment without the Onshore Wind Energy SG**

| SEA Topic (Section of the Environmental Issues) | Environmental Issues influenced by the Onshore Wind Energy SG | Evolution of the Environment without the Onshore Wind Energy SG |
|---|---|---|
| **Biodiversity, Flora and Fauna (Section 4.3.1)** | The SIC has a key role to play in influencing the behaviour of wind energy developers towards the issues of biodiversity and the natural heritage. This could be done through:<br>• Ensuring that new wind farm development does not affect designated sites or important species. International and national ecological designations will help to prevent or restrict development on the most environmentally sensitive sites but other factors such as migration routes must also be taken into account.<br>• Planning wind energy developments to avoid severance and fragmentation.<br>• Making sure that the impact of wind energy development on biodiversity is considered at the earliest opportunity alongside the impact of its supporting infrastructure (particularly for larger developments, if the energy generated is to be exported to the Scottish mainland). | Major renewable energy schemes (such as windfarms) could impact on habitats and species.<br><br>Existing policies within the LDP that focus on protecting designated sites (NH1 and NH4 ) and those that enhance biodiversity (LDP NH2 and NH3), together with the Local Nature Conservation Sites (LNCS) identified in the LNCS Supplementary Guidance (LNCS SG) would provide protection against the loss of biodiversity to any development, including wind energy development. However wind energy development can have specific impacts on particular species such as birds (e.g. impacts on local raptor species, effects on moving migratory bird populations, obstructions to flight paths and displacement of resident breeding species), and LDP policies may not draw sufficient attention to this.<br><br>The overall trend irrespective of the plan is therefore likely to be adverse. |
| **Population and Human Health (Section 4.3.2)** | Potential risks to population and health include:<br>• Aerodynamic and engine noise from aerogenerators can affect sensitive receptors such as housing, hospitals and places of work.<br>• Nuisance caused by shadow flicker from turbine blades can affect public and individuals' well-being.<br>• Community severance effects e.g. impacts of access tracks and safety of road crossings in vicinity of new developments<br>• Loss of visual amenity and recreational space caused by wind energy development on open spaces.<br>• Impact of wind energy developments on the visual quality and amenity value of Shetland's environment leading to loss of tourism and associated employment. | Local Plan policy ENG 7 (Control of Potential Nuisance from Energy Generators) LDP policy RE1 Renewable Energy does address the human impact of development of renewable energy and recognises the potential for wind energy developments to have cumulative impacts. However, it defers detailed consideration of these aspects to the Onshore Wind Energy SG<br><br>The overall effect is therefore considered to be slightly adverse in the absence of the Onshore Wind Energy SG. |

| SEA Topic (Section of the Environmental Issues) | Environmental Issues influenced by the Onshore Wind Energy SG | Evolution of the Environment without the Onshore Wind Energy SG |
|---|---|---|
| **Water (Section 4.3.2)** | Shetland has a finite water resource and so this must be carefully managed and protected. Maintaining a high marine water quality is also of paramount importance. | Current water and drainage policies within the LDP protect the water environment generally, and specifically water bodies and watercourses, against adverse impacts from development per se, rather than from wind energy development specifically.<br><br>LDP policies do not include a requirement for developers to protect catchments or implement, complete and maintain any mitigation works. The overall effect is therefore considered to be slightly negative in the absence of the Onshore Wind Energy SG. |
| **Soils and Geology (Section 4.3.4)** | The construction of wind farm developments (including turbines and access tracks) has the potential to impact on important peat resources and cause soil contamination from activities undertaken at the construction sites (e.g. fuel spillages/leakages, surface water scouring of suspended solids etc) as a well as cause erosion from run-off and peat stability/slippage.<br><br>In some cases the disturbance of the soil can contribute to releasing significant quantities of $CO_2$ into the atmosphere, thus contributing to the emissions of greenhouse gases. Peat is especially vulnerable to this effect. | **Soil and Peat**<br>Existing LDP policy (NH5 Soils) refers to avoidance of unacceptable effects on soil resources and Interim Planning Policy Minerals (Minerals IPP) policy (SPG MIN 4) refers to protection of peat against unsustainable commercial peat extraction. However, the potential impacts of development (wind or otherwise) on the islands' peat resources is not specifically addressed. SIC Construction and Design IPP Policy SPG 26 (General Requirements for All New Developments) places protection on peat resources but does not mention the risk of peat slip or the carbon cost of disturbing peatland.<br><br>The Onshore Wind Energy SG has an important role to play in ensuring that wind energy development does not proceed in such as way as to destroy important peat and soil resources. The overall effect on soil and peat is therefore considered to be strongly adverse in the absence of the Onshore Wind Energy SG.<br><br>**Geodiversity**<br>The SIC Minerals IPP sets out a suite of policies aimed at protecting Shetlands geological resources from inappropriate exploitation or harm from unsuitable development. The Minerals |

| SEA Topic (Section of the Environmental Issues) | Environmental Issues influenced by the Onshore Wind Energy SG | Evolution of the Environment without the Onshore Wind Energy SG |
|---|---|---|
| | | LDP policy NH6 Geodiversity provides a framework to protect geology and geomorphology whilst further detailed guidance on soil management and conserving geodiversity is to be set out in the Natural Heritage Supplementary Guidance (Natural Heritage SG)<br><br>The Minerals IPP provides a partial framework for protecting geodiversity and, while the Onshore Wind Energy SG should complement the Minerals IPP, the Natural Heritage SG also requires to be adopted for geodiversity to be fully protected in the Planning process. In the absence of these two policy documents protection of geodiversity would be incomplete so without Onshore Wind Energy SG the resulting impact on geodiversity would therefore be adverse. |
| **Air Quality (Section 4.3.7)** | The Shetland Islands have an outstandingly high quality of air, due to their exposed position. Maintaining this high level of air quality must be a priority as any degradation would have effects on sensitive species and on the human population. Housing and commercial development has the potential to impact on air quality through:<br>• Levels of nitrogen dioxide (NO2) and PM10 (particulate matter - particles of soot (carbon), metals or inorganic salts) associated with plant, equipment and traffic flows associated with new developments<br>• Pollution from plant, equipment and traffic<br>• Increasing traffic flows associated with new developments<br>• Dust from extraction activities (at a localised level)<br>• Possible cumulative impacts from traffic from various developments | Shetland's energy is currently derived from an oil-fired power station. The absence of the Onshore Wind Energy SG will not necessarily mean that the move towards cleaner energy ceases, but it will mean that a potential cleaner energy source lacks a clear framework for development.<br><br>Specific policies within the Onshore Wind Energy SG do address how best to develop Shetland's wind energy sector and in the absence of the plan it is clear that progress would be slowed down with consequential localised effects on air quality (especially around the oil fired power station in Lerwick, which is the current source of the greater proportion of Shetland's energy). The overall effect is therefore considered to be slightly adverse in the absence of the Onshore Wind Energy SG. |

| | | |
|---|---|---|
| **Climatic Factors (Section 4.3.6)** | • Emissions of greenhouse gases from energy generation on Shetland and in Scotland<br>• Predicted increases in storm event frequency and severity from climate change in future<br>• Rising sea levels<br>• Dependency on oil | Wind energy development on Shetland has the potential to contribute to Scotland's commitment to an 80% reduction in greenhouse gas emissions by 2050.<br><br>Rather than allowing wind energy generation on too large a scale (that may compromise other aspects of the environment) or too small a scale (that may fail to realise the full potential for wind energy to contribute to the creation of a sustainable energy mix), Shetland should seek to realise the optimum potential for wind energy generation. In the absence of the Onshore Wind Energy SG the opportunity for the SIC to carefully plan to achieve this optimum will be lost. Although wind energy development may still proceed, it would do so in a 'piece meal' or fragmented way, thus reducing the potential contribution that Shetland can make to reducing Scotland's greenhouse gas emissions.<br><br>In this respect the evolution of the environment without the plan would be largely adverse.<br><br>As an outcome of the Scottish Climate Change Act (2009) there should be an overall decrease in $CO_2$ emissions attributable to Scotland, in line with reduction targets, even in the absence of the Onshore Wind Energy SG. On a global scale, however, without substantial and immediate cuts in greenhouse gas emissions it is likely that climate change will continue unabated. SEPA in its State of Scotland's Environment 2006 report states that Scotland needs to "take action to tackle the problem and to prepare itself for the inevitable impacts".<br><br>Therefore, climate change is certain to continue even in the absence of the Onshore Wind Energy SG so the overall effect will be adverse. |

| SEA Topic (Section of the Environmental Issues) | Environmental Issues influenced by the Onshore Wind Energy SG | Evolution of the Environment without the Onshore Wind Energy SG |
|---|---|---|
| **Material Assets (Section 4.3.5)** | • Plant, equipment and transport related fuel and energy use<br>• Pressure for aggregates to be used in access track construction, and associated effects on the environment of extraction and transport to sites<br>• Development on brownfield sites<br>• Development on greenfield sites<br>• Potential for wind energy developments to have cumulative impacts beyond those commonly associated with the construction of turbines. Wind energy development may require further infrastructure in order to make it viable. | Policy on the use of aggregates in development is set out in the Minerals IPP. Within this document, Policy SPG MIN 11 details which sites can be used as borrow pits, such as might be needed to create access tracks, and sets key environmental requirements that borrow pit excavation must meet including restoration. Policies within this document further define how mineral resources will be protected and used in a sustainable manner. Given the extensive policy framework in existence within the Minerals IPP the presence or absence of the Onshore Wind Energy SG on this will be neutral.<br><br>LDP policy ED1 deals with the placing of business and industry proposals in existing rural settlements, and in the open countryside, and therefore give some steer on how development will be dealt with on greenfield and directed toward brownfield sites. However, wind energy may not typically lend itself to being sited on brownfield land as some brownfield land may be sensitive to such development for other reasons. Further indication as to the suitability of particular locations is given in the Onshore Wind Energy SG and in the absence of such policy the impact on material assets will be negative. |

| SEA Topic (Section of the Environmental Issues) | Environmental Issues influenced by the Onshore Wind Energy SG | Evolution of the Environment without the Onshore Wind Energy SG |
|---|---|---|
| **Cultural Heritage (Section 4.3.8)** | There is a wealth of archaeological resources on the Islands that date back to prehistory, and encroachment of wind energy development could have the potential to threaten the setting or the integrity of such sites if unmitigated.<br><br>There is however, an opportunity to place wind energy in the best possible locations, using a strategic approach to map the areas of cultural and historical sensitivity, and then avoiding these sites and their setting. The creation of the policy also provides the opportunity to engage with stakeholders to find those areas that are less constrained. | LDP policies HE1-HE5 set out how these cultural assets are to be conserved and state that the Council will refuse development proposals that would have a significant adverse effect on the integrity or character of historically designated sites. It therefore gives strong protection to those sites that are locally, nationally and internationally protected.<br><br>These policies do not recognise the specific issues around the siting of wind energy development and the potential for large developments to cumulatively impact upon historical sites.<br><br>The overall effect is therefore considered to be adverse in the absence of the Onshore Wind Energy SG. |
| **Landscape and Seascape (Section 4.3.9)** | Due to the generally open and undulating topography any onshore and offshore wind energy development and its associated infrastructure is likely to have an impact on the landscape or seascape and the visual amenity of Shetland. Inappropriate or insensitive development could therefore affect the capacity of the landscape to absorb new infrastructure. It could also lead to the gradual erosion of landscape character (cumulative development effects). With the implementation of the Onshore Wind Energy SG there are opportunities to direct wind energy development to areas most able to accommodate it. | Existing Policy within the LDP does protect the landscape and designated sites against adverse impacts from development. However, Onshore Wind Energy SG contains development management criteria to assess these factors specifically in relation to onshore wind generation development and infrastructure and will influence developers on where commercial aerogenerators are likely to have the least visual impact on the landscape through its policies and measures.<br><br>In the absence of the plan wind energy development could be proposed in areas which do not have the best possible combination of landscape features and low visual sensitivity that is needed. The overall effect is therefore considered to be adverse in the absence of the Onshore Wind Energy SG. |

# 5 ASSESSMENT OF THE ENVIRONMENTAL EFFECTS AND PROPOSED MITIGATION

## 5.1 INTRODUCTION

The procedure for assessing the likely environmental impacts of the Onshore Wind Energy SG has been described in Section 2.6. An overall summary of the environmental assessment of the Onshore Wind Energy SG Policies against the SEA objectives is given in Table 5.1. Although there were no explicit alternative plans or policies considered during development of the Onshore Wind Energy SG, consideration was given to development options with a wide range of environmental implications. How alternatives were assessed is discussed in Section 5.2.

## 5.2 ASSESSMENT OF ALTERNATIVES

The SEA Directive and the 2005 Act require the Environmental Report to consider the impacts of alternatives to the proposed plan as part of the SEA. There have not been any literal “alternatives” to the Onshore Wind Energy SG and its suite of policies since the SIC has sought an integrated and balanced approach to policy development right from the start. Rather than developing alternative policies the SIC has evolved its policy document in an iterative way making use of the SEA process during this “evolution” to remove any undesirable environmental effects, should they exist, and to make sure that environmental sustainability elements within the policies were strengthened where possible.

As a result, therefore, of this iterative assessment and consultation process some of the supporting text and objectives within the Onshore Wind Energy SG have been refined. The following summarises the overall impact that the SEA process has had in the evolution of the Onshore Wind Energy SG and the key changes made:

- widening of the understanding of the impact that developments can have through interactions with consultees;
- consideration of flood risks associated with future developments;
- recognition of the need to consider embodied energy and carbon associated with the manufacturing and construction of plant and equipment used in wind energy developments.

## 5.3 ASSESSMENT OF THE ONSHORE WIND ENERGY SG AND PROPOSED MITIGATION

### 5.3.1 Introduction

Building on the assessment that was undertaken for the individual policies of the Onshore Wind Energy SG (see Annex A), the Onshore Wind Energy SG has been considered as a whole in the context of the SEA Topics. Table 5.1 outlines the environmental effects that are predicted to arise as a result of the adoption of the Onshore Wind Energy SG and are summarised. In reaching the conclusions included in Table 5.1, professional judgement has also been exercised in considering the likelihood of secondary, cumulative, indirect and synergistic effects arising from the adoption of the proposed Onshore Wind Energy SG.

Overall, the assessment finds that the adoption of the plan will result in an improvement on the potential environmental consequences of adopting the “do minimum” approach outlined in Table 4.17 above.

Where appropriate, mitigation that is contained within the Plan is outlined and further suggestions for strengthening this are made.

**Table 5.1 SEA Appraisal Summary of the Onshore Wind Energy SG**

| SEA Topic | SEA Objectives | Summary Assessment of the 3 Spatial Policies and 9 Development Criteria |
|---|---|---|
| **Biodiversity, Flora and Fauna** | 1. To further the conservation of biodiversity | Summary Score: **0** for most but leading to √ in some cases<br><br>Wind Energy development and its associated infrastructure and access network could lead to a reduction in biodiversity (particularly for larger developments). The influence of the Shetland LDP (with the appropriate biodiversity protection policies) will be beneficial if policies are used vigorously not only to protect biodiversity but also to enhance it. The rigorous application of the policies that focus on protecting designated sites (such as NH1 and NH4) and those that enhance biodiversity (e.g. NH2 and NH3) would afford the necessary protection.<br><br>The Onshore Wind Energy SG itself sets out clear aims of avoiding any significant environmental effects on biodiversity. The introductory text in Paragraphs 4.10 to 4.12 Development Criterion 3 Natural Heritage within the Onshore Wind Energy SG makes it quite clear that relevant protective nature conservation legislation must be met as well as recognising the importance of protected species such as the otter and the importance of protecting their habitats and surrounding environment. |
| **Population and Human Health** | 2. To improve the quality of life for people and communities across Shetland<br><br>3.To improve the quality of human health in Shetland | Summary Score: **0** for most but leading to √ in some cases<br><br>Development Criterion 4 Impacts on communities sets out how onshore wind energy development should be assessed such that communities and the long term impacts on amenity including outdoor access, recreation and tourism opportunities are safeguarded. Such assessments should cover sensitive locations such as residential properties, schools and workplaces potentially sensitive to adverse impacts from wind turbines. This criterion covers a range of factors including visual amenity noise, shadow flicker, electromagnetic interference, designated sites, road safety and construction/ decommissioning logistics, impacts on access routes and recreation interests, phasing and any other identifiable significant effects which can all have significant effects on public health. |

| SEA Topic | SEA Objectives | Summary Assessment of the 3 Spatial Policies and 9 Development Criteria |
|---|---|---|
| | | LDP policy WD1 Flooding Avoidance considers flood risk that would require to be assessed so as to show developments do not create a flood risk to existing or proposed properties and/ or surrounding land. Developers will also require showing that appropriate acceptable mitigation measures can be undertaken to ensure no significant adverse impact on the natural and built environment as well as cultural heritage.<br><br>LDP policy GP1 Sustainable Development state that development will be planned to meet the economic and social needs of Shetland in a manner that does not compromise the ability of future generations to meet their own needs and to enjoy the area's high quality environment. Tackling climate change and associated risks is a major consideration for all development proposals. In addition GP3 All Development: Layout and Design states that all new development should be sited and designed to respect the character and local distinctiveness of the site and its surroundings.<br>Proposed developments should make a positive contribution to:<br>• maintaining identity and character<br>• ensuring a safe and pleasant space<br>• ensuring ease of movement and access for all<br>• a sense of welcome<br>• long term adaptability, and<br>• good use of resources<br><br>All recognise the importance of protecting the amenity and quality of life for Shetland residents and will therefore support the population and health related SEA objectives. |

| SEA Topic | SEA Objectives | Summary Assessment of the 3 Spatial Policies and 9 Development Criteria |
|---|---|---|
| **Soils and Geology** | 4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner | Summary Score: Broadly √<br><br>**Soil and Peat**<br>Existing LDP policy NH5 Soils refers to protection of soil resources and Minerals IPP policy (SPG MIN 4) protects peat against unsustainable commercial peat extraction, rather than the potential impacts of development (wind or otherwise) on the island peat resources.<br><br>The Onshore Wind Energy SG Development Criterion 3 (Natural Heritage) states a clear requirement for wind energy development to avoid impacts on peat. In addition, carbon calculations must be completed that show the carbon impact of developments have been minimised<br><br>**Geodiversity**<br>Existing LDP policy NH6 Geodiversity seeks to protect and/ or enhance important geological and geomorphological resources and sites and will be applied alongside the suite of policies within Minerals IPP, which provides a clear framework for the sustainable use of minerals and aggregates within the development context and the Natural Heritage SG. Geodiversity will therefore be protected at multiple levels of the planning process and so the impact of the Onshore Wind Energy SG on Geodiversity will be positive. |

| SEA Topic | SEA Objectives | Summary Assessment of the 3 Spatial Policies and 9 Development Criteria |
|---|---|---|
| **Water** | 5. To protect and enhance freshwater and marine water quality<br><br>6. To ensure that Shetland's water resources are used effectively and sustainably | Summary Score: Broadly **0** leading to √ in a number of cases<br><br>Existing LDP policy NH7 Water Environment seeks to protect the marine and freshwater natural environment of Shetland and there are policies that address pollution prevention (WD2 Waste Water).<br><br>Application of the Onshore Wind Energy SG Development Criterion 5 Water Resources will provide the requirement for developers to put into place the necessary mitigation against adverse effects on water resources. |
| **Air** | 7. To protect Shetland's air quality | Summary Score: **0** for most but leading to √ in some cases<br><br>Shetland's climate tends to ensure a high standard of local air quality and energy production from renewable resources such as wind does not a present a direct significant threat to local air quality. Because of the climatic conditions it is unlikely that additional traffic and transport created during the construction, operation and maintenance of wind energy developments will have a significantly adverse effect on air quality.<br><br>Policies/criteria within the Onshore Wind Energy SG are likely to broadly support the maintenance of local air quality by facilitating the growth of renewable energy, over time reducing reliance on existing fossil fuel based energy production. |

| SEA Topic | SEA Objectives | Summary Assessment of the 3 Spatial Policies and 9 Development Criteria |
|---|---|---|
| **Climatic Factors** | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO_2$ reduction target<br><br>9. To adapt to the predicted effects of climate change | Summary Score: Broadly **0**<br><br>**Carbon Emissions**<br>Wind energy development could carry a potential carbon cost relating to the following:<br>• Embodied carbon within building materials (e.g. from steel and concrete);<br>• Traffic and transport related carbon emissions during construction, operation and maintenance;<br>• Carbon emitted as a result of peat disturbance during construction.<br><br>However the support of wind energy development should help to reduce carbon emissions from energy generation in the longer term and will offset the greater amount of carbon emitted as a result of conventional fossil fuel powered energy production. Since the Onshore Wind Energy SG should help to facilitate the sustainable growth of renewable energy, its overall effect in contributing towards Scotland's 80% $CO_2$ reduction target should be strongly positive.<br><br>**Adapting to Climate Change and Flood Risk**<br>Depending on their location, wind farm sites could potentially be at risk from flooding or could cause or exacerbate localised flooding. Existing LDP Policy WD1 Flooding Avoidance seeks to ensure that developments do not create a flood risk to existing or proposed properties and/ or surrounding land or that appropriate acceptable mitigation measures can be undertaken to ensure no significant adverse impact on the natural and built environment as well as cultural heritage. |

| SEA Topic | SEA Objectives | Summary Assessment of the 3 Spatial Policies and 9 Development Criteria |
|---|---|---|
| **Material Assets** | 10.To promote the sustainable use of natural resources | Summary Score: Broadly **0** and √ in one or two cases<br><br>Policy on the use of aggregates in development is set out in the Minerals IPP. Within that document, Policy SPG MIN 11 details which sites should be used as borrow pits, particularly those that might be needed to create access tracks for wind farm developments, and sets key environmental requirements that borrow pit excavation must meet including restoration. Policies within this document further define how mineral resources will be protected and used in a sustainable manner.<br><br>Existing LDP Policy ED1 Support for Business and Industry and ED2 Commercial and Business Developments, supported by Business and Industry draft SG deal with the location of business and industry premises in existing rural settlements and in the open countryside and therefore give some steer on how development will be dealt with on greenfield sites and locational preferences. However, these policies may be difficult to apply directly to wind farm developments since wind energy has very specific locational requirements (since it will be dependent on exposure to, and availability of appropriate wind speeds). Also some land may be sensitive to such development for other reasons (such as proximity of housing and other sensitive receptors). Map 3 Group 1 and 2 areas with Local Safeguarding within the Onshore Wind Energy SG, shows those areas that are afforded substantial protection from development.<br><br>With regard to the minimisation of waste, Existing LDP Policy W5 Waste Management Plans and facilities in all new developments will ensure that material recycling, reuse and recovery is maximised and that a site waste management plan (SWMP) be included in any wind energy construction. Any negative impacts on waste generation will therefore be mitigated by the LDP. |

| SEA Topic | SEA Objectives | Summary Assessment of the 3 Spatial Policies and 9 Development Criteria |
|---|---|---|
| | | |
| **Cultural Heritage (including Architectural and Archaeological Heritage)** | 11. To conserve and protect the historic environment<br><br>12. To conserve and promote the distinctive cultural heritage | Summary Score: Broadly **0**<br>Existing LDP Policy HE1 Historic Environment states that:<br><br>The Council should presume in favour of the protection, conservation and enhancement of all elements of Shetland's historic environment, which includes buildings, monuments, landscapes and areas.<br><br>Subsequent Historic Environment policies HE2-HE6 deal with specific aspects of the historic environment and set out in detail how they should be protected and any likely harm mitigated. The Onshore Wind Energy SG is supportive of this SEA objective and will therefore have an overall neutral impact on the historic environment. |
| **Landscape** | 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes<br><br>14. To improve those landscapes and seascapes that are degraded | Summary Score: Broadly **0** leading to √ in some cases<br><br>The importance of Shetland's landscape and seascape is fully recognised in the Onshore Wind Energy SG. The SG establishes a number of protective measures against the degradation of the landscape including Development Criterion 1 Landscape and Visual Impact and 2 Cumulative Impacts, which set out requirements for wind energy development applications to be accompanied by full landscape and visual assessment including a cumulative assessment.<br><br>Strong guidance is given in the Map 3 Group 1 and 2 areas with Local Safeguarding on the locations of high sensitivity landscapes, which would be a constraint to wind energy development.<br><br>The resulting impact of the IPP on these SEA objectives would therefore be broadly neutral |

## 5.4 ENVIRONMENTAL IMPLICATIONS

### 5.4.1 Positive Implications

In general terms the Onshore Wind Energy SG does not generate any strongly negative environmental effects and puts into place a suite of Development Criteria that will mitigate inappropriate and environmentally damaging wind energy development. Overall the Onshore Wind Energy SG is likely to deliver a positive contribution to the broad environmental trends for Shetland. In the absence of the policies and Development Criteria the evolution of the SEA topic areas in general would be likely to show an adverse trend.

Overall, in environmental terms, the Onshore Wind Energy SG aims to:

- facilitate the creation of more sustainable forms of energy generation (from renewables);
- identify spatially, those geographical areas of Shetland least able to support wind energy because of their environmental, social, historical or visual sensitivity;
- outline the specific criteria planning applications for wind energy development must meet, in order to minimise the potential environmental impacts of wind energy development (e.g. air quality, water quality, visual etc);
- emphasise the importance of the protection of the natural and cultural heritage designations;
- ensure that new developments are environmentally sustainable.

*Climatic Factors*

Through:

- outlining the circumstances under which wind energy development can take place in order to optimise the carbon saving potential of this form of renewable energy while ensuring Shetland's environment and unique character are protected;
- seeking to encourage the application of sustainable development principles (that will include addressing the use of fossil fuels, energy efficiency, the role of renewables and climate change issues) through the requirements built into key overarching policies.

*Use of Natural resources and Material Assets*

Through:

- ensuring that waste is minimised and that reused or recycled materials are used wherever possible in wind energy development;
- directing development of wind energy away from inappropriate land (such as locally protected areas).

*Population and Health*

Through:

- seeking to encourage the application of best practice principles, that will include: addressing emissions of noise, shadow flicker from aerogenerators and other nuisances that can affect public health and well-being, addressing traffic and transport issues, addressing the need to maintain visual amenity, ensuring that water supply and quality is not affected by developments and through the requirements built into key overarching policies and development criteria;
- ensuring that the cumulative impact of numerous wind energy developments and their associated infrastructure is taken into consideration when assessing the impacts of a single wind energy development application.

*Air*

Through:

- facilitating the growth of renewable energy in place of existing energy production that utilises fossil fuels;
- ensuring that nuisances caused by construction (noise, dust, etc) are minimised.

*Soils and Geology*

Through:

- outlining a requirement for wind energy development to minimise disturbance of soil and peat in order to protect against peat slip and carbon emissions;
- protecting sites designated for their geological importance (including Sites of Special Scientific Interest and the Shetland Geopark).

*Water*

Through:

- seeking to encourage the application of best practice principles (that will include surface water drainage and management, groundwater/ hydrogeological survey and management, site-specific measures to minimise pollution etc) through the requirements built into specific Development Criteria.

*Landscape, Biodiversity and Cultural Heritage*

Through:

- seeking to encourage the application of sustainable development principles (that include recognising the importance of biodiversity, landscape and cultural heritage and the implementation of measures such as assessing the

landscape and ecological value of development proposals, assessing archaeological remains and historic features and implementing measures for their preservation and recording, etc) through the requirements built into specific Development Criteria;
- identifying spatially, those geographical areas of Shetland least able to support wind energy because of their environmental, social, historical or visual sensitivity;
- encouraging the adoption of environmental management systems and environmental performance standards to address the effects of developments on biodiversity, landscape and seascape, the historic environment and cultural heritage.

### 5.4.2 Indirect Environmental Implications

Notwithstanding the above positive elements it is likely that there will be environmental implications arising from any new wind energy developments that ultimately will come on stream as a consequence of this Onshore Wind Energy SG. Some issues are almost inevitable, and would arise as a result of any new type of development and these include:

- emissions of greenhouse gases from energy use and traffic both during construction and operational activities;
- embodied energy and carbon in plant and equipment used in wind energy developments;
- an increased burden on air quality from emissions generated by plant and equipment as well as traffic associated with any developments;
- threats to the water and soil environment from construction activities and changes to on-site drainage as a result of the development.

Other issues are highly dependent on the nature, scale and location of particular developments. It is likely that some future developments might have implications for biodiversity (for example damage to habitats, disturbance of species and loss or damage to particular flora and fauna), landscape and historic character (including visual impact, effects on landscape and historic features) and wider transport impacts during construction, operation and maintenance.

Although the SIC can and does influence developers to adopt sustainable development principles and best practice in avoiding and/ or mitigating any of these effects it has no direct control over the operation of individual developments. It is assumed that some of the above implications would be picked up more specifically by controls exerted by other agencies such as Scottish Natural Heritage, Scottish Environment Protection Agency (SEPA) and Historic Environment Scotland.

## 5.5 POSSIBLE CUMULATIVE EFFECTS ASSOCIATED WITH THE ONSHORE WIND ENERGY SG

A summary of the assessment of the possible cumulative effects is given in Annex D. Clearly to deal with some of the effects there will need to be supporting action at the Government or Agency level, for example to help deal with:

- **energy supply** and **$CO_2$** emissions;

- **reliance on fossil fuels;**
- **embodied energy** and **carbon;**
- **traffic** and transportation alternatives;
- **waste** management and disposal;
- **water** supply and treatment; and
- wider **biodiversity and geodiversity conservation** issues.

However the Onshore Wind Energy SG has a significant role to play in contributing to the management and mitigation of those effects associated with the role of the SIC as the Planning Authority. In particular the Onshore Wind Energy SG policies and Development Criteria can:

- steer new wind energy developments away from sites of nature conservation, landscape and seascape, historic and cultural heritage importance;
- address the contribution of the renewable energy development sector in Shetland to more global level issues (e.g. climate change, use of fossil fuels and energy, waste generation, loss of biodiversity) through influencing action at the local (Shetland) level;
- address resource use and material asset issues through encouraging more sustainable design and construction within new wind farm developments (e.g. effective waste minimisation, use of low embodied carbon materials in manufacture, fabrication and construction of turbines and associated infrastructure, sustainable sourcing of materials etc); and
- create the right development policy framework and approach to site design, location and construction that will help to provide proactive solutions to these problems.

Table 5.2 below summarises an assessment of the possible cumulative effects of the Onshore Wind Energy SG. An analysis of this table indicates that for each SEA objective the overall cumulative effect of the Onshore Wind Energy SG policies is broadly neutral (see “summary” column). Looking at the table as a whole in some instances the Onshore Wind Energy SG policies have a positive effect on the SEA objectives and in some cases a strongly positive effect.

Annex D summarises in more detail possible cumulative effects and the local and wider significance of these. The rigorous implementation of all of the Wind Energy Development IPP overarching policies and Development Criteria should help to mitigate any possible cumulative effects arising as a result of the implementation of the Onshore Wind Energy SG.

**Table 5.2 Summary Assessment of the Possible Cumulative Effects of the Onshore Wind Energy SG Policies and Development Management Criteria**

| SG Policy | SEA Objective | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1. To further the conservation of biodiversity | 2. To improve the quality of life for people and communities across Shetland | 3. To improve the quality of health in Shetland | 4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner | 5. To protect and enhance freshwater and marine water quality | 6. To ensure that Shetland's water resources are used effectively and sustainably | 7. To protect Shetland's air quality | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO_2$ reduction target | 9. To adapt to the predicted effects of climate change | 10. To promote the sustainable use of Shetland's natural resources | 11. To conserve and protect the historic environment | 12. To conserve and promote the distinctive cultural heritage | 13. To protect the special qualities and characteristics of Shetland's landscapes | 14. To improve those landscapes and seascapes that are degraded |
| LDP RE1 Renewable Energy | **0** | **0** | **0** | √ | √ | √ | **0** | **0** | **?** | √ | √ | √ | √ | **0** |
| Spatial Framework | √ | **0** | **0** | √ | **0** | **0** | **0** | **0** | **0** | √ | √ | √ | √ | **0** |
| DC1 Landscape and Visual Impact | **0** | **0** | **0** | √ | √ | **0** | **0** | **0** | **0** | √ | √ | √ | √ | **0** |
| DC2 Cumulative Impacts | √ | √ | √ | √ | √ | √ | **0** | **0** | **0** | √ | √ | √ | √ | **0** |

| SG Policy | SEA Objective | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1. To further the conservation of biodiversity | 2. To improve the quality of life for people and communities across Shetland | 3. To improve the quality of health in Shetland | 4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner | 5. To protect and enhance freshwater and marine water quality | 6. To ensure that Shetland's water resources are used effectively and sustainably | 7. To protect Shetland's air quality | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO_2$ reduction target | 9. To adapt to the predicted effects of climate change | 10. To promote the sustainable use of Shetland's natural resources | 11. To conserve and protect the historic environment | 12. To conserve and promote the distinctive cultural heritage | 13. To protect the special qualities and characteristics of Shetland's landscapes | 14. To improve those landscapes and seascapes that are degraded |
| Development Criteria 3 Natural Heritage | √√ | **0** | **0** | √√ | √ | **0** | **0** | **0** | **0** | √√ | **0** | **0** | √ | **0** |
| Development Criteria 4 Impacts on Communities | **0** | √√ | √ | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | √ | √√ | **0** |
| Development Criteria 5 Water Resources | **0** | **0** | **0** | **0** | √√ | √ | **0** | **0** | **0** | √ | **0** | **0** | **0** | **0** |
| Development Criteria 6 Decommissioning | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | √**0** | **0** |

| SG Policy | SEA Objective | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1. To further the conservation of biodiversity | 2. To improve the quality of life for people and communities across Shetland | 3. To improve the quality of health in Shetland | 4. To protect Shetland's peat, soils and geological resources and use them in | 5. To protect and enhance freshwater and marine water quality | 6. To ensure that Shetland's water resources are used effectively and sustainably | 7. To protect Shetland's air quality | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO_2$ reduction target | 9. To adapt to the predicted effects of climate change | 10. To promote the sustainable use of Shetland's natural resources | 11. To conserve and protect the historic environment | 12. To conserve and promote the distinctive cultural heritage | 13. To protect the special qualities and characteristics of Shetland's landscapes | 14. To improve those landscapes and seascapes that are degraded |
| Development Criteria 7 Historic Environment | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | √√ | √√ | √ | **0** |
| **Summary** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | √ | **0** | **0** | √ | **0** |

**√** **Overall effect likely to be positive and supportive**
**√√** **Clear strong positive effects**
**X** **Overall effect likely to be negative**
**?/X** **Uncertain possible negative effect**
**0** **Neutral effect** **0/ √** **Neutral or possible positive effect**
**?/ √** **Uncertain possible positive effect**
**?/ 0** **Uncertain possible neutral effect**
**?** **Uncertain effect**
**0/ X** **Neutral or possible negative effect**

## 5.6 PROPOSED MITIGATION

As indicated in Section 5.4 above the precise effects of some of the Onshore Wind Energy SG overarching policies and Development Criteria are clearly going to be difficult to predict at a very local level. The effects, whether positive, negative or cumulative will depend on:

- how policies are implemented on the ground;
- the precise nature of any proposed wind energy developments that are taken forward;
- the environmental characteristics of the potential locations.

Mitigation has been developed within the wording of policies and in particular the Development Criteria and there were no cases where any of these were found to generate an overall negative environmental impact or clear, strong negative impacts on any of the SEA objectives. It is of course important to recognise that the policies and criteria must be simultaneously applied and not considered in isolation. Table 5.3 below summarises the more detailed information in Annex D and indicates mitigation of possible cumulative environmental effects associated with the Onshore Wind Energy SG.

**Table 5.3 Application of Policies that will help to mitigate Potential Cumulative Environmental Effects associated with the Wind Energy Development IPP**

| Potential Cumulative Environmental Effect | Wind Energy Development IPP Policies, Structure Plan and Local Plan Policies that will help to Mitigate possible Cumulative Effects |
|---|---|
| Water Resources (water use and water quality impacts) | LDP RE1 Renewable Energy policy, Onshore Wind Energy SG Development Criterion 5 – Water Resources and in conjunction with the overarching LDP policies that set out broad requirements for implementing sustainable development, water and drainage and waste management measures (e.g. Policies GP1-GP3 (General Policies), W1-W5 (Waste) and WD1-WD3 (Water and Drainage) |
| Impacts on designated sites<br>Loss of Biodiversity | LDP NH1 and NH4 and Onshore Wind Energy SG DC3 Natural Heritage |
| Climatic Factors - Traffic Levels and Congestion and embodied energy and carbon | Onshore Wind Energy SG DC4 Impacts on communities and in conjunction with the overarching LDP policies that set out broad requirements for implementing sustainable development, protecting natural heritage, transport options and renewable energy technology (GP1, GP2, NH1, NH3, TRANS1 and RE1 |
| Waste Management | LDP (W1 Waste Hierarchy, W2 Waste Management Facilities and W5 Waste Management Plans and facilities in all new developments |

| | |
|---|---|
| Historic and Cultural Heritage | Onshore Wind Energy SG DC7 Historic Environment, together with LDP policies HE1 Historic Environment, HE2 Listed Buildings, HE4 Archaeology, HE5 Gardens and Designed Landscapes and HE6 Trees and Woodlands |
| Landscape and Visual | Onshore Wind Energy SG DC1 Landscape and Visual Impact, together with LDP policies NH4 Local Designations and the overarching LDP policies that set out broad requirements for implementing sustainable development GP1 Sustainable Development, GP2 General Requirements for All Development and GP3 All Development: Layout and Design |

## 5.7 MONITORING

Monitoring of the effects of implementing the plan will be based on the performance of a set of key indicators (some illustrative examples are shown in Table 5.4). Monitoring will be undertaken by regimes currently in place for local authority infrastructure maintenance and also delivered by the environmental regulators.

SEPA will continue to monitor water quality and would report back to Shetland Islands Council if wind energy developments appear to be contributing to increased pollution.

SNH has a responsibility to monitor and report on the condition of SSSIs and has a similar regime in place for monitoring the status of sites designated under the Habitats Directive, including Special Protection Areas (SPAs) and Special Areas for Conservation (SACs). Locally designated sites are the responsibility of local authorities (in this case Shetland Islands Council), and existing programmes for maintaining the condition of such sites will continue throughout the implementation and adoption of the Onshore Wind Energy SG.

Monitoring will therefore rely on the continued day-to-day management and site knowledge of those managing land for which they have responsibility, and the ongoing activities of the environmental regulators.

**Table 5.4 Key Indicators**

| SEA Topic | Objective | Example Indicators (to be developed) |
|---|---|---|
| **Biodiversity (Flora and Fauna)** | 1. To further the conservation of biodiversity | • Number of measures included in planning applications which would benefit biodiversity in short-term and on restoration<br>• Number of proposals that have the potential to significantly affect bird populations at a regional level. |
| **Population** | 2. To improve the quality of life for people and communities across Shetland | • Number of applications where visual intrusion, nuisance, community severance, etc is an issue |
| **Human Health** | 3. To improve the quality of health in Shetland | • Number of complaints regarding traffic and/or dust and emissions from construction or specific developments |

| | | |
|---|---|---|
| **Soil** | 4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner | • Number of applications in blanket bog, high quality heath or improved agricultural land |
| **Water** | 5. To protect and enhance freshwater and marine water quality<br>6. To ensure that Shetland's water resources are used effectively and sustainably | • Number of surface water bodies affected by wind energy development applications<br>• Water quality (marine and fresh water) |
| **Air** | 7. To protect Shetland's air quality | • As objective 3 |
| **Climatic Factors** | 8. To reduce greenhouse gas emissions and to contribute to Scotland's 80% $CO_2$ reduction target<br>9. To adapt to the predicted effects of climate change | • Distance travelled by vehicles accessing new wind farm developments<br>• Volume of construction/fabrication materials imported from outside Shetland<br>• Number of applications outwith areas of flood risk |
| **Material Assets** | 10. To promote the sustainable use of Shetland's natural resources | • Percentage of recycled materials used in new wind farm developments<br>• Area of agricultural/crofting land lost to wind energy development |
| **Cultural Heritage** | 11. To conserve and protect the historic environment<br>12. To conserve and promote the distinctive cultural heritage | • Number of development applications affecting historic sites and scheduled monuments (directly and indirectly i.e. effects on setting)<br>• Number of development sites consented which significantly impact on the setting of listed buildings, historic sites and scheduled monuments<br>• Number of development sites refused which significantly impact on the setting of listed buildings, historic sites and scheduled monuments |
| **Landscape** | 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes<br>14. To improve those landscapes and seascapes that are degraded | • Number of applications affecting National Scenic Areas and/or areas of recognised local landscape value<br>• Number of applications significantly affecting all landscapes, especially unique coastal landscape and seascape<br>• Number of applications approved that incorporate measures to improve degraded landscapes |

# 6 NEXT STEPS

## 6.1 PROPOSED STAGES

The following stages in the development of the Onshore Wind Energy SG and its environmental assessment are envisaged:

- The Environmental Report, which reported the findings of the SEA of the Wind Energy Development IPP was published for consultation alongside the Wind Energy Development IPP during 2010 for 8 weeks.
- Following consultation on the Wind Energy IPP and the Environmental Report, the Wind Energy IPP was revised and updated taking account of the comments received.
- The Onshore Wind Energy SG has now been prepared in response to the consultations that the Council undertook on the Wind Energy IPP and, following extensive consultation on further drafts of the Onshore Wind Energy SG, that SG has now been finalised and Shetland Islands Council has approved it for adoption.
- This SEA is updated for the legislation, terminology data and other matters that have changed during the preparation of the current Onshore Wind Energy SG and will be published alongside an SEA Statement that will be made available to the Consultation Authorities and the public, setting out how the findings of consultation and the environmental assessment have been incorporated into the development of the Onshore Wind Energy SGIPP.

# 7 COMMENTS

Any queries on the SEA of the Onshore Wind Energy SG should be addressed to:

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Annex A

SEA Appraisal of the Onshore Wind Energy SG

# A1 Introduction

This annex reports the screening undertaken of the policies within Onshore Wind Energy SG against the various SEA Objectives.

A screening system was developed and used based on the following scale of effects.

**Table A1 Assessment Key**

| | |
|---|---|
| Clear contribution to the SEA objective, very positive | √√ |
| Broadly supportive | √ |
| Neutral, no discernible effect | **0** |
| Negative effect, incompatible | X |
| Very negative effect | XX |
| Uncertain effect | **?** |
| Positive and negative effects | X√ |

The screening is summarised in the following table which lists the policies and presents the findings of the screening in relation to each of the SEA Objectives.

To carry out the screening process, a set of questions based on key criteria that relate to the SEA Objectives was established to aid in the decision making process for assessing whether the policies would impact on the SEA Objective. The questions are summarised in the following table.

**Table A2 SEA Appraisal Framework**

| SEA Topic | SEA Objectives | SEA Questions |
|---|---|---|
| **Biodiversity (Flora and Fauna)** | 1. To further the conservation of biodiversity | • Does it impact on plants and animals?<br>• Does it conserve and protect biodiversity?<br>• Does it contribute to the aims of the Local Biodiversity Action Plan?<br>• Does it contribute to public awareness and understanding about biodiversity? |
| **Population** | 2. To improve the quality of life for people and communities across Shetland | • Does it contribute towards improving quality of life for people and communities across Shetland? |
| **Human Health** | 3. To improve the quality of health in Shetland | • Does it contribute towards improving the quality of health associated with the environment (Air quality, water quality, noise and vibration)?<br>• Does it contribute to the goal of creating active, healthy lifestyles for Shetland islanders?<br>• Does it contribute towards improving access to health and care services for all Shetland islanders? |
| **Soil** | 4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner | • Does it protect Shetland's peat, soils and geological resources?<br>• Does it encourage the use of them only in a sustainable manner? |
| **Water** | 5. To protect and enhance freshwater and marine water quality<br><br>6. To ensure that Shetland's water resources are used effectively and sustainably | • Does it protect and enhance freshwater and marine water quality?<br>• Does it ensure that Shetland's water resources are used effectively and sustainably?<br>• Does it protect the integrity of the physical aspect of the water environment?<br>• Does it promote a sustainable drainage infrastructure? |
| **Air** | 7. To protect Shetland's air quality | • Does it pose any risks to air quality?<br>• Does it encourage activities that could contribute to lowering air quality? |
| **Climatic Factors** | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO^2$ reduction target | • Does it help in reducing greenhouse gas emissions?<br>• Does it take account of the predicted effects of climate change, and adapt appropriately? |

| SEA Topic | SEA Objectives | SEA Questions |
|---|---|---|
| | 9. To adapt to the predicted effects of climate change | • Is the risk or likelihood of flooding of any property, planned or existing, increased?<br>• Will it put other assets at risk from flooding?<br>• Will it ensure that people and property are protected from flooding? |
| **Material Assets** | 10. To promote the sustainable use of Shetland's natural resources | • Does the plan or programme encourage the sustainable use of natural resources?<br>• Will it lead to a reduction in the use of natural resources?<br>• Does it encourage the use of local or imported materials?<br>• Will it promote or enable greater use of recycling? |
| **Cultural Heritage** | 11. To conserve and protect the historic environment<br><br>12. To conserve and promote the distinctive cultural heritage | • Does it impact on the historic environment?<br>• Does it conserve and protect the historic environment?<br>• Does it help in raising public awareness and understanding of cultural heritage and how the public influence the continuing development of cultural heritage?<br>• Does it conserve and enhance cherished aspects of local cultural heritage?<br>• Does it contribute to local character, customs and traditions?<br>• Will it affect the setting of any listed buildings, historic sites or culturally important sites? |
| **Landscape** | 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes<br><br>14. To improve those landscapes and seascapes that are degraded | • Does it consider all landscape and seascape implications?<br>• Does it contribute to landscape and seascape protection?<br>• Does it enhance degraded landscapes and seascapes? |

**Table A3 SEA Appraisal of Onshore Wind Energy SG Policies**

| SG Policy | SEA Objective | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1. To further the conservation of biodiversity | 2. To improve the quality of life for people and communities across Shetland | 3. To improve the quality of health in Shetland | 4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner | 5. To protect and enhance freshwater and marine water quality | 6. To ensure that Shetland's water resources are used effectively and sustainably | 7. To protect Shetland's air quality | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO^2$ reduction target | 9. To adapt to the predicted effects of climate change | 10. To promote the sustainable use of Shetland's natural resources | 11. To conserve and protect the historic environment | 12. To conserve and promote the distinctive cultural heritage | 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes | 14. To improve those landscapes and seascapes that are degraded |
| LDP RE1 Renewable Energy | √ | 0 | 0 | √ | √ | √ | 0 | √ | 0 | √ | √ | √ | √ | 0 |
| | This policy and related guidance supports and facilitates the alternative generation of energy whilst contributing to the sustainable development of Shetland and safeguarding its unique natural and historic environment.<br><br>Renewable energy developments can provide a sustainable opportunity for diversification within the Shetland economy but proposals must show no unacceptable impacts on people (benefits and disbenefits for communities and tourism and recreation interests) the natural and water environment, landscape, historic environment and the built environment and cultural heritage of Shetland.<br><br>This policy states that development will also be considered against the Spatial Framework Development Criteria set out in the SG, so the success of this policy in mitigating the effects of onshore development rests on the success of the suite of policies together. However, it is broadly supportive or neutral in respect of the SEA Objectives. | | | | | | | | | | | | | |

| SG Policy | SEA Objective | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1. To further the conservation of biodiversity | 2. To improve the quality of life for people and communities across Shetland | 3. To improve the quality of health in Shetland | 4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner | 5. To protect and enhance freshwater and marine water quality | 6. To ensure that Shetland's water resources are used effectively and sustainably | 7. To protect Shetland's air quality | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO^2$ reduction target | 9. To adapt to the predicted effects of climate change | 10. To promote the sustainable use of Shetland's natural resources | 11. To conserve and protect the historic environment | 12. To conserve and promote the distinctive cultural heritage | 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes | 14. To improve those landscapes and seascapes that are degraded |
| Onshore Wind Energy SG Spatial Framework<br><br>Group 1: Areas where wind farms will not be acceptable | **0** | **0** | **0** | | **0** | **0** | **0** | **0** | **0** | √ | **0** | **0** | √ | **0** |
| | This policy repeats Scottish Planning Policy, which states that wind farms are unacceptable within National Parks and National Scenic Areas. Map 1 identifies the National Scenic Area designation for Shetland. By doing this the policy asserts the strongest, most basic level of protection for those areas which are designated as such.<br><br>This policy therefore has a broadly neutral effect on most SEA objectives except those concerned with protecting natural heritage and environmental assets, where it is broadly supportive. | | | | | | | | | | | | | |
| Onshore Wind Energy SG Spatial Framework<br><br>Group 2: Areas of significant protection. | √ | **0** | **0** | √ | **0** | **0** | **0** | **0** | **0** | √ | **0** | **0** | √ | **0** |
| | This policy affords significant protection against wind energy development to certain sites of environmental sensitivity (as represented in the accompanying Map 2) and specifies that significant effects must be overcome by siting, design or other mitigation. By doing this the policy asserts the strongest, most basic level of protection for those areas which are nationally or internationally designated.<br><br>This policy therefore sets the baseline onto which the Development Criteria can be layered. As such it has a broadly neutral effect on most SEA objectives except those concerned with protecting natural heritage and environmental assets, where it is broadly supportive. | | | | | | | | | | | | | |

| SG Policy | SEA Objective | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1. To further the conservation of biodiversity | 2. To improve the quality of life for people and communities across Shetland | 3. To improve the quality of health in Shetland | 4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner | 5. To protect and enhance freshwater and marine water quality | 6. To ensure that Shetland's water resources are used effectively and sustainably | 7. To protect Shetland's air quality | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO^2$ reduction target | 9. To adapt to the predicted effects of climate change | 10. To promote the sustainable use of Shetland's natural resources | 11. To conserve and protect the historic environment | 12. To conserve and promote the distinctive cultural heritage | 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes | 14. To improve those landscapes and seascapes that are degraded |
| Onshore Wind Energy SG Spatial Framework<br><br>Group 3: Areas with potential for wind farm development | √ | √ | √ | **0** | **0** | **0** | **0** | √ | **0** | √ | **0** | **0** | √ | √ |
| Areas out with groups 1 and 2 areas are considered to be capable, in principle, subject to compliance with local safeguarding of supporting large scale wind energy developments within Shetland. Proposals for wind energy developments within these areas must satisfy the development criteria set out in Section 2 of the SG. Any application for wind energy developments will be required to meet all applicable Local Development Plan policies and relevant National and International guidance.<br><br>Robust policy supporting sustainable energy projects that will have broadly positive impacts on social and environmental topics. There is the possibility for negative landscape impact but application of the policy and Development Criteria will minimise these. | | | | | | | | | | | | | | |

| SG Development Criteria | SEA Objective | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1. To further the conservation of biodiversity | 2. To improve the quality of life for people and communities across Shetland | 3. To improve the quality of health in Shetland | 4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner | 5. To protect and enhance freshwater and marine water quality | 6. To ensure that Shetland's water resources are used effectively and sustainably | 7. To protect Shetland's air quality | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO^2$ reduction target | 9. To adapt to the predicted effects of climate change | 10. To promote the sustainable use of Shetland's natural resources | 11. To conserve and protect the historic environment | 12. To conserve and promote the distinctive cultural heritage | 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes | 14. To improve those landscapes and seascapes that are degraded |
| DC1 Landscape and Visual Impact | **0** | **√** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **√** | **√√** | **0** |
| | This criterion focuses on minimising landscape and visual impacts and will therefore have strong positive effects on the objectives relating to landscape. It will have broadly neutral effects on other objectives. | | | | | | | | | | | | | |
| DC2 Cumulative Impact | **√√** | **√√** | **√** | **√√** | **0** | **0** | **0** | **0** | **0** | **√** | **√√** | **√√** | **√√** | **0** |
| | This criterion expects developers to demonstrate that proposals will not result in unacceptable cumulative impacts. In addition to DC1 Landscape and Visual Impact Assessment, developers will be asked to take into account a wide range of cumulative factors including the natural, historic and built environment, the visual amenity of residents and wider socio-economic impacts. It therefore has positive or strong positive effects on the associated criteria and broadly neutral effect on all others | | | | | | | | | | | | | |
| DC3 Natural Heritage . | **√√** | **0** | **0** | **√√** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **√** | **0** |
| | This criterion will have broadly neutral effects on the majority of SEA objectives but will have strong positive effects for the conservation of biodiversity, soils, peat and geodiversity. | | | | | | | | | | | | | |
| DC4 Impacts on communities | **0** | **√√** | **√** | **0** | **0** | **0** | **0** | **0** | **?** | **0** | **0** | **0** | **0** | **0** |
| | This criterion ensures that development proposals must, in combination with existing and consented wind energy developments, assess the likely impact on communities and the long term impacts on amenity including outdoor access, recreation and tourism opportunities. This includes an assessment of effects on visual amenity, noise, shadow flicker, electromagnetic interference, designated sites, road safety and construction/ decommissioning logistics, impacts on access routes and recreation interests, phasing and any other identifiable significant effects<br><br>The policy will therefore support the population and health related SEA objectives and be broadly neutral for others though impacts in respect of adaptation to climate change effects are uncertain.. | | | | | | | | | | | | | |

| SG Development Criteria | SEA Objective | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1. To further the conservation of biodiversity | 2. To improve the quality of life for people and communities across Shetland | 3. To improve the quality of health in Shetland | 4. To protect Shetland's peat, soils and geological resources and use them in a sustainable manner | 5. To protect and enhance freshwater and marine water quality | 6. To ensure that Shetland's water resources are used effectively and sustainably | 7. To protect Shetland's air quality | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO^2$ reduction target | 9. To adapt to the predicted effects of climate change | 10. To promote the sustainable use of Shetland's natural resources | 11. To conserve and protect the historic environment | 12. To conserve and promote the distinctive cultural heritage | 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes | 14. To improve those landscapes and seascapes that are degraded |
| DC5 Water Resources | **0** | **0** | **0** | **0** | √ | √ | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| | This criterion will prevent wind energy developments from being sited where they would have a significantly adverse effect on groundwater, surface water and water supplies. It is broadly neutral in impact on most of the SEA objectives but is supportive of those that seek to protect and enhance Shetland's water environment and the sustainable use of water. | | | | | | | | | | | | | |
| DC6 Decommissioning | **0** | **0** | **0** | **0** | √ | √ | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| | This criterion will ensure proposals for onshore wind energy developments and associated infrastructure are accompanied by a decommissioning statement detailing the method of reinstatement of all land affected by the development to its original condition and the removal of all turbines, ancillary buildings and related plant.<br><br>The policy is broadly neutral in impact on most of the SEA objectives but is supportive of those that seek to protect and enhance Shetland's water environment and the sustainable use of water. | | | | | | | | | | | | | |
| DC7 Historic Environment | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | √√ | √√ | √ | **0** |
| | The criterion has broadly neutral effects on the majority of the SEA objectives but has clear support for the historic environment and those objectives conserving and promoting the cultural heritage of Shetland. | | | | | | | | | | | | | |

**Annex B**

Summary of Statutory Consultee Responses

**Table C1 Summary of Statutory Consultee Responses**

| Consultee | Contact | Date | Information/Comments | Response/Comments |
|---|---|---|---|---|
| Historic Scotland | Andrew Stevenson | 19.08.09 | **Summary of Representative Plans, Programmes and Strategies (PPS) relevant to the Wind Energy Development IPP**<br><br>Historic Scotland (HS) note that this section sets out the relationship of the SPG to wider scale environmental protection/enhancement policies and objectives. HS note the inclusion of NPPG 5 and 18 but draw attention to the recent changes in the policy background outlined below.<br>• Scottish Planning Policy 23: Planning and the Historic Environment (SPP 23): This SPP supersedes and consolidates National Planning Policy Guidelines – NPPG 18: Planning and the Historic Environment and NPPG 5: Archaeology and Planning. It sets out the national planning policy for the historic environment and indicates how the planning system will contribute towards the delivery of Scottish Ministers' policies as set out in the current Scottish Historic Environment Policy (see below).<br>• Scottish Historic Environment Policy (SHEP): This outlines Scottish Minister's policies on the Historic Environment and is produced by Historic Scotland and available at http://www.historic-scotland.gov.uk/shep-july-2009.pdf<br><br>In summary, the key environmental protection objective of the legislation and policy framework is 'to protect and, where appropriate, enhance the historic environment'.<br>HS records indicate the following number of listed buildings in the Shetland Islands planning authority area:<br><br>Category A 13<br>Category B 173<br>Category C(S) 158<br>Gardens and Designed Landscapes should also be included in this baseline. HS noted there are 4 such sites from the Inventory of Gardens and Designed Landscapes in Scotland that can be found in the Shetland Islands. They are;<br>• Belmont House<br>• Brough Lodge<br>• Lunna House<br>• Gardie House<br>Noted a key issue for wind energy development in relation to the historic | Noted, these documents have now been included in the review of plans, programmes and strategies and have been taken into consideration throughout the assessment.<br><br>Baseline information has been updated accordingly.<br><br>Baseline information has been updated accordingly.<br><br>Noted |

| Consultee | Contact | Date | Information/Comments | Response/Comments |
|---|---|---|---|---|
| | | | environment is the potential impact on the setting of archaeological sites, scheduled monuments, gardens and designed landscapes and listed buildings. HS welcome the inclusion of the SEA objectives and the specific questions for the historic environment.<br>HS note the scoping report considers that there are no alternative plans to the WED IPP but that alternative objectives and policies have been considered during its evolution. Stated it would be helpful for this process to be fully documented within the environmental report.<br>HS note that indicators are proposed to aid in the monitoring of the effects of the plan and HS welcome those included for the historic environment. The second indicator may need to be refined in order to clarify the purpose of this indicator. For example,<br>• Number of development sites consented which significantly impact on the setting of listed buildings, historic sites and scheduled monuments<br>• Number of development sites refused which significantly impact on the setting of listed buildings, historic sites and scheduled monuments | Noted, this process has been further detailed in section 5.2 of the Environmental Report<br>These suggested indicators have now been included in the monitoring section of the Environmental report (Section 5.7) |
| SEPA | Susan Haslan | 18.08.09 | • Environmental Baseline<br>• We are finding that the generation of waste materials, specifically waste peat and overburden, is a specific problem associated with windfarm applications in rural areas. In view of this it would be valuable for the baseline section on soils and geology to specifically provide the information available on the localities of deep peat. The Soil Survey of Scotland 1:250000 Soil Map would provide information on generic soil types for the islands and this, accompanied by local knowledge, could be used to identify areas where deep peat and overburden are likely to be encountered (and from a plan-making view-point these areas should be avoided). | Mitigation measures to protect deep peat included in the IPP and text within the plan states:<br>*"An indicative map showing peat depth is available, and applicants should consult this at an early stage of the design of their proposal"*<br>However, due to data licensing issues this map has not been directly included in the Plan or the SEA.<br>The SEA Environmental Report has therefore simply signposted this information and |

| Consultee | Contact | Date | Information/Comments | Response/Comments |
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| | | | | highlighted the requirement for potential developers to take account of it. |
| | | | • Plan Alternatives<br>• 2.1 We note that there are no alternatives to reviewing the policies; this is accepted.<br>• 2.2 We also note that different possible objectives and policies are being developed; we would expect these to be assessed as these represent reasonable alternatives. | Noted, this process has been further detailed in section 5.2 of the Environmental Report |
| | | | • We welcome the inclusion of a sample assessment matrix in the scoping report, considering this good practice. The assessment table presents an assessment of residual effects after mitigation has been applied where as the Act requires the identification of likely significant effect on the environment, and then what mitigation is proposed to prevent, reduce and as fully as possible offset any significant adverse effects. We therefore request that it be amended with this in mind | The assessment matrix used has been revised and now appears as shown in Table 2.5 of the Environmental Report |
| | | | • Notwithstanding the above we also welcome the direct linking of affects with mitigation measures. One of the most important mitigation measures to consider in the report is the way in which the policies have been modified as a result on the environmental assessment process. It would be useful if the ER made it clear how carrying out the assessment had impacted upon the policies being consulted upon | Agreed, various suggestions and word changes to policies *have* been made in the SEA and the difference made by this is covered in section 5.2 of the Environmental Report. |
| | | | • We would expect enough information to be provided in the comments column to understand the assessments presented. Generally when carrying out the assessment please refer to sections 6.3.7 to 6.3.3.12 of the Scottish Government SEA Toolkit which outlines the proposed coverage of the issues expected | Noted |
| **SNH** | Graham Neville<br>Operations North Manager,<br>Ground Floor<br>Stewart Building<br>Alexandra Wharf<br>Lerwick<br>Shetland | 18.08.09 | • Subject to the detailed comments in Annex 1, SNH is content with the scope and level of detail proposed for the environmental report. | Noted |

| Consultee | Contact | Date | Information/Comments | Response/Comments |
|---|---|---|---|---|
| | ZE1 0LL<br>northern_isles@snh.gov.uk<br>01595 693345 | | | |
| | | | • The Wildlife and Countryside Act 1981 is the principal legislation dealing with nature conservation in Britain and should be considered along with the strategies and plans relevant to the Design and Construction IPP set out in Table 2.1. The Shetland Woodland Strategy published in 2002 by Shetland Amenity Trust to guide the conservation of Shetland's native trees and woodland planting may also be relevant under Local strategies | This has been amended accordingly in the Environmental Report and the relevant annex and has been taken into account throughout the assessment. |
| | | | • Table 2.2. and 2.3, listing respectively the designated features of Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) in Shetland contain a number of inaccuracies and omissions:<br>• As great skuas are ground-nesting birds, the description of Noss SPA should read "Cliffs and moorland supporting internationally breeding populations.." The qualifying features of the SPA include puffin as well as the listed species and the seabird colony as a whole.<br>• Black guillemot and red-throated diver are not qualifying species for Fetlar SPA, however dunlin and great skua are.<br>• Hermaness and Saxa Vord SPA was enlarged in 2001 and renamed Hermaness, Saxa Vord and Valla Field SPA. Its qualifying interests include shag and red-throated diver as well as the species listed.<br>• Qualifying interests on Fair Isle SPA include Artic tern, gannet and razorbill in addition to the listed species. The importance of Fair Isle as a bird migration landfall is not relevant to the SPA as the site is designated solely for its breeding bird populations.<br>• On Foula SPA, Arctic tern, kittiwake, Leach's petrel and red- throated diver are qualifying interests in addition to the species listed. All the qualifying species are of international, rather than just national importance. | These various observations have now been incorporated to the environmental baseline section of the Environmental Report. |

| Consultee | Contact | Date | Information/Comments | Response/Comments |
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| | | | • Qualifying interests on Sumburgh Head SPA include fulmar, guillemot and kittiwake and the seabird colony as a whole, as well as Arctic tern.<br>• Neither Arctic skua nor whimbrel is a qualifying feature of Ronas Hill – North Roe and Tingon SPA.<br>• Papa Stour SPA does not qualify for its seabird colony; only for Arctic skua and ringed plover populations, both of which are internationally important.<br>• The nature of the vegetation on Otterswick and Graveland is not relevant to the SPA designation.<br>• Keen of Hamar SAC is designated for its dry heathland as well as base rich scree and calaminarian grassland.<br>• On Ronas Hill – North Roe, red-throated divers are not relevant to the SAC designation, however the dystrophic (peat-stained) pools and lochans on which they nest, and the oligotrophic lochs on the site constitute designated features in their own right. Acid scree is also a designated feature of the site.<br>• The qualifying features of Mousa SAC include reefs and sea caves as well as common seal.<br>• Common seal is also a qualifying feature of Yell Sound Coast SAC | |
| | | | • Table 2.4 is entitled “List of SSSIs in Shetland” but is in fact a summary of the notified features of SSSIs in Shetland. Many sites have more than one notified feature, hence the total number of features is greater than the number of SSSIs in Shetland<br>• The four RSPB reserves listed on page 13 are those that are publicised and promoted to visitors. There are several others which are not publicised because of the sensitivity of the bird species that they support. These sites are generally not covered by statutory designations but, because of the rarity and sensitivity of the species that they support, should be considered by the SEA. Details of the reserves can be obtained from the RSPB Shetland office.<br>• Table 2.6 (Page 14) shows the area of Shetland covered by each designation. It should be noted that all NNRs and Ramsar sites and | These various observations have now been incorporated to the environmental baseline section of the Environmental Report |

| Consultee | Contact | Date | Information/Comments | Response/Comments |
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| | | | the terrestrial parts of most SPAs and SACs are also notified as SSSIs. The total land coverage of designated areas in Shetland is therefore only slightly greater than the area of SSSIs | |
| | | | • Under "Designated Species" on page 14, the report states that some cetaceans (whales and dolphins) are European Protected Species (EPS). In fact all cetaceans are afforded this protection, however, as marine species these do not need to be considered here. The only other EPS occurring in Shetland is the otter, so reference to wildcats, great crested newts and bats is not relevant.<br>• None of the species listed in the report as being protected under the Wildlife and Countryside Act 1981 which do occur in Shetland are as follows: Schedule 1 (breeding birds): Red-throated diver, black tailed godwit, greenshank, merlin, perergrine, leach's petrel, red-necked phalarope, whooper swan, whimbrel. Schedule 5 (other animals): Cetaceans, otter, freshwater pearl mussel. Schedule 8 (plants): Norwegian sandwort, weak-leaved hawkweed, north roe hawkweed, and Shetland hawkweed.<br>• Under "Priority Habitats and Species" on page 14, the report lists habitats and species identified in the draft Shetland Local Biodiversity Action Plan (LBAP) but makes no reference to the UK Biodiversity Action Plan (UKBAP) or the Scottish Biodiversity Strategy (SBS). The Nature Conservation (Scotland) Act 2004 places an obligation on all public bodies to further the conservation of biodiversity, particularly in respect of habitats and species listed in the SBS. The Scottish Biodiversity List includes many species and habitats, both terrestrial and marine, which occur in Shetland and which should therefore be addressed in this SEA.<br>• The statement about trees under "Vegetation" on page 17 is true only in respect of the small areas of woodland planted over the past century and a half. Although these are the most visible trees in Shetland, they are mainly composed of non-native species. A large number of relict native trees also exist, particularly in the north, west and central Mainland. These are generally small and occur singly or occasionally in small groups, often in exposed situations, on cliff ledges, in ravines and on holms in lochs which are inaccessible to | These various observations have now been incorporated to the environmental baseline section of the Environmental Report |

| Consultee | Contact | Date | Information/Comments | Response/Comments |
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| | | | grazing animals | |
| | | | • Schedule 2 of the Environmental Assessment (Scotland) Act 2005 requires the environmental report to identify "environmental problems relevant to the plan or programme". In a number of instances it is not clear how the issues identified in Section 2.4 – Current Environmental Issues – are relevant to the IPP. We also question the accuracy of some of the statements and suggest other issues that should be included | Noted, see comments below for specific points |
| | | | • With respect to the first issue identified under "Biodiversity, flora and fauna", the great majority of designated sites in Shetland are in remote upland or coastal area where there is little evidence of development pressure. In low lying areas where there might otherwise be potential for development, designated sites are generally small and make up a miniscule proportion of the land area. The statement that "the abundance of nationally and internationally designated conservation sites in and around the Shetland Islands restricts the amount of available land and so places a strain on development" is therefore questionable | This statement has been amended to reflect these comments. |
| | | | • The second statement is also incorrect: Seabirds nesting within SPAs are dependent on sea areas out with the sites, but not generally on surrounding land, however raptors, wading birds and otters, all of which are dependent on areas out with the sites that are designated for them may be particularly sensitive to development as a result | This statement has been amended to reflect these comments. |
| | | | • We would identify a further environmental issue with respect to birds; that a number moorland breeding species occur in Shetland at much higher densities than elsewhere in Britain. These include golden plover and red-throated diver, both of which are on Annex 1 of the Birds directive, whimbrel, of which Shetland holds 9 % of the GB population and great skua, of which Shetland has 43% of the GB population. The potential for wind energy developments to adversely affect regional and national populations of these species is likely to be a constraint on such developments. | This point has been incorporated into the SEA as an environmental issue, as shown in section 4.3.1, and has been considered throughout the SEA appraisal |
| | | | • With respect to the second issue identified under "Soils and Geology", it should be noted that blanket bog is an important and | This is an important point and has been |

| Consultee | Contact | Date | Information/Comments | Response/Comments |
|---|---|---|---|---|
| | | | internationally rare habitat and also provides a significant sink for carbon dioxide. Active blanket bog is a priority habitat under the Habitats Directive and the UK Biodiversity Action Plan. Destabilisation of peat therefore has implications for biodiversity and climate change as well as for soil and geological resources, water quality, flooding and the safety of property. | included in this issue and has been considered throughout the SEA appraisal. |
| | | | • Whilst it is true that in the past there was pressure for agricultural improvement in Shetland, as stated at bullet point 3, this was largely as a result of agricultural subsidies, and recent changes in agricultural support mechanisms mean that this is no longer the case. In any case, it is not clear how this issue relates to the SIC Wind Energy Development policy | This issue has been altered, in accordance with this comment, but left in, in recognition of the role agriculture has to play in Shetlands economy. |
| | | | • In section 3.3.2, the meaning of paragraphs 2 and 3 is unclear. | These paragraphs have not been carried through to the Environmental Report. The establishment of indicators is dealt with in Section 5.7 of the Environmental report. |
| | | | • We would suggest that an appropriate Biodiversity indicator would be the number of proposals that have the potential to significantly affect bird populations at a regional level. | This indicator has been included in Table 5.4 of the Environmental Report. |

**Annex C**

SEA Scoping Report

# Shetland Islands Council

## Interim Planning Policy: Wind Energy Development

# SEA Scoping Report

## July 2009

natural CAPITAL

**Scoping Report**

Shetland Islands Council

# Strategic Environmental Assessment (SEA): Scoping Report for Shetland Islands Council Interim Planning Policy: Wind Energy Development

**July 2009**

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**Scoping Report**

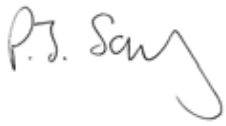
Shetland Islands Council

# Strategic Environmental Assessment (SEA): Scoping Report for Shetland Islands Council Interim Planning Policy: Wind Energy Development

For and on behalf of
Natural Capital Ltd.

Approved by: Dr Phil Say

Signed:



Position: Director

Date: 16th July 2009

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**ANNEX A: BIBLIOGRAPHY**

# 1 INTRODUCTION

## 1.1 BACKGROUND TO INTERIM PLANNING POLICY: WIND ENERGY DEVELOPMENT

The current Shetland Structure Plan (2001) was based on information gathered during the late 1990s. If a new Local Development Plan is to provide sound and comprehensive policies for development leading into the next decade, and in particular renewable energy, it is imperative that it is based on up-to-date information and legislation. Work commenced during 2007 and 2008 on a number of topic areas, including renewable energy developments as national policy or changes to local objectives indicated a review was required.

The Shetland Islands Council Corporate Plan[1] seeks to support the development of a large wind farm on Shetland, which will contribute to the national target of energy generated from renewable sources, increase the local skills base, and provide a security of income in the face of a declining oil industry. Alongside this there is strong support for community generation schemes, including those for energy security in remote communities, wind-to-heat schemes for community facilities, energy supply for district heating schemes, and householder projects.

Shetland Islands Council has adopted planning policy in the past to support renewable energy developments in principle, and this was detailed in planning policies both within the Structure Plan and also the Local Plan of 2004.

This current interim planning policy document seeks to refine the scope of relevant Structure Plan policy and revisit the Local Plan policies that are applicable to the consideration of proposals for wind energy development within Shetland, to ensure the development plan is compliant with SPP6[2]. It gives detailed advice as to how development proposals will be assessed, and as such supports the policies in the current development plan.

The IPP sets out:

- **The Planning Context:** This chapter sets out the planning context.
- **The Spatial Policies:** This chapter sets out the three spatial policies against which all proposals for wind energy development and any associated infrastructure will be initially assessed.
- **Development Plan Management:** This chapter sets out the development plan management process.
- **The Development Management Criteria:** This chapter presents a suite of criteria many of which are environmental.
- **Broad Area of Search Methodology:** It recognises that this will not to be used as a driver for a sequential approach to the siting of large scale windfarms. Similarly it emphasises that no area of Shetland is unconstrained and so no area of Shetland could be said to have a presumption in favour of large scale wind farm development. The Broad Area of Search will be used an indication of the areas of Shetland where it is considered that large scale windfarms could most easily be accommodated.

[1] The Shetland Islands Council Corporate Improvement Plan 2007-08, Shetland Islands Council
[2] Scottish Planning Policy SPP 6 Renewable Energy, Scottish Executive, 2007

**Box 1: Summary of Key Facts relating to the Wind Energy Development**

**IPP Name of Responsible Authority:** Shetland Islands Council

**Title of Plan/Programme:** Interim Planning Policy: Wind Energy Development in Shetland

**What prompted the Plan:** The Publication of Scottish Planning Policy 6 sends a clear message that there is the requirement to make positive prevision for renewable energy. In addition, the Shetland Islands Corporate Plan (2008) seeks to support the development of a large windfarm on Shetland, which will contribute to the national target of energy generated from renewable sources, increase the local skills base and provide a security of income in the face of a declining Oil industry.

**Plan Subject:** Wind Energy

**Period covered by Plan:** 2009 - 2014

**Frequency of Updates:** Every 5 Years

**Plan Area:** All areas of the Shetland Islands

**Plan Purpose/Objectives:** To provide guidance on location, design and policy for Wind energy Development within Shetland and off-shore areas for which it is responsible.

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## 1.2 THE STAGES IN THE SEA PROCESS

In line with the SEA process (as determined in the Environmental Assessment (Scotland) Act, 2005), Shetland Islands Council (SIC) undertook an internal screening exercise which established that the organisation would need to undertake a strategic environmental assessment of its WED IPP (WED IPP).

SIC recognised that the WED IPP and the resultant policies would be likely to have significant environmental effects because:

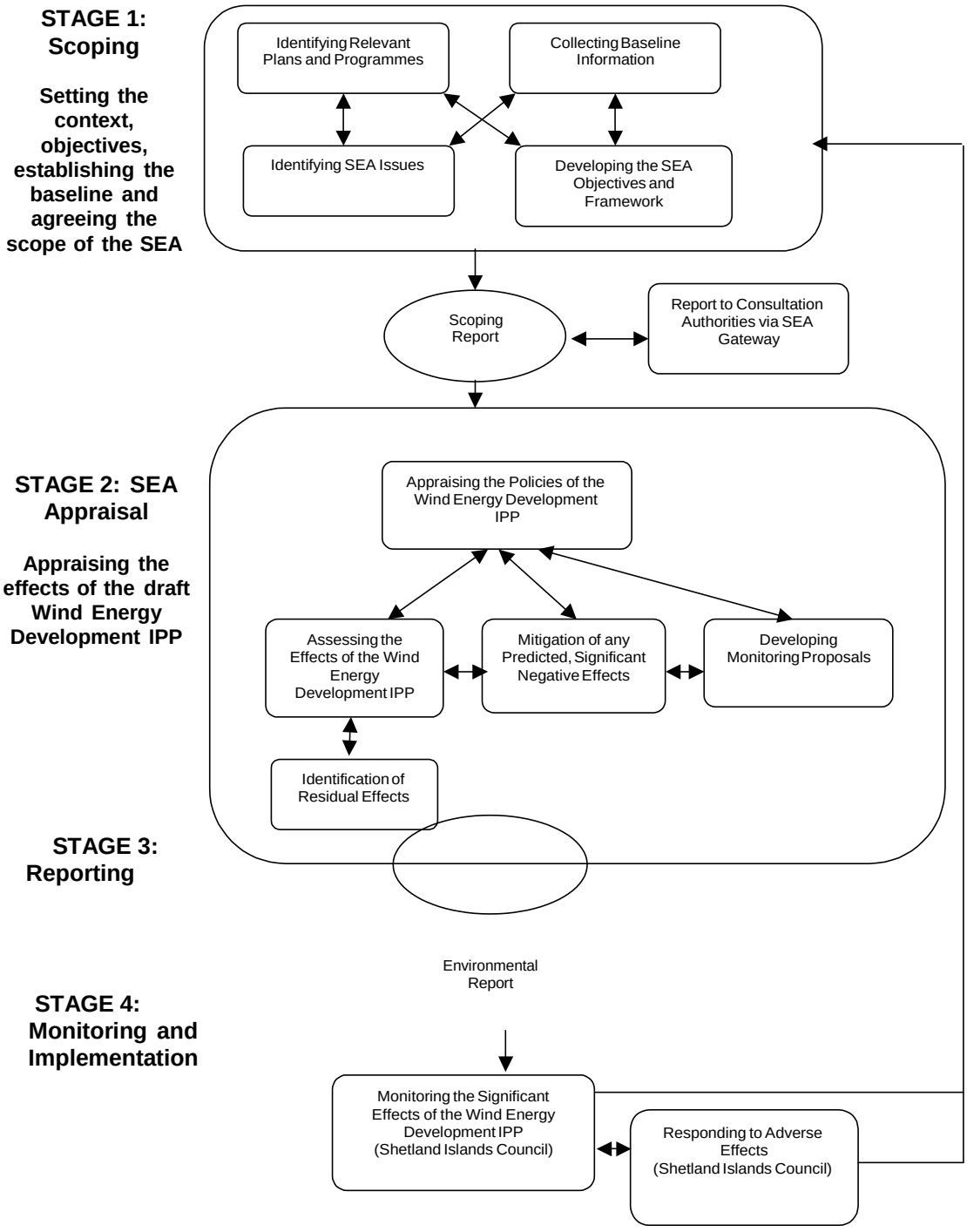
- the plan would set a policy framework for all subsequent projects and activities associated with WED IPP and the associated construction and design of new wind energy developments;
- there are a number of significant environmental issues associated with WED IPP;
- the potential environmental effects of WED IPP construction and design have been widely reported and documented;
- effects can lead to cumulative and transboundary effects;
- there can be risks to human health;
- the magnitude and spatial effects can be significant;
- Shetland has vulnerable natural and cultural heritage assets that could be affected.

SIC proposes to take the SEA process forward in six steps that are part of the formal SEA process illustrated in Figure 1 below:

- **Step 1:** the scoping exercise and associated report which is the focus of this document;
- **Step 2:** the SEA appraisal;
- **Step 3:** the production of an Environmental Report;
- **Step 4:** public consultation;
- **Step 5:** revision of the WED IPP and formal approval;
- **Step 6:** monitoring and Implementation.

Steps 2 and 3 will be undertaken following consultation on this scoping report (see Section 3).

**Figure 1: The Strategic Environmental Assessment Process: Stages for the Appraisal of SIC WED IPP**



## 1.3 STATUTORY FRAMEWORK

The Environmental Assessment (Scotland) Act 2005 is the statutory mechanism by which the requirements of the European Directive 2001/42/EC – *"On the assessment of the effects of certain plans and programmes on the environment"* (known as the Strategic Environmental Assessment or SEA Directive) are now delivered in Scotland. The purpose of the SEA Directive is twofold. Firstly it aims to provide for a high level of protection of the environment and secondly to contribute to the integration of environmental considerations into the preparation and adoption of plans with a view to promoting sustainable development (see Section 1.4 below).

SIC recognises that the WED IPP has the potential to generate significant environmental effects through its potential influence on the location, design and construction of any resultant wind energy developments. It is therefore appropriate that a high level suite of policies of this nature should be appraised so that any possible negative effects can be mitigated and the positive effects strengthened as far as is possible.

## 1.4 SUSTAINABLE DEVELOPMENT

Sustainable development can be defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'[3].

The UK Government launched a new sustainable development strategy in 2005[4] *"Securing the Future – delivering UK sustainable development strategy"* with a set of shared UK principles:

- *"Living within Environmental Limits"*
- *"Ensuring a Strong, Healthy and Just Society"*
- *"Achieving a Sustainable Economy"*
- *"Promoting Good Governance"*
- *"Using Sound Science Responsibly"*

In 2005, Scottish Ministers also set out their aims for sustainable development in a new strategy *"Choosing our Future – Scotland's Sustainable Development Strategy"*[5]. The main thrust of the strategy is enshrined in four key goals:

- *"The well being of Scotland's people"*
- *"Supporting thriving communities"*
- *"Scotland's global contribution"*
- *"Protecting Scotland's natural heritage and resources"*

There is a strong environmental strand within this strategy so testing SIC's WED against the requirements of the SEA Directive will make sure that SIC makes a contribution to each of these four goals and is effective in protecting the environment whilst providing direction on future wind energy development in Shetland.

[3] World Commission on Environment and Development 1987
[4] *"Securing the Future"* – Delivering the UK Sustainable Development Strategy, HM Government, 2005
[5] *"Choosing our Future* – Scotland's Sustainable Development Strategy", Scottish Executive, December 2005

## 1.5 THE SCOPING REPORT

The purpose of this SEA scoping report is to set out sufficient information on SIC's WED IPP to enable the Consultation Authorities to form a view on the consultation periods and scope/level of detail that will be appropriate for the accompanying environmental report. The report has been prepared in accordance with Regulation 15 of the Environmental Assessment (Scotland) Act 2005.

The document sets out the methodology to be followed for the SEA; summarises the baseline information and related plans and programmes which have been reviewed (to inform the assessment of key environmental issues and help in the development of objectives and indicators), and presents the draft proposed framework for the appraisal.

The following organisations are statutory consultees under the SEA Regulations:

- Historic Scotland;
- Scottish Natural Heritage (SNH); and
- the Scottish Environment Protection Agency (SEPA).

The scoping report is being distributed to these organisations for comment via the Scottish Government's SEA Gateway. All comments received will be taken into account and the methodology including the SEA appraisal framework will be amended as required.

## 1.6 LAYOUT OF THE REPORT

The remainder of the document is structured as follows:

- **Section 2**: describes the plan context, the links with other relevant plans and programmes, the environmental baseline and key environmental issues and sets out the SEA objectives;
- **Section 3**: sets out how the environmental assessment will be carried out and includes the assessment methodology; the appraisal framework; the establishment of the SEA indicators and the proposed structure of the Environmental Report.

The main text is supported by the following annexes:

- **Annex A:** Bibliography
- **Annex B:** Relevant Plans and Programmes Reviewed

# 2 PLAN CONTEXT

## 2.1 LINKS WITH OTHER RELEVANT PLANS, PROGRAMMES AND ENVIRONMENTAL OBJECTIVES

The WED IPP will have an influence on, and will draw from, other plans produced by Shetland Islands Council. Following analysis of the relevant plans, programmes and environmental protection objectives it is concluded that the Interim Planning Policy should emphasise the following:

- promotion of sustainable development;
- protection of the quality of life for local communities;
- protection of the natural and historic environment; and
- support for renewable energy.

An understanding of the relevance of other legislation, policy and plans to the WED IPP is an essential step in understanding its context and in deriving the necessary baseline for the assessment. A summary list of the policies, plans and programmes together with their environmental objectives relevant to the WED IPP are presented in Table 2.1 below. These were used to help formulate the SEA objectives in Table
2.2 and to shape the emerging indicators (see Table 3.6). Other plans and programmes, together with more details on the key environmental messages used to shape the SEA objectives, are given in Annex B.

**Table 2.1: Summary of Representative Plans, Programmes and Strategies (PPS) relevant to the Wind Energy Development IPP (see Annex B for more details)**

| Policy, Plan or Programme | Summary of Relevant Environmental Objectives and corresponding implications for the Wind Energy Development IPP |
|---|---|
| **National** | |
| Scottish Planning Policy: October 2008 | Protection and enhancement of the national and built environment – key policy direction |
| Biodiversity: The UK Action Plan (1994) | The plan assesses the current status of the UK's habitats and species and sets out a strategy for their future conservation and enhancement |
| Scottish Biodiversity Strategy: Scotland's Biodiversity, Its in Your Hands (2004) | To conserve Scotland's biodiversity for future generations |
| Nature Conservation (Scotland) Act (2004) | This Act puts in place legal measures for the conservation of biodiversity .The Act places a "Biodiversity Duty" on Shetland Islands Council |
| The UK Strategy for Sustainable Development "Securing the Future" (2005) | To ensure the effective protection of the environment, maintenance of economic growth, employment and prudent use of natural resources |
| UK Climate Change Programme (2006) | To reduce greenhouse gas emissions. The UK target is to cut emissions by 12.5% below 1990 levels by 2008-2012 |
| "Choosing Our Future": Scotland's Sustainable Development Strategy (2005) | Details the Scottish Government's strategy for tackling issues such as climate change, biodiversity, resource use and pollution |
| "Changing Our Ways" Scotland's Climate Change Programme (2006) | To make an equitable contribution to the UK commitment on climate change and enable Scotland to make the transition to a low carbon economy |
| Climate Change (Scotland) Bill (2009) | Sets a $CO_2$ reduction target for the year 2050, an interim target for the year 2020, and makes provisions for annual targets, for the reduction of greenhouse gas emissions; confers power on Ministers to impose climate change duties on public bodies and to make further provision with |

| Policy, Plan or Programme | Summary of Relevant Environmental Objectives and corresponding implications for the Wind Energy Development IPP |
|---|---|
| | regard to mitigation of and adaptation to climate change |
| Water Environment and Water Services (Scotland) Act 2003 | Ensures that all human activity that can have a harmful impact on water is controlled |
| Environment Protection Act 1990 | This Act relates to the control of pollution and protection of the natural environment |
| Water Environment (Controlled Activities) (Scotland) Regulations 2005 | Requires authorization over point source discharges, abstractions, impoundments and engineering activities |
| The Air Quality Limit Values (Scotland) Regulations 2005 | Limits values of relevant pollutants in ambient air which must be complied with |
| SPP3 : Planning for Housing (2003) | Promotion of clear guidance to encourage good quality well designed development which makes a significant contribution to environmental quality |
| SPP6 : Renewable Energy (2007) | Delivery of renewable energy targets<br>Need for spatial plans for large windfarms (>20 megawatts)<br>Support for renewable energy developments must be compatible with protecting and enhancing the natural and historic environment |
| SPP20 : Role of Architecture and Design Scotland (2005) | Importance of design in delivering sustainable and social communities and landscape quality |
| PAN 44 : Fitting New Housing Development (1994) | Maintaining the character and identify of landscape and securing the quality of Scotland's environment |
| PAN 45 Annex : Planning for Micro-Renewables (2006) | Micro-renewables which can be integrated into new developments in the design stage |
| PAN 67 : Housing Quality (2003) | Designing successful and sustainable places through layout, landscape, scale and mix and details |
| PAN 68 : Design Statements (2003) | Ensuring design principles and therefore environmental quality are at the centre of a proposed development |
| PAN 71 : Conservation Area Management (2004) | Good practice for managing change within Conservation Areas and minimising impact on the built environment |
| PAN 72 : Housing in the Countryside (2005) | Key message – ensuring that developments enhance local character and make a positive contribution to the environment |
| PAN 83 : Masterplanning (2008) | Key message – masterplanning ensures developments are designed successfully and in a sustainable manner, minimising impact on the environment |
| PAN 84 : Reducing Carbon Emissions in New Development (2008) | Good practice guidance and technical calculations to deliver low and zero carbon developments |
| Designing Places : A Policy Statement for Scotland (2001) | Ensure sensitive siting and design of all development making the most of its setting in the landscape |
| NPPG 5 - Archaeology and Planning – Scottish Executive 1998 | Government planning policy is set out on the protection, conservation and management of archaeological resources |
| NPPG 18: Planning and the Historic Environment (1999) | To conserve Scotland's culture and historic environment |
| SPP1 The Planning System (2002) | To ensure that future planning contributes towards sustainable development |
| **Local and Regional** | |
| Living Shetland Project: Local Biodiversity Action Plan (199) | Aims to engage with local communities to promote the conservation and restoration of local habitats and species |
| 'Seas the Opportunity' A Strategy for the Long Term Sustainability of | Strategy sets out aims to enhance and conserve the overall quality of Scotland's coasts and seas, their |

| Policy, Plan or Programme | Summary of Relevant Environmental Objectives and corresponding implications for the Wind Energy Development IPP |
|---|---|
| Scotland's Coasts and Seas (2005) | natural processes and their biodiversity |
| Shetland Transport Strategy 2007 (draft) | Sets out strategy for development of an efficient and reliable transport system for Shetland |
| Orkney and Shetland Area Waste Plan (2003) | Sets out a waste management strategy for Orkney and Shetland. The Wind Energy Development IPP should develop measures aimed at controlling and reducing waste generation and associated environmental impacts |
| Shetland Island Council Structure Plan (2000) | The Wind Energy Development IPP is not itself part of the statutory plan (Shetland Structure Plan 2000 and Shetland Local Plan 2004).However it responds to Scottish Government objectives contained within the statutory plan<br><br>The Shetland Structure Plan 2000 sets out the general development strategy for the Shetland Islands and gives detailed guidance on all development including commercial and housing development. The Wind Energy Development IPP will be used to update the policies within the structure plan and so will be closely related to this document |
| Shetland Local Plan (2004) | Presents policies and recommendations for the development and use of land throughout Shetland.<br><br>Sets out policies in relation to all potential developments<br><br>As above, the WED IPP will be used to update the policies within the local plan and so will be closely related to this document |
| Shetland Island Council Corporate Plan (2008) | Sets out measures aimed at achieving a range of 'Targets and Priorities' developed by the Community Planning Board |
| Shetland Islands Council Priorities & Targets (2007) | Conserve and where possible improve the quality of life and the environment |
| Shetland Island Council Sustainable Development Implementation Plan (2008) | Sets out priorities and actions which contribute to the achievement of sustainable development in Shetland |
| Shetland Cultural Strategy (2004) | Sets out objectives for developing cultural facilities, services and activities for the benefit of the Shetland community |
| Shetland Islands Council Draft Interim Planning Policy: Towards Sustainable Construction and Better Design (2009) | Provides location, design and amenity guidance and policy for Housing and Other Development within Shetland |
| Shetland Islands Council Draft Interim Planning Policy: Minerals | Provides sound and comprehensive policies for minerals development leading into the next decade, based on up-to-date information and legislation. |
| Shetland Islands Council Draft Interim Planning Policy: Energy | Provides policies for the provision of energy and energy infrastructure leading into the next decade, based on up-to-date information and legislation. |

## 2.2 ENVIRONMENTAL BASELINE AND KEY ENVIRONMENTAL ISSUES

### 2.2.1 Baseline

This section describes the proposed structure and level of detail, which will be used to form the environmental baseline in the SEA Environmental Report on the WED IPP. The key environmental issues and problems are summarised in Section 2.3. These have been identified from the review of plans and programmes, consultations within SIC and a review of baseline information held by SIC. To establish an environmental baseline of current conditions that relate to the SEA and SIC objectives existing environmental and sustainability data were reviewed from a range of sources that included the following:

- Scottish Environment Statistics On-line;
- Scottish Social Statistics (SE National Statistics Publication, 2001);
- Shetland Islands Council (internal documents and reports);
- Shetland in Statistics 2008 and
- SEPA.

The baseline information provided below describes the current state of the environment and provides a basis for predicting the likely evolution of the environment without implementation of the plan (as required in the Scottish Act Schedule 3, Para 2). The indicators and their baseline (set out in Table 3.6) are specific to the activities of SIC and will be used to monitor the environmental effects of the WED IPP and reference will be made to the broader picture described below.

### 2.2.2 Biodiversity, Flora and Fauna

Shetland is home to many habitats that are designated under international or national legislation or by SIC. This section sets out these areas and highlights their respective level of protection. This section also provides details regarding species that are protected under European or national legislation, together with further information on priority species and habitats.

#### Designated Areas

*Special Protection Areas (SPAs)*
SPAs are strictly protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC), also known as the Birds Directive, which came into force in April 1979. They are classified for rare and vulnerable birds, listed in Annex I to the Birds Directive, and for regularly occurring migratory species. The 12 SPAs in Shetland include Foula, one of only seven known EU breeding sites for Leach's Petrel. The full list and a description of SPAs in Shetland are given in Table 2.2:

**Table 2.2: Special Protection Areas in Shetland**

| Site | Description |
|---|---|
| **Noss** | High cliffs supporting internationally important breeding populations of migratory seabirds including fulmar, gannet, great skua, kittiwake and guillemot |
| **Fetlar** | Heathlands, marshes, cliffs and rocky shores important for breeding birds and waders including internationally important populations of red-necked phalarope, Arctic tern, fulmar, whimbrel, Arctic skua and black guillemot; nationally important populations of dunlin and notable populations of red-throated diver |
| **Hermaness and Saxa Vord** | Sea cliffs and moorland supporting internationally important breeding populations of fulmar, gannet, great skua, guillemot and puffin |
| **Fair Isle** | Large colonies of breeding seabirds (including fulmars, shags, Arctic skuas, kittiwakes, guillemots and puffins); internationally important bird migration landfall and study site; endemic Fair Isle sub-species of wren |
| **Foula** | Rocky coastline and large areas of moor, supporting internationally important breeding populations of seabirds (including breeding great skua, guillemot and puffin) and nationally important numbers of breeding fulmar, shag, Arctic skua and razorbill |
| **Mousa** | Low grassy island with internationally important breeding colonies of storm petrel and Arctic tern |
| **Ramna Stacks and Gruney** | Group of small rocky islets with internationally important colony of Leach's petrel |
| **Sumburgh Head** | Cliffs and boulder beaches supporting a nationally important breeding population of Arctic tern, plus other breeding seabirds |
| **Ronas Hill, North Roe and Tingon** | Areas of blanket bog supporting nationally important numbers of breeding red-throated diver, merlin, whimbrel, Arctic skua and great skuas. |
| **Lochs of Spiggie and Brow** | Eutrophic 'machair type' loch regularly supporting nationally important wintering population of Icelandic whooper swans. |
| **Papa Stour** | Heathland and cliffs supporting nationally important numbers of ringed plover and Arctic skua, and large seabird colonies. |
| **Otterwick and Graveland** | Comprises two areas of open moorland with numerous pools and lochans on Yell. Inland areas are dominated by blanket bog, with some stretches of dry heather moorland. A band of maritime grassland extends along the coastal stretch to the Graveland peninsula. Breeding population of European importance species red-throated diver |

*Source: www.snh.gov.uk*

*Special Areas of Conservation (SACs)*

SACs are designated under the EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, known as the Habitats Directive. In the UK, sites are protected under The Conservation (Natural Habitats, &c.) Regulations 1994, due to the presence of one or more habitats or species listed in the Directive and management plans are written to ensure 'favourable conservation status.' The 12 SACs in Shetland are listed and described in Table 2.3 below:

**Table 2.3: Special Areas of Conservation in Shetland**

| Site | Description |
|---|---|
| **Hascosay** | Active blanket bog with an intact pool system displaying a range of shallow mud-bottom hollows with typical Shetland blanket bog vegetation and a diverse range of Sphagnum species |
| **Keen of Hamar** | Vegetated calaminarian grassland area on serpentine bedrock and (base-rich) scree areas that support a unique community of plants including a number of rare northern species and one sub-species (Edmondston's chickweed) found only in Unst |
| **Tingon** | An extensive area of active blanket bog dominated by Sphagnum bog moss in the hollows, undisturbed heather and hare's tail cotton grass. The area includes a large number of pools and lochans; it is also notable for peat mounds supporting vegetation more usually found on dry heaths |
| **Ronas Hill, North Roe** | Areas of active blanket bog on lower lying ground and alpine and sub-alpine heaths are present. Also peat mounds capped with a vegetation community more usually associated with dry heaths. Heathlands are generally dominated by heather and carpets of woolly hair moss (with several areas of juniper vegetation). Bog vegetation dominated by heather, hare's tail cotton grass and deer grass, with a well-developed understorey of mosses and liveworts. Pools and lochans provide breeding sites for redthroated divers |
| **Mousa** | The largest single colony of breeding common seals within Shetland (about 600 breeding females) which represents about 2% of the total UK common seal population |
| **Papa Stour** | Exposed rocky coastline fringed by submerged bedrock and boulder reefs. Habitats include extensive kelp forests and deeper reefs dominated by invertebrates such as soft coral. Papa Stour has excellent examples of caves, tunnels and arches, with rich communities of algae and sponges |
| **The Vadills** | A complex lagoon system comprised of 8 shallow basins of varying salinity, separated by the sea by shallow rock, boulder or shingle narrows. The area supports a graduation of habitats and a high diversity of communities and species, including several species rare or unknown elsewhere in Shetland |
| **East Mires and Lumbister** | Active blanket bog |
| **Yell Sound Coast** | Nationally and internationally important population of breeding otters. It is estimated that the site supports at least 192 otters, representing about a quarter of the Shetland population |
| **Fair Isle** | European dry heaths; vegetated sea cliffs of the Atlantic and Baltic coasts |
| **North Fetlar** | Alkaline fens; European dry heaths |
| **Sullom Voe** | Coastal lagoons; large shallow inlets and bays; reefs |

*Source: www.snh.gov.uk*

*Sites of Special Scientific Interest (SSSI)*

These areas are protected under the Wildlife and Countryside Act (1981) as amended by the Nature Conservation (Scotland) Act 2004. Sites are designated due to the presence of important flora, fauna or geographical features. Shetland has 81 sites designated for the interests listed below in Table 2.4. Some sites are designated for several reasons.

**Table 2.4: Sites of Special Scientific Interest in Shetland**

| List of SSSIs in Shetland | |
|---|---|
| Geology (31 sites) | Intertidal Habitats (6 sites) |
| Geomorphology (7 sites) | Aquatic Flora (6 sites) |
| Montane habitats (1 site) | Rare Plants (5 sites) |
| Serpentine Vegetation (4 sites) | Seabirds (9 sites) |
| Other Heatherland (4 sites) | Wildfowl (3 sites) |
| Marsh and Meadow (4 sites) | Aquatic Fauna (3 sites) |
| Limestone and Grassland (1 site) | Mammals (3 sites) |
| Sand Dune Flora (2 sites) | Trees and Woodland (4 sites) |

*Source: Shetland Island Council*

*Ramsar Sites*

Wetland areas of high ecological value can be designated as Ramsar sites under the convention on wetlands of international importance.

One site in Shetland - Ronas Hill, North Roe and Tingon -was designated as a Ramsar site in August 1997. It is important primarily for its red-throated divers and the nationally rare Arctic water flea, Eurycerus Glacialis.

*National Nature Reserves (NNR)*

NNRs are sites of special natural interest, and provide opportunities for environmental education and the informal enjoyment of nature by the public. Shetland has three NNRs and these are listed below:

- Hermaness
- Keen of Hamar
- Noss

Two of Britain's largest seabird colonies can be found at Noss and Hermaness. Rare plants can be found at the Keen of Hamar, one of which, Edmonton's chickweed, is only found at one other site in the world.

*Marine Consultation Areas (MCA)*

MCAs are designated due to the quality and sensitivity of the marine environment. There are four MCAs in Shetland and these are listed in Table 2.5.

**Table 2.5: Marine Consultation Areas in Shetland**

| Site | Description |
|---|---|
| **Brindister Voe and the Vadills** | Brindister Voe includes communities representative of Shetland voes in general. The Vadills comprises the most complex and least disturbed lagoon system in Shetland, unique in the British Isles |
| **Swinister Voe and the Houb of Fora Ness** | Swinister Voe is included because of its rich lower shore fauna and flora. The Houb contains communities characteristic of shallow, submerged, extremely sheltered conditions. The gravel rapids community is probably the best such example in Shetland |
| **The Houb, Fugla Ness** | The site contains extensive areas of sediment shores, (unusual in Shetland), as well as more widespread boulder/shingle shores. The rapids at this site are of boulders |
| **Whiteness Voe** | The bay at the head of the Voe is of very high scientific interest because it contains the best-developed bed of eel grass in Shetland and because the rich sediments include both widely occurring and rare communities and species |

*Source: www.snh.gov.uk*

*Local Protection Areas (LPA)*
These are Council designated sites which are regarded by the Council as worthy of protection. Reasons can include scenic or historic value or presence of flora or fauna. It is the Council's policy to keep these areas free from development unless the development provides facilities that benefit the community as a whole.

*RSPB Reserves*
There are 4 RSPB reserves in Shetland, which are located at:

1) Sumburgh Head;
2) Mousa;
3) Fetlar: and
4) Loch of Spiggie.

Table 2.6 below summarises the designated sites on Shetland.

**Table 2.6: Designated Areas**

| Designation | Total Number | Area within Shetland (ha) | % of Total Area of Shetland |
|---|---|---|---|
| Site of Special Scientific Interest (SSSI) | 81 | 20,138 | 12.2% |
| Special Areas of Conservation (SAC) | 12 | 15,348 | 9.3% |
| Special Protection Areas (SPA) | 12 | 15,157 | 9.2% |
| Ramsar | 1 | 5,470 | 3.3% |
| Marine Consultation Areas | 4 | Information not available | Information not available |
| National Nature Reserve (NNR) | 3 | 1,307 | 0.8% |

*Source: www.snh.gov.uk*

## Designated Species

It will be important to consider the effects of any proposals on European and nationally protected species in the area. European species are given a high level of protection under Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora which is transposed into UK law by The Conservation (Natural Habitats &c) Regulations 1994. These species include otter, wildcat, great crested newt, some cetaceans and all bat species. Disturbance to any of these species requires a license from the Scottish Government and demonstration that no reasonable alternative exists and that proposals would not affect the conservation status of the species.

A number of animal and plant species are protected under the Wildlife and Countryside Act 1981 and the Nature Conservation (Scotland) Act 2004 including golden eagle, osprey, hen harrier, pine marten, red squirrel and water vole. Statutory protection is also given to badger under the Protection of Badgers Act 1992.

Although not all of these species occur on the Shetland Islands, some, such as otter have been recorded on a regular basis within boundary of the WED IPP.

### Priority Habitats and Species

As part of the Living Shetland *draft* Local Biodiversity Action Plan, priority habitats and species have been identified. Priority habitats include roadside verges, machair, herb-rich meadows, wet meadows and arable crops. In some cases, habitat action plans have been developed. Table 2.7 lists the priority species for which specific action plans have been developed.

**Table 2.7: Species Action Plans in Shetland**

| List of Species Action Plans in Shetland | |
|---|---|
| Arable Weeds | Bumble bees |
| Harbour porpoise | Oyster plant |
| Skylark | Arctic Char |
| Breeding Waders | Red necked Phalarope |
| Merlin | Farmlands birds |
| Hawkweeds | Red-throated diver |
| Eider | |

*Source: Shetland Islands Council*

The presence of some species in Shetland is highly significant in a national context, for example 90% of the UK population of the red-necked phalarope is present in Shetland. Similarly, Shetland is home to approximately 90% of the UK's Whimbrel population. Coastal cliffs provide important nesting sites for breeding seabirds. Shetland is home to one tenth of the total seabird population of Britain; in excess of one million birds from 22 species. The varied coastline of Shetland supports diverse habitats and species. Voes (inlets/sea lochs) provide shelter and muddy conditions exist at the heads of some of the longer voes, which are inhabited by species such as cockles and lugworms. In deep water, reefs are formed from large horse mussels. Sandeels, which are an important food source for Shetland's many seabirds, mammals, and commercial fish stocks are supported by finite offshore supplies of sand.

## 2.2.3 Population and Human Health

### Background

Shetland's population has fallen by four percent over the last 25 years, an average of 35 people a year. The trend towards centralisation of the population towards Lerwick and within a 15 to 20 minute commute of Lerwick continues.

Around 41 percent of the population now lives in Lerwick. Since 1991, Shetland's population aged over 65 has risen by 31 percent and the progression of an ageing population looks set to continue, with the population of over 50s increasing by 1.9 percent in the last year.

### Accessibility and Social Exclusion

A recent report[6] by SIC found that a section of the Shetland community, namely those without easy access to private car use, have difficulty in accessing certain services and opportunities. This affects peoples' opportunity to access employment, education, social events and to purchase healthy food at a reasonable cost. This is a particular problem for those in outlying communities or those with mobility problems.

### Access to the Natural and Built Environment

No relevant baseline information was obtained relating to access to the built or natural environment.

[6] Deprivation and Social Exclusion in Shetland, Shetland Islands Council, 2006

## Health and Healthy Lifestyles

The following data (Table 2.8, 2.9, & 2.10) provides an overview of the proportions of people who are in good and poor health. When viewing these figures, it is important to take into account that the population is declining and aging.

**Table 2.8: Health Statistics for Shetland**

| Health Issues | Statistics for Shetland |
|---|---|
| Average age of a person with good health | 59.58 |
| Average age of a person with a limiting long term illness | 32.29 |
| Percentage of economically inactive people who are permanently sick/disabled | 15.45 |
| Percentage of households with one or more carers resident | 15.45 |
| General health - % Good<br>% Fairly good<br>% Not good | 71.72<br>21.55<br>6.73 |
| Percentage of population with a limiting long term illness | 15.74 |
| Percentage of population that does not have a limiting long term illness | 84.26 |
| Life Expectancy at birth (2002-4) | 74.2 |

*Source: Scottish Executive Statistics*

**Table 2.9: All heart Diseases standardised Mortality Rate per 100,000 Population <75**

| Year | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|
| Shetland | 123.6 | 147.8 | 152.8 | 133.1 | 86.1 | 88.0 | 53.8 | 85.2 | 86.0 |

*Source: NHS*

**Table 2.10: Stroke/Cerebrovascular standardised Mortality Rate per 100,000 Population <75**

| Year | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|---|---|---|
| Shetland | 42.8 | 45.0 | 18.8 | 28.9 | 19.2 | 31.1 | 35.8 | 13.2 | 17.0 |

*Due to the small numbers the figures should be interpreted with caution.
*Source: NHS*

## Employment

Table 2.11 shows the breakdown of employment in Shetland by Industrial Group. It should be noted that statistics for Self-Employed are included in the figures for Primary, Manufacturing, Construction and Services. These figures do not include agricultural employment.

**Table 2.11: Employment in Shetland by Industrial Group (2003 and 2007)**

| Standard Industrial Classification Grouping | Total numbers employed (2003) | Total numbers employed (2007) |
|---|---|---|
| Primary | 1,620 | 1,136 |
| Manufacturing | 928 | 906 |
| Construction | 717 | 893 |
| Services | 8,882 | 9,309 |

*Source:Shetland in Statistics 2008*

### 2.2.4 Soils and Geology

**Geology**

The majority of the rocks of Shetland are part of an old, deeply eroded mountain chain called the Caledonian Orogenic Belt which was raised up as a mountain block between 400 to 600 million years ago. This same mountain chain forms most of Norway, Scotland and Northern Ireland. In the south-eastern and western parts of Shetland, these rocks have been overlain by sedimentary rocks of old sandstone age. These rocks were laid down and folded during the Devonian era around 400 million years ago. Running north-south through Shetland are several tear faults where blocks of rock have been displaced by movements of the earth's crust. The principal fault of this type is the walls Boundary fault. This fault is thought to be the northern extension of the Great Glen fault found on mainland Scotland.

Metamorphic schist and gneiss extends from Fitful Head and the Clift Hills of south Mainland, through central Mainland and the coastal portion of north Mainland, east to the islands of Whalsay and Out Skerries and north to the island of Yell and the western parts of Fetlar and Unst. In central Mainland, the metamorphosed-siliceous sedimentary rocks are interspersed with bands of crystalline metamorphosed limestone which have been eroded to form a series of valleys. Superficial deposits of glacial drift, boulder clay and alluvium overlie bedrock in places, particularly on low lying areas, and the higher ground is commonly blanketed with peat. The eastern parts of Unst and Fetlar are characterised by serpentine and gabbro bedrock with a surface layer of shattered rock and glacial drift.

Much of the north Mainland, west of the walls Boundary fault (from Ronas Hill and the North Roe plateau to the island of Muckle Roe), consists of red granite and other igneous rocks. These rocks are overlain with superficial deposits of peat, boulder clay and glacial drifts. The cliffs of Eshaness and the island of Papa Stour are formed by lavas and tuffs (volcanic ash) of old red sandstone age. The West Mainland is characterised by folded sandstone of old red sandstone age, with granite in the extreme south. The area is overlain by peat and areas of boulder clay. The south eastern coastal strip of mainland (from Sumburgh Head northwards to Lerwick), and the adjacent islands of Bressay, Mousa and Noss are formed of gently inclined sandstones, flagstones and conglomerates of old red sandstone age. In places the sandstone is interbedded with limestone and mudstone. These rocks are overlain by significant areas of boulder clay and other glacial drifts. the outlying islands of Fair Isle and Foula are formed predominantly of sandstone.

**Vegetation**

Shetland's vegetation is dominated by peatland, heather moorland and montane. Improved rough grassland is concentrated along the coast, around the voes and in the valleys. The best agricultural land available in Shetland, improved grassland and good rough grassland, can be found in the valleys of the central mainland; along the south and east coasts of the southern mainland; in eastern regions of Unst and Fetlar; and along the Walls boundary fault. These are the areas of greatest agricultural production.

Shetland's flora is impoverished in comparison to that of mainland Britain. This is largely due to the climate and the islands' isolation. Shetland has the highest average humidity in Britain. This, combined with its salt-laden atmosphere, limits the botanical diversity and the scope for crop growing in the Islands.

Shetland is predominantly treeless. The only significant tree growth is situated at

Kergord in the Weisdale valley, although small patches of trees are scattered throughout Shetland at various sheltered locations.

**Agricultural Land**

In recent years there has been a decline in agricultural activity. As detailed in Table 2.12, the total land used for tillage in Shetland was almost 437 hectares in 2001. This figure fell to 400 by 2003. Intensive sheep farming has increased its dominance of the agricultural economy, particularly over the past 30 years.

The amount of land suitable for agriculture in Shetland is limited and as such, fertilisation and reseeding of moorland has been used to increase agricultural productivity. The amount classed as improved or good grassland is also somewhat limited. Farmers have been encouraged to manage land in a more environmentally sensitive manner since Shetland was designated an environmentally Sensitive Area in 1993.

**Table 2.12: Agricultural Land Use in Shetland**

| Agricultural Land Use Practice | Hectares |
|---|---|
| Vegetables for human consumption | 17.35 |
| Other crops | 2.31 |
| Bare fallow | 131.59 |
| Total tillage | 436.51 |
| Grass under 5 years old | 2,580.61 |
| Arable | 3,017.12 |
| Total crops and grass | 22,016.11 |
| Sole right rough grazing | 56,179.8 |

*Source: Scottish Agricultural Census 2001*

### 2.2.5 Water

**Surface Water Quality**

The Scottish Environment Protection Agency (SEPA) monitors surface water quality in watercourses, estuaries and other water bodies. In addition, under the Water Framework Directive, enacted in Scotland in the Water Environment and Water Services (Scotland) Act 2003, SEPA has new responsibilities relating the management and protection of river catchments (river basin districts), which includes the groundwater resource within those catchments.

SEPA classifies rivers in terms of water quality from A1 (excellent), A2 (good) to D (seriously polluted) this classification is based on a combination of chemical, biological and aesthetic criteria. Similarly estuarine waters are also classified from A to D.

Within Shetland SEPA carry out a range of monitoring of surface and coastal waters. A selection of the most up to date available data is contained within Table 2.13 below.

**Table 2.13: Water Quality Monitoring in Shetland**

| Surface Water Body / Coastal Length Monitored | Classification |
|---|---|
| Burn of Voxter/Burn of Laxdale | A2 |
| Burn of Dale | A2 |
| Stromfirth Burn | A2 |
| Burn of Weisdale | A2 |
| South Burn of Burrafirth | A2 |
| Burn of Laxo Bigging | A2 |
| Laxo Burn | A2 |
| Burn of Bouster | A2 |
| Burn of Arisdale | B |
| Bressay Sound | B |
| Breesay Sound (at Lerwick) | C |
| Yell Sound (Colla Firth) | B |
| Sullom Voe | B |
| Mid Yell Voe | C |
| Balta Sound (Unst) | B |
| Vidlin Voe | B |
| Vassa Voe (Cat Firth) | A |
| West Burra (Hamnavoe) | A |
| East Voe of Scalloway | C |

*Source: www.sepa.gov.uk*

## The Public Water Supply

The public water supply is extracted from 24 lochs and burns (See Table 2.14) and piped to one of 21 treatment works. In addition, seven water supply zones have a total of 17 service reservoirs. 2.15 gives details of the treatment works and their use.

**Table 2.14: Water Sources in Shetland**

| Water Bodies used as Sources | Water available per Day (M lpd)* | Associated Water Treatment Works |
|---|---|---|
| Arthur's Loch | 0.10 | West Burrafirth |
| Bu Water | 0.20 | Whalsay |
| Burn of Channerwick | 0.30 | Sandwick |
| Burn of Geosetter | 0.10 | Bigton |
| Burn of Greystanes | 0.20 | Sandwick |
| Burn of Laxdale | 0.20 | Cunningsburgh |
| Eela Water | 2.50 | Sullom Voe II |
| Gorda Water | 0.20 | Papa Stour |
| Helliers Water | 0.50 | Unst |
| Laxo Burn | 0.60 | Mid Yell |
| Loch of Brindister | 1.20 | Lerwick |
| Loch of Brough | 0.70 | Bressay |
| Loch of Brough | 0.50 | Cullivoe |
| Loch of Brow | 0.40 | Sumburgh |
| Loch of Huesbreck | 0.50 | Sumburgh |
| Loch of Huxter | 1.50 | Whalsay |
| Loch of Kettlester | 1.22 | South Yell |
| Loch of Watlee | 1.00 | Unst |
| Roer Water | 4.55 | Sullom Voe II |
| Sandy Loch | 6.20 | Lerwick |
| Skerries Reservoir | 0.03 | Skerries |
| Skutes Water | 0.70 | Fetlar |
| Springs Burn | 0.06 | Foula |
| Vaadal Burn | 0.06 | Fair Isle |

**Table 2.15: Water Treatment and Usage in Shetland**

| Water treatment works | Population served | Average water consumption (M lpd) | Average daily demand as % of capacity |
|---|---|---|---|
| Bigton | 170 | 0.06 | 60 |
| Bressay | 330 | 0.10 | 67 |
| Cullivoe | 260 | 0.06 | 60 |
| Cunningsburgh | 450 | 0.13 | 87 |
| Fair Isle | 70 | 0.02 | 33 |
| Fetlar | 100 | 0.04 | 40 |
| Foula | 50 | 0.01 | 20 |
| Lerwick | 9,000 | 5.32 | 78 |
| Mid Yell | 550 | 0.25 | 50 |
| Papa Stour | 40 | 0.05 | 100 |
| Sandness* | 150 | 0.04 | 80 |
| Sandwick | 840 | 0.24 | 48 |
| Skeld and Reawick | 400 | 0.10 | 50 |
| Skerries | 90 | 0.02 | 67 |
| South Yell | 300 | 0.10 | 83 |
| Sullom Voe II | 3,600 | 3.30 | 55 |
| Sumburgh | 1,500 | 0.47 | 78 |
| Unst | 1,000 | 0.46 | 92 |
| Walls | 400 | 0.12 | 80 |
| West Burrafirth | 30 | 0.02 | 67 |
| Whalsay | 1,020 | 0.27 | 54 |

M lpd - million litres per day
*Source: North of Scotland Water Authority*

### Flooding and Surface Run-Off

The most common cause of historical flooding events in Shetland has been inundation by the sea. However, the trend has shifted in recent times and heavy rainfall is now the cause of the majority of incidents. Burns in Shetland tend to be short and steep, which can increase flood risk during heavy rainfalls. This is likely to be exacerbated by climate change in the future, as predictions for Shetland are for extended periods of drought followed with more severe bursts of rain.

The Development Plans Service at SIC is carrying out a survey of watercourses that are likely to be affected by future development. From this, the capacity of watercourses to carry surface water discharge from developments will be determined.

### Vulnerability to the Effects of Climate Change

Although the relative significance of rainfall-related flooding events has increased, coastal-related flooding is still a highly significant issue and again, climate change is predicted to cause further problems. Shetland is thought to be sinking at a rate of approximately 2 to 3 millimeters (mm) per year and sea level rise over the next century has been predicted to be between 0.5 and 1 metre. Even at present, storm hazard on Shetland is potentially greater than anywhere else in the UK and maximum wave heights around Shetland have been rising in recent decades. In addition, increases in the frequency and severity of storms are predicted, with coastal water extreme levels forecasted to become 5 to 10 times more likely by the 2050. The combination of the above factors will extend the inward limit of storm driven

water and whilst this is not a problem for many areas of Shetland's rocky coastlines, voe heads could be significantly affected due to the funnelling of storm surges.

Existing coastal defences will need to be replaced or modified to adapt to the effects of climate change. Modest predictions suggest that in order to bring the level of protection back to that of the 1990s defences will need to be increased in height by 10 to 30 centimeters (cm). Less conservative estimates suggest required increases of almost 80 cm.

Erosion of beaches from rising sea levels and increased wave action is a current problem which is predicted to become more significant in coming years. Offshore sediment supplies are finite and the potential for natural recharging of these beaches is therefore limited. Human activity such as provision of coastal defences and other physical structures can cause additional erosion.

**Fishing and Aquaculture Industries**

In 2003, a total of 31,659,776 tonnes of wet fish was landed in Shetland. The seas around Shetland are known spawning and nursery areas for Norway pout, lemon sole, haddock, herring, sandeel and whiting. The fishing industry is supported by the following species:

- Pelagic fishery – mackerel, herring, blue whiting
- White fishery – haddock, cod, anglerfish, nephrops
- Inshore fishery – scallops, crabs, lobsters, nephrops

Fish farms occupy the many of the suitable voes and produce salmon, sea-trout, char, halibut, cod and shellfish, mussels being the most common. In 2003 there were 46 salmon farms, which produced a total of 63,948 tonnes.

**Marine Pollution**

Marine pollution arises from various different sources including domestic sewage, industrial waste, naturally occurring nutrients and ballast discharged offshore by oil tankers. Other forms of pollution are those caused by noise and light; these are especially relevant in terms of aquaculture. Eutrophication, the enrichment of water, is the consequence of high levels of pollution from too many sewage outfalls and badly positioned septic tanks. This can cause damage to marine habitats and an example of this is in upper Whiteness Voe where the source of the majority of the pollution is Wormadale.

### 2.2.6 Air Quality

**Background**

The Air Quality Strategy provides a framework for air quality control through air quality management and air quality standards. These and other air quality standards and their objectives have been enacted in Scotland through the Air Quality (Scotland) Regulations 1997, as amended, most recently in 2002. The Environment Act 1995 requires Local Authorities to undertake air quality reviews.

In areas where an air quality objective is not anticipated to be met, Local Authorities are required to establish Air Quality Management Areas (AQMA) and to develop and implement Air Quality Action Plans that detail the measures to be taken to work towards reducing pollution levels to below the objective targets.

The main industrial area on the islands is the Gremista Industrial Estate to the north of Lerwick. There is a high concentration of regulated activity in this area including a

landfill site, energy recovery plant and an oil-fired power station. The Sullom Voe oil terminal handles around 25 million tonnes of oil each year and also contains a power station which supplies some of the islands electricity. Other industrial processes include quarrying, mineral processes and fish processing activities.

**Air Quality Management in Shetland**

The 1995 report, 'Review and Assessment of Air Quality in Shetland'[7], presents air quality monitoring results and information on possible pollutant sources for Shetland. The second round of the review and assessment process was completed in 2003. The report concluded that there was no risk of exceedance of any of the relevant objectives in the assessment years. Consequently, no Air Quality Management Areas (AQMAs) were declared and no Air Quality Management Plans (AQMPs) are in place. There are no existing air quality constraints or significant areas of pollution in Shetland.

The LAQM Progress Report (2007) provides an update on pollutant monitoring data and information on industrial, transport, commercial and domestic atmospheric emissions. The report notes that a recent assessment of atmospheric emissions from the Lerwick Power Station predicted exceedences of the $NO_2$ 1-hour mean objective in areas around the power station. The report concludes that there are no predicted exceedences of other NAQS objectives in the Shetland Islands.

### 2.2.7 Climatic Factors

Under the Kyoto Protocol the UK Government is committed to reducing greenhouse gas emissions by 12.5% below 1990 levels. The UK Government also set a more ambitious domestic target of reducing $CO_2$ emissions by 20% below 1990 levels by 2010. More recently, under the Climate Change Bill (2008) the UK has committed to an 80% reduction in $CO_2$ by 2050.

In 2006 the Scottish Executive (now Government) published Scotland's Climate Change Programme[8]. This document sets out how Scotland will make its contribution to UK targets. The Scottish Programme will contribute directly to the UK domestic goal of reducing emissions of carbon dioxide to 20% below 1990 levels by 2010. It has identified the "Scottish Share" towards this reduction as being 1.7 million tonnes of carbon (MtC) in annual savings and sets out a range of strategies for delivering this reduction.

The SIC Corporate Plan sets a target of reducing Shetland's $CO_2$ emissions by 30% by 2020. The SIC Sustainable Development Implementation Plan contains actions to ensure implementation on SIC's Climate Declaration.

### 2.2.8 Material Assets

**Background**

Scotland's Sustainable Development Strategy highlights that current lifestyle patterns are unsustainable, and discusses their global significance. It also sets out a number of priorities to help reduce the "global footprint". A major challenge is to move towards more sustainable consumption and production. This will include reducing inefficient use of resources; looking at the impact of products and materials across

[7] 'Air Quality in Shetland – Review and Assessment' Shetland Islands Council Environment and Transportation Department – Operations Division

[8] *Changing Our Ways*, Scotland's Climate Change Programme, Scottish Executive, 2005

their whole life-cycle and encouraging people to think about the social and environmental consequences of their purchasing choices.

**Minerals**

Table 2.16 shows that Shetland is a net exporter of aggregates, most of which are high quality roadstone chippings extracted from Brindister quarry. Imports are predominantly sand and are likely to continue. The Scottish Government have agreed to a ban on subtidal aggregate extraction (hydraulic dredging) around Shetland to protect shellfish beds and prevent damage to Shetland's marine environment. Near Quendale, some commercial sand extraction occurs but the possible exacerbation of coastal erosion limits the potential for further extraction.

**Table 2.16: Aggregate/Mineral Imports and Exports (tonnes)**

| Year | Imports | Exports |
|---|---|---|
| 1996 | 6,875 | 13,623 |
| 1997 | 9,789 | 29,814 |
| 1998 | 8,757 | 33,476 |
| 1999 | 3,924 | 22,467 |

*Source: Shetland Island Council*

The only commercial talc quarry currently operates at Cross Geo on Unst. Talc deposits, with potential for extraction, are located on Fetlar and Unst and near Cunningsburgh. Shetland produced 12,000 tonnes of talc in 1986, almost all of it from Unst; this represented over 99% of total UK production. Talc production increased until 1990 but has since fallen and is likely to remain at approximately 5,500 tonnes per annum over the coming years.

A survey carried out in 1996 into potential sources of flagstones in Shetland identified a number of locations that may have the potential to be quarried for local use.

There has been copper mining at Sandwick and Quendale in the past. Chromite was quarried around Baltasound during the 19th century. Iron ores are associated with copper ores at Sandwick and Levenwick. Magnetite was mined at Sullom during the 1950s. In the 1970s some interest was shown in exploiting copper in the Vidlin area, but no development followed. Non-commercial deposits of other minerals (e.g. baryte and kaolin) occur in Shetland. Surveys have suggested that gold could potentially be exploited in parts of the Mainland and Unst.

### 2.2.9 Cultural Heritage

**Background**

Shetland possesses a rich heritage and is home to many sites of historical value including Viking settlements, brochs, standing stones, ancient crofts and ruined chapels. These are all important contributors to Shetland's strong and unique cultural identity. A number of areas and features have been designated due to their historical importance.

**Designated Areas**

*Scheduled Monuments*

Scheduled monuments are given legal protection under the Ancient Monuments and Archaeological Areas Act 1979 as they are considered to be of national importance. Shetland currently has 365 scheduled ancient monuments which fall under the following categories (Table 2.17):

**Table 2.17: Scheduled Ancient Monuments in Shetland**

| Classification | Number of Sites in Shetland |
|---|---|
| Prehistoric: ritual and funerary | 111 |
| Prehistoric: domestic and defensive | 227 |
| Crosses and carved stones | 3 |
| Secular | 50 |
| Ecclesiastical | 21 |
| Industrial | 17 |

*Source: Shetland Islands Council*

*Conservation Areas*

A Conservation Area is 'an area of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance' (Planning (Listed Buildings and Conservation Areas) Act 1990). There are three Conservation Areas in Shetland, two in Lerwick and one in Scalloway.

*Listed Buildings*

Buildings are listed by Historic Scotland for their special architectural or historic interest. They are assigned to one of three categories depending on relative importance:

- **Category A** - Of national or international importance either historic or architectural, or fine little-altered examples of a particular period, style or building type;
- **Category B** - Of regional or more than local importance, or major examples of a particular period, style or building type which may have been altered; and
- **Category C** - Of local importance, lesser examples of any period, style or building type, as originally constructed or altered; and simple, traditional buildings grouped well with other in categories A and B or part of a planned group such as an estate or industrial complex.

There are currently 327 listed building in Shetland. Table 2.18 indicates the number and grading of listed buildings in each Shetland district.

**Table 2.18: Listed Buildings in Shetland**

| Location | Cat A | Cat B | Cat C | Total |
|---|---|---|---|---|
| Bressay | 1 | 10 | 3 | **14** |
| Delting | 0 | 10 | 4 | **14** |
| Dunrossness | 4 | 18 | 8 | **30** |
| Fetlar | 0 | 3 | 3 | **6** |
| Lerwick | 3 | 57 | 47 | **107** |
| Lerwick Landward | 0 | 1 | 1 | **2** |
| Nesting | 0 | 14 | 8 | **22** |
| Northmavine | 0 | 10 | 8 | **18** |
| Sandsting & Aithsting | 2 | 7 | 6 | **15** |
| Tingwall | 1 | 5 | 15 | **21** |
| Unst | 3 | 10 | 12 | **25** |
| Walls & Sandness | 0 | 13 | 10 | **23** |
| Yell | 2 | 10 | 18 | **30** |
| Totals | **16** | **168** | **143** | **327** |

*Source: Shetland Islands Council*

*Shetland Sites and Monuments Record*

In addition to designated areas and buildings, the Shetland Amenity Trust maintains the Sites and Monuments Record. This holds records of all known sites, ranging from pre-historic to the Cold War. There are currently 7,229 recorded sites, these are detailed in Table 2.19:

**Table 2.19: Shetland Sites and Monuments Record**

| Classification | Number of Sites in Shetland |
|---|---|
| Broch / possible broch | 141 |
| Chambered cairns | 118 |
| Souterrains | 26 |
| Fishing stations | 32 |
| Burnt mounds | 340 |
| Viking / Norse houses | 52 |
| Military remains | 436 |
| Wheelhouses | 7 |

*Source: Shetland Islands Council*

*Archaeological Sites*

In addition to the protected sites listed above, there is also the potential for development activities to affect Shetland's many archaeological sites. Shetland's rich archaeological heritage includes Viking sites, standing stones, ancient crofts and ruined chapels. Whilst many sites are identified within the Sites and Monuments Register, there is the potential for unknown archaeological sites to be affected.

*Designated Wrecks*

There are 2 protected wrecks in Shetland waters which have been designated due to their importance in terms historical and archaeological value. These have exclusion zones surrounding the wrecks, within which it is an offence, without a licence, to tamper with, damage or remove any objects or part of the vessel or to carry out any diving or salvage operation. The wrecks are the Wrangles Palais, which sank in 1687 (100m exclusion zone) and the Kennemerland, which sank in 1664 (250m exclusion zone).

### 2.2.10 Landscape

**Landscape Character**

SNH, in conjunction with partner Councils, has undertaken detailed review and classification of the various landscape areas and types in Scotland. The Shetland Islands landscape character assessment[9], identifies seven primary landscape types which are further subdivided into detailed landscape character areas. Inland landscapes are characterised by rolling hills, heather and rough grassland with historic buildings and features. Historic land use practices, particularly crofting and peat cutting, have helped to create the diverse landscapes. These landscape types are listed below:

- Coastal edge
- Farmed and settled lowlands and coast
- Farmed and settles voes and sounds
- Inland valleys
- Major uplands

[9] Gillespies 1998. A landscape assessment of The Shetland Isles. Scottish Natural Heritage, Review No 93

- Peatland and moorland
- Undulating moorland with lochs

**Designated Areas**

*National Scenic Areas (NSA)*
These are areas of exceptional scenic value and comprise some of the best examples of Scotland's landscapes. One NSA in Shetland covers seven of Shetland's finest sections of coastline. The locations of the seven zones are listed below:

- Hermaness (including Muckle Flugga and the western slopes of Saxa Vord)
- Fethaland (broad coastal strip from Uyea to Burravoe in Northmavine)
- Eshaness (including Hillswick Ness and the intervening coastline)
- Muckle Roe (western half of the island)
- Foula
- Fair Isle
- South West Mainland (from Fitful Head to Weisdale Voe and Skeld and including Burra, Trondra and the islands to the north)

*Source: www.snh.gov.uk*

*Tree Preservation Orders (TPO)*
Under the Town and Country Planning (Scotland) Act 1997, SIC must be given prior notification of intended works to protected trees. It is an offence to chop down, top, lop or wilfully destroy trees protected by a TPO without consent. There are 2 TPOs in Shetland; at Helendale House and the rear of Montfird Hospital, both in Lerwick. Possible future TPO sites include:

- Seafield at the Ness of Sound
- Scalloway
- Busta House
- Halligarth, Baltasound
- Tresta

*Source: Shetland Islands Council*

*Local Protection Areas*
These areas have been detailed in the Section 2.2.2 in relation to biodiversity. However it should be noted that they may also be designated by Shetland Islands Council due to landscape value.

### 2.3 LIKELY EFFECTS ON BASELINE CONDITIONS WITH OR WITHOUT WED IPP

Forecasting the evolution of the environment in the absence of the WED IPP should help to understand how the plan and its policies will contribute to changes in the environment in the future. This section in the Environmental Report will therefore evaluate the likely changes to the environment in Shetland assuming no WED IPP is implemented. The assumption is not, however, that previously adopted, draft and future relevant plans and programmes will not continue to be implemented. The SEA should therefore, assume that other adopted plans, programmes and policies will be delivered as planned.

## 2.4 CURRENT ENVIRONMENTAL ISSUES

Schedule 2 of the Scottish Act requires that the Environmental Report should include a description of existing environmental problems, especially those relating to any areas of particular environmental importance. The purpose of this section is to explore the key environmental issues that are relevant to SIC and whether the WED IPP is likely to have an effect either positively or negatively on these issues.

Current strategic environmental issues that have been identified are:

- **Biodiversity, flora and fauna:**
  - The abundance of nationally and internationally designated conservation sites in and around the Shetland Islands restricts the amount of available land and so places a strain on all kinds of development including those designed to harness wind energy. Because of this, greater planning pressure is exerted on the more 'urbanised' centres.
  - Due to the fact that many of the designated areas in the Shetland Islands are designated for their birds in particular seabird colonies, the protected species in question are particularly mobile and frequently rely on areas of land and water that lie out-side of the SPA or SAC boundary. Therefore, depending on location they can be particularly sensitive to wind energy developments.
  - Owing to changes in sea temperature and the predicted effects of climate change populations of some species, for example sand eels (*Ammodytes marinus*), may migrate away from the Shetland Islands. This would have many knock-on effects for protected species.
  - Population decline and loss of biodiversity is a global problem, and this extends to the Shetland Islands.

- **Population and Human Health:**
  - The way of life for many people in the Shetland Islands is changing and the move away from small-scale fishing and crofting and towards more commercial ventures has coincided with a shift in population from rural areas to urban areas. Because of this 'rural drift' over- centralisation around Lerwick is a possibility along with the migration of some of the population to mainland Scotland.
  - The large numbers of small, isolated communities that exist in the Shetland Islands mean that providing access to employment and essential services is challenging and costly.

- **Water:**
  - Because of the scarcity of areas available for water storage, Shetland has a finite water resource and so this must be carefully managed and protected. This is especially relevant to the Out Skerries, a small group of Shetland islands which have in the past experienced drought.
  - The ratio of coast to area of land in the Shetland Islands is very high and the marine and coastal environment this creates, is key to the prosperity of natural species and to economic activities such as fishing. Maintaining a high marine water quality is therefore of paramount importance.

- **Soils and Geology:**
  - The Shetland Islands hold a wealth of unique geology and as such, this must be protected.
  - Peat deposits on the Shetland Islands can pose a serious landslip hazard if there is a period of drought followed by heavy rain. This particular issue has implications for soil and geological resources, water quality, flooding and the safety of property.
  - Land available for agriculture on the Shetland Islands has traditionally been of poor quality. This, added to the fact that there is an economic demand for the islands' farming products (e.g. Shetland lamb) means that pressure to 'improve' land for agriculture needs to be balanced against conservation interests and other land uses such as housing.

- **Material Assets**:
  - Allowing for future development of oil and gas must be taken into account as these commodities already form a large proportion of the local economy.
  - The drive for sustainable energy sources on the Shetland Islands means that a number of renewable energy options are being taken forward. The environmental impact of such schemes may have the potential to cause significant environmental effects.
  - The Shetland Islands have few options available for waste disposal and currently the majority of waste is sent to landfill on a single landfill site to the north of Lerwick.
  - Due to the finite resources on the Shetland islands, a great deal of food, goods and materials are imported form outside the community. This means that transportation by sea is vital and the environmental effects of such activities are difficult to mitigate.
  - As a result of the heightened coastal flood risk on the Shetland Islands, a large amount of material resources are used to build coastal defences. Locally quarried rock armour is often used for this purpose.

- **Climatic Factors**:
  - A large proportion of the houses, roads and economic infrastructure on the on the Shetland Islands are located on the coast. The Islands are therefore more susceptible to coastal flooding than most other places in Scotland.
  - Strong westerly storms are a feature of the weather on the Shetland Islands and because of this storm management is needed to avoid coastal storm flooding.
  - Meeting targets for reducing greenhouse gases poses a challenge on the Shetland Islands as there is a lack of infrastructure that will be needed to deliver this. For example, most transportation in and around the islands is by either road or by boat, and the particularly isolated nature of many communities means that public transport is often not viable.

- **Air Quality**:
  - Shetland has an outstandingly high quality of air, due to their exposed position. Maintaining this high level of air quality must be a priority as any degradation would have effects on sensitive species and on the human population.
  - Although issues of air quality are diminished on the Shetland Islands (because of their isolated location and steady, windy, conditions) large

developments do have the potential to adversely affect air quality. Quarrying, energy production, transport and activities relating to the fishing industry all have the potential to adversely affect air quality and noise levels.

- **Cultural Heritage**
  - Due to its unique remoteness the Shetland Islands have a strong identity and maintaining this into the future should be recognised as an important challenge.
  - There is also a wealth of archaeological resources on the Islands that date back to prehistory encroachment of development could have the potential to threaten the setting or the integrity of such sites if unmitigated.

- **Landscape**
  - Scenic areas in the Shetland Islands are predominantly coastal and large parts of the Islands are designated as National Scenic Areas. This means that any developments on or near to the coast, which are conspicuous in nature, could potentially have an adverse effect on the landscape.
  - The Shetland Islands are quite flat in contour and there are very few trees on the island. This means that there is very little to screen any large developments and so they are more at risk of creating an adverse effect on the landscape.

### 2.5 SEA OBJECTIVES

The Environmental Assessment (Scotland) Act 2005 (the Scottish Act) does not require the generation of objectives or indicators by SIC to appraise the potential effects of its plan/programme. However, environmental protection objectives from other policies, plans and programmes should be taken into consideration where they are appropriate. The development of specific SEA objectives and indicators is a recognised way in which environmental effects can be described, analysed and compared. SEA objectives will describe the intent and desired direction of environmental change, whilst indicators will measure the performance of the WED IPP against these objectives.

To fulfil the requirements of the SEA Directive and the Scottish Act the SEA objectives should cover:

*'…. biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, landscape and the interrelationships between them.'*

(Schedule 3 of the Environmental Assessment (Scotland) Act, 2005)

Table 2.20 summarises draft SEA objectives for the WED IPP. The objectives have been developed as a result of integrating a number of strands of relevant information and are designed to consolidate:

- the environmental topics of Schedule 3 of the Scottish Act ;
- the objectives within the WED IPP;
- the Corporate Objectives of SIC;
- objectives from other relevant plans and programmes (most notably Scotland's Sustainable Development Strategy – see *Section 2.1* above)

- environmental issues and problems identified as part of the baseline analysis (see *Section 2.4* above).

**Table 2.20: Draft SEA Objectives for the WED IPP**

| SEA Topic | SEA Objectives |
|---|---|
| **Biodiversity (Flora and Fauna)** | 1. To further the conservation of biodiversity |
| **Population** | 2. To improve the quality of life for people and communities across Shetland |
| **Human Health** | 3. To improve the quality of health in Shetland |
| **Soil** | 4. To protect Shetland's soil resources and use them in a sustainable manner |
| **Water** | 5. To protect and enhance freshwater and marine water quality<br><br>6. To ensure that Shetland's water resources are used effectively and sustainably |
| **Air** | 7. To protect Shetland's air quality |
| **Climatic Factors** | 8. To reduce greenhouse gas emissions and to contribute to Scotland's 80% $CO_2$ reduction target<br><br>9. To adapt to the predicted effects of climate change |
| **Material Assets** | 10. To promote the sustainable use of Shetland's natural resources |
| **Cultural Heritage** | 11. To conserve and protect the historic environment<br><br>12. To conserve and promote the distinctive cultural heritage |
| **Landscape** | 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes<br><br>14. To improve those landscapes and seascapes that are degraded |

# 3 ENVIRONMENTAL ASSESSMENT

## 3.1 INTRODUCTION

This section sets out the scope, approach and level of detail proposed for the detailed environmental assessment of the WED IPP. An initial consideration of alternative objectives within the WED IPP is described together with, and analysis of, the key environmental issues. The proposed framework to be used for the appraisal of the WED IPP during the environmental assessment is also outlined.

The results of the assessment will be presented in the Environmental Report.

## 3.2 PLAN ALTERNATIVES AND SCOPING OF SIGNIFICANT ENVIRONMENTAL EFFECTS

### 3.2.1 Plan Alternatives

There are no alternative plans to the WED IPP framework but alternative objectives and policies within the framework have been considered during its evolution. The initial screening process (see Section 1.2) and evolution of the WED IPP have led to modifications being made to certain objectives and policies as the WED IPP has evolved.

Shetland Islands Council Structure Plan and Local Plan policies relating to windfarm location and design require updating in order to ensure that they are in accordance with the current legislation. Policies require to be more specific and detailed in order to provide clear and consistent policy guidelines to developers, local communities and the general public and provide the decision making framework for processing applications in terms of sustainable development. Without the review the existing policies would not:

- promote sustainable development
- promote sustainable use of renewable technologies.

Consequently Shetland Islands Council considers that there is only one alternative:

*'to undertake a policy review to ensure compliance with Scottish Government current objectives.'*

### 3.2.2 Scoping of Significant Environmental Effects

In accordance with the Environmental Assessment (Scotland) Act 2005, the study team has considered whether the environmental effects (positive and negative) of the WED IPP are likely to be significant. This initial scoping assessment was based on preliminary information about the scope of objectives and measures in the WED IPP; information made available by SIC; the known environmental baseline likely to be affected by the IPP and the likely environmental issues.

A summary of the initial scoping appraisal is presented in Table 3.1.

**Table 3.1: Scoping of Significant Effects**

| SEA Issues | Scoped In | Scoped Out | Reasons |
|---|---|---|---|
| Biodiversity, flora and fauna | Yes | No | On the basis of information available (see Section 1.2) the character of the baseline and the fact that potentially significant environmental effects on natural heritage, climate change, resource use, cultural resources and people cannot be scoped out. |
| Population | Yes | No | |
| Human health | Yes | No | |
| Soil | Yes | No | |
| Water | Yes | No | |
| Air | Yes | No | |
| Climatic factors | Yes | No | |
| Material assets | Yes | No | |
| Cultural heritage | Yes | No | |
| Landscape | Yes | No | |

Shetland Islands Council considers that the majority of the possible effects identified in Table 3.1, and which have resulted in the topic being scoped in, are controllable provided that sufficiently detailed policies are developed, consistently applied and enforced, in to ensure there is no adverse impact.

The location and design of wind energy developments can have significant adverse effects on the environment and communities (these significant adverse effects may include, for example, impacts on biodiversity, landscape and noise disturbance). This can be mitigated against by ensuring that submissions for planning permission provide sufficient detail to enable full evaluation and assessment of the proposal and developing a suite of policies which require either critical criteria to be met (full protection) or a demonstration by the applicant that their development proposal will not result in adverse impact (medium scale protection).

Shetland Islands Council consider that the development of precise and detailed policies is fundamental, together with consistent decision making in terms of development plan policy, regular monitoring and swift enforcement when necessary.

## 3.3 ENVIRONMENTAL APPRAISAL

The next stages in the SEA process (see Section 1) once the consultation on the Scoping Report has been completed, are the assessment of the effects of the draft WED IPP and the preparation of the Environmental Report.

### 3.3.1 Assessment Methodology

A framework approach will be used to evaluate the effects of the WED IPP. The draft SEA framework (see Table 3.2) has been evolved from the work undertaken during this scoping stage. It is based on the SEA objectives presented in Section 2.4 and Table 2.20 above. A set of appraisal criteria has been developed drawn from the literature, feedback in discussions with SIC, the study team's own experience of other SEAs and plan appraisals. These criteria will be used to focus the appraisal of the WED IPP against the SEA objectives.

**Table 3.2 : Draft SEA Appraisal Framework**

| SEA Topic | SEA Objectives | SEA Questions |
|---|---|---|
| **Biodiversity (Flora and Fauna)** | 1. To further the conservation of biodiversity | • Will the policy cause impacts on plants and animals?<br>• Will the policy cause impacts on protected habitats and species?<br>• Does the policy conserve and protect biodiversity?<br>• Does the policy contribute to the aims of the Local Biodiversity Action Plan?<br>• Does the policy contribute to public awareness and understanding about biodiversity? |
| **Population** | 2. To improve the quality of life for people and communities across Shetland | • Does the policy contribute towards improving quality of life for people and communities across Scotland? |
| **Human Health** | 3. To improve the quality of health in Shetland | • Does the policy contribute towards improving the quality of health associated with the environment (air quality, water quality, noise and vibration)?<br>• Does the policy impact on access to health and care services for Shetland islanders? |
| **Soil** | 4. To protect Shetland's soil resources and use them in a sustainable manner | • Will the policy impact on Shetland's soil resources?<br>• Does the policy protect Shetland's soil resources?<br>• Does the policy encourage the use of them in a sustainable manner? |
| **Water** | 5. To protect and enhance freshwater and marine water quality<br><br>6. To ensure that Shetland's water resources are used effectively and sustainably | • Does the policy pose any risks towards Shetland's freshwater and marine water quality?<br>• Does the policy protect and enhance freshwater and marine water quality?<br>• Does the policy ensure that Shetland's water resources are used effectively and sustainably? |
| **Air** | 7. To protect Shetland's air quality | • Does the policy pose any risks to air quality?<br>• Does the policy encourage activities that could contribute to lowering air quality? |

| SEA Topic | SEA Objectives | SEA Questions |
|---|---|---|
| **Climatic Factors** | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO^2$ reduction target<br><br>9. To adapt to the predicted effects of climate change | • Does the policy help in reducing greenhouse gas emissions?<br>• Does the policy take account of the predicted effects of climate change, and adapt appropriately?<br>• Is the risk or likelihood of flooding of any property, planned or existing, increased?<br>• Will the policy put other assets at risk from flooding?<br>• Will the policy ensure that people and property are protected from flooding? |
| **Material Assets** | 10. To promote the sustainable use of Shetland's natural resources | • Does the policy encourage the sustainable use of natural resources?<br>• Will the policy lead to a reduction in the use of natural resources?<br>• Does the policy encourage the use of local or imported materials?<br>• Will the policy promote or enable greater use of recycling? |
| **Cultural Heritage** | 11. To conserve and protect the historic environment<br><br>12. To conserve and promote the distinctive cultural heritage | • Does the policy impact on the historic environment?<br>• Does the policy conserve and protect the historic environment?<br>• Does the policy help in raising public awareness and understanding of cultural heritage and how the public influence the continuing development of cultural heritage?<br>• Does the policy conserve and enhance cherished aspects of local cultural heritage?<br>• Does the policy contribute to local character, customs and traditions? |
| **Landscape** | 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes<br><br>14. To improve those landscapes and seascapes that are degraded | • Will the policy pose a risk to the landscape and seascape?<br>• Does the policy consider all landscape and seascape implications?<br>• Does the policy contribute to landscape and seascape protection?<br>• Does the policy enhance degraded landscapes and seascapes? |

The SEA framework will be used to predict the potential effects of each WED IPP policy/objective. Best practice guidance on evaluation will be followed and wherever possible the assessment will be quantitative. Effects will be considered in terms of their scale; the sensitivity of the resource; whether the effects are temporary or permanent, positive or negative, direct or indirect and whether there is the potential for effects to build up. Wherever the potential for significant environmental effects is identified the potential for mitigation will be considered.

It is proposed at this stage to use a simple scoring system to assess the policies/objectives against the SEA framework, as set out in Table 3.3 below.

**Table 3.3 SEA Framework Scoring System**

| | |
|---|---|
| Major positive effect | √√ |
| Minor positive effect | √ |
| Neutral effect | **0** |
| Minor negative effect | x |
| Major negative effect | xx |
| Uncertain effect | **?** |

The findings of each assessment will be set out in a matrix table (see *Table 3.4* below). Each will be supported by text as appropriate to ensure that the summaries in the tables are auditable and the methods of assessment transparent. The text will set out where qualitative appraisal only has been possible and what information has been used to inform the findings and recommendations.

In undertaking the final appraisals of residual effects it will be important to take account of the scale and nature of the effects. It will be particularly important to consider the potential for indirect and cumulative effects of policies in the WED IPP. The depth of these analyses will depend on the availability of relevant information. The potential for cumulative effects to arise from WED IPP objectives will be set out in *Table 3.5* (below).

The cumulative environmental effects of the WED IPP will be evaluated in light of the evolution of the environment without the plan, and the net effects identified and reported in the Environmental Report.

**Table 3.4: Example Matrix for Documenting the Assessment of an WED IPP Policy Objective**

| **CONSTRUCTION AND DESIGN IPP Objective: XXX** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **SEA Objective** | **Indicator** | **Summary Baseline** | **Potential Impacts** | **Mitigation** | **Nature of Residual Effect** | **Assessment of Residual Effect** (see Table 3.1 for scoring system) | | | **Comments** |
| | | | | | | **Short term** | **Med term** | **Long term** | |
| | | | | | | | | | **To cover for example:**<br>- Likelihood/certainty of effect occurring<br>- Geographical scale of effect<br>- Whether temporary or permanent<br>- Frequency of effects and potential for reversibility<br>- Assumptions made in assessment<br>- Future opportunities for mitigation<br>- Potential for indirect effects<br>- Potential for secondary effects<br>- Potential for synergistic effects<br>- Potential for cumulative effects<br>- Requirements for consultation<br>- Identification of any partners to deliver mitigation etc<br>- Any recommendations for issues to be considered at different stages of the planning process<br>- Recommendations for data collation<br>- etc |

**Table 3.5 : Matrix for Assessing the Potential for Cumulative Effects of WED IPP Objectives**

| WED IPP Objective | SEA Objective 1 | SEA 2 | SEA 3 | SEA 4 etc |
|---|---|---|---|---|
| **Topic** | **Biodiversity** | **Population** | **Health** | **etc** |
| **1** | | | | |
| **2** | | | | |
| **3 etc** | | | | |
| **Potential for Significant Cumulative Effects and Recommendations for Mitigation or Capturing the Benefit** | | | | |
| **Key: + positive; - negative; o neutral; ? uncertain** | | | | |

### 3.3.2 Establishing the SEA Indicators

The selection of appropriate SEA indicators on which the progress of achieving the SEA objectives and ultimately the effects of the WED IPP can be measured will be undertaken in two stages:

- **Stage 1 –** making an initial selection of potential indicators with reference to those used at the national and local levels in related plans and programmes.
- **Stage 2 –** robustly analysing potential indicators to test their relevancy to SIC activities through a process of detailed consultation with appropriate SIC staff, seeking ideas for changes and modifications in order to create more meaningful indicators and carrying out a "reality" check for the collection and management of data.

The environmental impact of SIC activities in terms of the location, design and construction of future wind energy developments is primarily indirect, in terms of its responsibility for the preparation of both the strategic and detailed policies for determining planning applications for developments within Shetland.

Its direct effects on the key environmental issues (see Section 2.3 above) will therefore tend to come from strategic policies that will influence the location, design and construction of future wind energy developments in Shetland. The indicators, therefore, for measuring and monitoring the environmental effects of SIC activity will be determined through further consultation with SIC but some draft illustrative indicators are presented in Table 3.6.

The indicators would be expected to satisfy the criteria that they should be simple, relevant to SIC activities and be in line with baseline information that was readily accessible. The suggested indicators (see Table 3.6) are specific and relevant to the activities of SIC and are the means by which the delivery of the WED IPP can be best measured (i.e. the intention is that they should be SMART – specific, measurable, achievable, realistic and time-bound).

## Table 3.6: SEA Objectives and Suggested Indicators

| SEA Topic | Objective | Example Indicators (to be developed) |
|---|---|---|
| **Biodiversity (Flora and Fauna)** | 1. To further the conservation of biodiversity | • Number of measures included in planning applications which would benefit biodiversity in short-term and on restoration |
| **Population** | 2. To improve the quality of life for people and communities across Shetland | • Number of applications where visual intrusion, nuisance, community severance, etc could be an issue |
| **Human Health** | 3. To improve the quality of health in Shetland | • Number of complaints regarding traffic and/or dust and emissions from construction or specific developments<br>• Level of severance on local roads |
| **Soil** | 4. To protect Shetland's soil resources and use them in a sustainable manner | • Number of applications in blanket bog, high quality wet or dry heath or improved agricultural land<br>• Number of applications with risk of peat slip resulting |
| **Water** | 5. To protect and enhance freshwater and marine water quality | • Number of surface water bodies affected by applications<br>• Water quality (marine and fresh water) |
| | 6. To ensure that Shetland's water resources are used effectively and sustainably | |
| **Air** | 7. To protect Shetland's air quality | • As Objective 3 |
| **Climatic Factors** | 8. To reduce greenhouse gas emissions in and to contribute to Scotland's 80% $CO^2$ reduction target | • Distance travelled by vehicles accessing new developments<br>• Volume of building materials imported from outside Shetland<br>• Number of applications outwith areas of flood risk |
| | 9. To adapt to the predicted effects of climate change | |
| **Material Assets** | 10. To promote the sustainable use of Shetland's natural resources | • Percentage of recycled building materials used in new developments.<br>• Number of old vacant or derelict areas of land brought back into sustainable use<br>• Area of agricultural land lost to development |
| **Cultural Heritage** | 11. To conserve and protect the historic environment | • Number of development applications affecting historic sites and scheduled monuments (directly and indirectly i.e. effects of setting)<br>• Number of development sites which affect the setting of historic sites and scheduled monuments |
| | 12. To conserve and promote the distinctive cultural heritage | |
| **Landscape** | 13. To protect the special qualities and characteristics of Shetland's landscapes and seascapes | • Number of applications affecting National Scenic Areas and/or areas of recognised local value directly or indirectly<br>• Number of applications affecting unique coastal landscape and seascape<br>• Number of applications affecting 'wild' areas |
| | 14. To improve those landscapes and seascapes that are degraded | |

### 3.3.3 Monitoring

Proposals to monitor the effects of implementing the WED IPP will be identified including how the indicators will be used and the measures to check:

- that the WED IPP is contributing to the achievement of SEA objectives;
- that mitigation measures are performing as well as can be expected or require modifying; and
- whether any remedial measures are necessary to mitigate any adverse significant effects which had not been identified previously.

### 3.3.4 Proposed Structure of the Environmental Report

**Box Draft Structure of the**

The report will broadly follow Scottish Government guidance[7] to ensure that the contents cover the required contents of an SEA Environmental Report and would include:

- An introduction to the report which sets out what it is trying to achieve and signposts in a table where the information required by the SEA Regulations is located;
- The statutory context for the WED IPP;
- The objectives and policies within the WED IPP;
- A description of the assessment methodology;
- A review of the consultation process and the input it has made;
- A review of relevant plans and programmes and how they have influenced the SEA in particular in developing objectives and indicators;
- A description of the relevant environmental baseline highlighting any shortfalls in data;
- The SEA framework including objectives and indicators;
- Description of the key environmental issues identified;
- Assessments of the WED IPP objectives and policies using the SEA framework;
- A description of proposed mitigation measures;
- Proposals for monitoring future effects of the WED IPP; and
- A Non-Technical Summary of the above.

# 4 NEXT STEPS

## 4.1 PROPOSED CONSULTATION METHODS, INPUTS AND TIMESCALES

The following inputs from further consultation are proposed:

- Responses to the WED IPP and Environmental Report consultation processes that include – distribution of hard copies to key stakeholders and publication on the SIC website and any issues relating to environmental problems or issues for the SEA will be taken into account in finalising the WED IPP.

- Further discussion with relevant consultees as and when required in the context of the Scottish Government Consultation Process. The consultation period will run for three months, in line with Scottish Government Guidance.

- The Environmental Report, which will report the findings of the SEA of the WED IPP, will be published for consultation at the same time as the draft WED IPP. This is currently programmed for 24th August 2009, and as stated, is scheduled to last for three months.

## 4.2 ANTICIPATED MILESTONES

The key milestones in the development of the WED IPP and the SEA are as follows:

- Submission of SEA Scoping Report to SEA Gateway in July 2009.

- Preparation of the Environmental Report in July and August 2009.

- Consultation on the draft WED IPP and Environmental Report from August to early October 2009.

- Finalisation of the WED IPP in October 2009.

## 4.3 PROPOSED CONSULTATION TIMESCALES

In terms of section 15(3) of the Act, it is proposed that the Environmental Report will be presented for public consultation. A period of at least six weeks will be allowed for representations to be made in respect of the Environmental Report.

## 4.4 ANTICIPATED MILESTONES IN THE SEA AND PLANNING PROCESSES RELATED TO THE REVIEW

- submit SEA screening report to SEA gateway
- submit SEA scoping report to SEA gateway (5 week consultation period)
- public consultation of draft Environmental Report
- submit draft Environmental Report to SEA gateway with draft Interim Planning Policy
- final adoption of Interim Planning Policy and Environmental Report

# ANNEX A

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# BIBLIOGRAPHY

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Annex D

# Assessment of Cumulative Effects

## D1 Introduction

This Annex summarises the cumulative implications and possible effects associated with the Onshore Wind Energy SG and its objectives under the main SEA issues of:

- Water resources
- Loss of Biodiversity
- Traffic levels and congestion
- Material Assets and Waste Management
- Climatic Factors and Emissions of Greenhouse Gases
- Historic and cultural heritage

The table outlines the context of the issue, any cumulative and synergistic impacts, the likely receptors, how the Onshore Wind Energy SG influences the issue and gives examples of mitigation to ameliorate the impact.

**Table E1 Cumulative Effects**

| Key Environmental Issue | Causes | Cumulative and/or Synergistic Effects | Affected Receptor | Influence of the Onshore Wind Energy SG | Potential mitigation |
|---|---|---|---|---|---|
| **Water Resources (water use and water quality impacts)** | Issues could arise with regard to surface water management around developments during construction, operation and maintenance that could lead to a wider pollution load to local streams and lochans.<br><br>The specific design of wind energy development and its associated infrastructure will have a bearing on the hydrological regime and this will need to be considered as part of each EIA. | Large scale wind energy developments or increasing numbers of smaller developments together with the growth in housing and other commercial developments could lead to an increased demand for, and pressure on water resources so making those water resource assets gain even greater importance in ensuring a sustainable supply of water to Shetland communities.<br><br>There may be additional risks for surface and groundwater. If more infrastructure is needed this could put costs up for Scottish Water and in turn for the consumer. | Controlled waters (rivers, streams groundwaters and coastal waters), habitats and biodiversity, water companies and consumers. | Drainage and design of wind energy development and its associated infrastructure could impact on water resources and put pressure on the current surface water regime through increased run-off and sedimentation.<br><br>The Onshore Wind Energy SG does place an emphasis on the prevention of adverse impacts on water resources and the protection of water quality. | Application of the LDP RE1 Renewable Energy policy, SG Development Criterion 5 –Water Resources and in conjunction with the overarching LDP policies that set out broad requirements for implementing sustainable development, water and drainage and waste management measures (e.g. PoliciesGP1-GP3 (General Policies), W1-W5 (Waste) and WD1-WD3 (Water and Drainage) )should provide adequate measures to address these issues.<br><br>Existing water pollution control legislation as administered by SEPA should also provide for adequate protection of controlled waters. |

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|---|---|---|---|---|---|
| **Threats to Designated Areas for Nature Conservation and possible loss of biodiversity and geodiversity** | Development can impact or put pressure on areas of international (SPA, SAC and Ramsar sites), national (SSSIs) and local nature conservation importance. Similarly impact and pressure may be placed on sites of geodiversity interest. All of these areas of conservation importance may be coastal marine sites as well as inland areas. The threats may come directly or indirectly (cumulatively) by adding to the pressures already starting to build up.<br><br>Threats to biodiversity may not just be restricted to conservation areas but also in the wider rural and island environment including areas of recreational amenity value to local communities. | There will be the potential to disturb, remove and replace habitats or areas of geodiversity interest as well as associated flora and fauna (possibly including protected species) at the sites of development and then depending on their location there could be indirect negative impacts on nearby sites of conservation importance.<br><br>There may also be risks of possible fragmentation of habitats and destruction or interruption of wildlife corridors caused by the location of wind turbines or associated access tracks.<br><br>Indirect effects of further development in sensitive areas could result from increases in traffic associated with developments (during construction, operation and maintenance) and the disturbing impacts that this could have on biodiversity.<br><br>Cumulative effects could arise from the construction of roads, access tracks and other infrastructure that would arise as a consequence of the development. | Land take, local ecology, biodiversity, geodiversity and public amenity | Additional wind energy development together with the construction of any associated energy transmission infrastructure could lead to adverse impacts on biodiversity and geodiversity.<br><br>The influence of the Onshore Wind Energy SG (with appropriate development criteria) could be beneficial if the policies and criteria are applied vigorously not only to protect biodiversity and geodiversity but also to enhance it where appropriate. | The rigorous application of LDP policies that focus on protecting designated sites (such as NH1 and NH4) together with those within the Onshore Wind Energy SG that provide a degree of protection (SG DC3 Natural Heritage) should all ensure mitigation is provided for possible effects. |

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| **Climatic Factors**<br><br>**Including:**<br><br>• **Traffic and transport**<br>• **Embodied carbon** | Increases in the number of wind energy developments could add to traffic pressures and lead to an increase in the number of vehicles on the road primarily due to construction traffic but also from maintenance operations.<br><br>The fabrication of wind turbines will involve material supply and manufacturing processes that will inevitably lead to carbon emissions and therefore an embodied carbon footprint for these construction materials. | Increases in road traffic and fossil fuel operated plant and equipment will inevitably lead to increases in emissions and risks of associated atmospheric pollution.<br><br>Increased construction traffic can create additional noise, vibration and other nuisances that together with emissions will affect local residents close to roads and general amenity in the near vicinity. Increases in emissions, noise and vibration are likely to have a negative impact on human health, biodiversity, the historic and built environment, and the general image and amenity value of the areas affected.<br><br>Increased vehicle exhaust emissions will also increase the amount of $CO_2$ emitted, thus adding to the Scottish contribution of greenhouse gas emissions and contributions to climate change.<br><br>Use of materials with a high embodied energy and carbon footprint will add further to the Scottish contribution of greenhouse gas emissions. | Global atmosphere<br><br>Air quality<br><br>Local residents and communities<br><br>Biodiversity<br><br>Historic and built environment<br><br>Local amenity and image | Additional wind farm developments in Shetland will inevitably bring with them increased construction traffic and associated operational maintenance traffic. This potential increase in traffic will contribute transport related emissions (e.g. noise, vibration, dust and exhaust emissions) the impact of which will depend on the size of the development.<br><br>The Onshore Wind Energy SG recognises this and in particular under DC4 Impacts on Communities 16 – sets out criteria and developer requirements that would protect against such potentially adverse effects.<br><br>The Onshore Wind Energy SG does not include any provisions for addressing embodied energy and carbon in construction materials and the knock-on environmental effects of these contributions to carbon emissions. | Application of Onshore Wind Energy SG DC4 Impacts on communities, together with other elements of the SG as a whole, whilst not entirely removing the threats posed by increased traffic could substantially reduce them and in conjunction with the overarching LDP policies that set out broad requirements for implementing sustainable development, protecting natural heritage, transport options and renewable energy technology (GP1, GP2, NH1, NH3, TRANS1 and RE1)<br><br>The Onshore Wind Energy SG requires to consider the carbon balance of onshore wind energy developments and provide evidence of their overall benefit |

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| **Waste management** | The development of wind farms will inevitably lead to waste being generated during the construction phase and ongoing waste generation from maintenance activities.<br><br>Legislation will continue to put pressure on land filling of waste and encourage the search for alternative disposal routes.<br><br>There will be further pressure to prevent or reduce waste generated in the first place and to minimise and recycle all forms of waste. | More wind energy developments are likely to increase the volumes of waste generated, particularly during the construction phase. This, in turn, will exacerbate the already present challenges of waste minimisation and management.<br><br>Increases in waste in Shetland will put pressure on the search for more sustainable waste disposal and management solutions.<br><br>In the short term there may be more pressure on local land fill sites adding to the burden of possible contaminated land, groundwater (from leachate) and atmospheric pollution (from methane generation). There may also be knock-on effects on local biodiversity.<br><br>There may be a rise in vehicle use associated with increases in the collection and transportation of waste. | Land take<br>Habitats and biodiversity<br><br>Air quality (methane, climate change, human health)<br><br>Roads<br><br>Local people and communities | The supporting framework for further wind energy development set out in the SG is likely to result in an increase in the number of developments and as a consequence an increase in the volumes of waste generated, which in turn will exacerbate the problems of waste minimisation and management in Shetland.<br><br>Although not directly addressed in the SG, it does provide general support for addressing waste issues, though this is addressed more fully in the LDP (LDP policies W1-W5). | Application of the waste policies in the LDP (W1 Waste Hierarchy, W2 Waste Management Facilities and W5 Waste Management Plans and facilities in all new developments) should provide adequate mitigation to address waste in relation to wind energy development. |

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| **Historic and cultural Heritage** | Increasing numbers of wind farm developments in Shetland could put increasing pressure on historic sites, buildings, monuments and archaeological sites and their settings. | Wind energy developments and associated infrastructure if poorly located could cause the removal or irreversible damage to historic sites, archaeological remains, valuable buildings, monuments or heritage assets.<br>An individual small-scale development (e.g. up to six turbines) may not in isolation create a significant adverse effect but large-scale wind farms (e.g. in excess of 100 turbines) or the combination of several smaller ones could affect the setting of historic sites and features. | Archaeological sites, Buildings,<br><br>Historic sites<br><br>Public amenity<br><br>Local residents and communities. | The Onshore Wind Energy SG contains a specific Criterion – number 4 that focuses entirely on the protection of the historic and archaeological environment. There is a clear recognition of the significance of Shetland's historic and archaeological heritage and therefore of the need to afford protection from the potential adverse impacts from wind energy developments. | Application of the full Onshore Wind Energy SG and in particular DC7 Historic Environment, together with LDP policies HE1 Historic Environment, HE2 Listed Buildings, HE4 Archaeology, HE5 Gardens and Designed Landscapes and HE6 Trees and Woodlands should provide the necessary mitigation. |
| **Landscape and Seascape** | Increasing numbers of wind farm developments in Shetland could put increasing pressure on the natural landscape and seascape eventually causing significant adverse impacts. The problem is exacerbated by the relatively flat topography and lack of trees to provide any visual protection or screening | Poorly located wind energy development and associated infrastructure could create significant adverse impacts on the Shetland landscape and seascape.<br><br>Individual small-scale developments (e.g. up to 6 turbines) may not in isolation create a significant adverse effect and may be relatively easily accommodated but large scale wind farms (e.g. over 100 turbines) or the combination of several smaller ones could affect significantly the landscape character, and impact on views across Shetland. | Landscape and seascape character of Shetland<br><br>Local residents and communities<br><br>Tourists and visitors | The Onshore Wind Energy SG contains a specific Criterion – DC1 Landscape and Visual Impact - that focuses entirely on safeguarding the landscape of Shetland.<br><br>There is a clear recognition of the significance of the unique Shetland landscape and seascape and therefore of the need to afford protection from the potential adverse impacts that wind energy developments could create. | Application of the full Onshore Wind Energy SG and especially DC1 Landscape and Visual Impact, together with LDP policies NH4 Local Designations and the overarching LDP policies that set out broad requirements for implementing sustainable development GP1 Sustainable Development, GP2 General Requirements for All Development and GP3 All Development: Layout and Design should provide the necessary mitigation. |