

**STRATEGIC ENVIRONMENTAL ASSESSMENT OF THE ORKNEY ISLANDS INTER-ISLES CONNECTIVITY STRATEGY**  
**APPENDIX A: Table 5 Relevant plans, programmes and strategies (PPS) and environmental protective objectives, and their relationship with the Orkney Islands Inter-isles Connectivity Strategy**

**TABLE 5 REVIEW OF INTERNATIONAL AND EUROPEAN POLICY**

<b>Name of PPS/ environmental protection objective</b>	<b>Title of legislation and main requirements of PPS / Environmental protection objective</b>	<b>How it affects, or is affected by, The Strategy in terms of SEA issues* at Schedule 3 of the Environmental Assessment (Scotland) Act 2005</b>
UN Framework Convention on Climate Change & its Kyoto Protocol	Energy Act 2004 The UN Framework Convention on Climate Change was established in 1992 as an international framework to agree strategies to reduce emissions of greenhouse gases in relation to their impact on global climate. The Kyoto Protocol established a timetable for reduction in the emissions of these gases as well as a framework for sequestration of carbon by vegetation.	Climatic factors and local air quality. Sets CO <sub>2</sub> reduction targets that the Strategy needs to take into account.
Water Framework Directive (2000/60/EC)(WFD)	The Water Environment & Water Services (Scotland) Act 2003. The Water Framework Directive establishes a new legal framework for the protection, improvement and sustainable use of surface waters, transitional waters, coastal waters and groundwater across Europe.	Water, soil and biodiversity. Sets targets for the chemical and ecological quality of water bodies that the Strategy must take into account.
Groundwater Directive 80/68/EEC (Expected to be revoked by the Water Framework Directive in 2013)	The Groundwater Regulations 1998  The prevention of pollution or over-abstraction of groundwater.	Water. The Regulations list substances which, based on toxicity, persistence or potential for bioaccumulation, either should not be allowed to enter the groundwater or should only be permitted for discharge subject to prior investigation. The potential for producing substances on these lists should be considered in the Strategy.
Conservation of Wild Birds Directive 79/409/EEC Conservation of Natural Habitats and of Wild Fauna and Flora Directive 92/43/EEC	The Wildlife & Countryside Act 1981 (as amended) The Conservation (Natural Habitats & c.) Regulations 1994 The Nature Conservation (Scotland) Act 2004 Conservation and management of, and human interactions with, wild birds in Europe. The protection of natural habitats and certain species of wild plants and animals.	Local air quality, water, soil, climatic factors and biodiversity.  The Strategy must take into account the potential impact of its implementation on the habitats and species of sites designated due to their natural heritage value.

\* Climatic effects; Local air quality; biodiversity; water; soil; geology; landscape; cultural heritage (including architectural and archaeological heritage); population; human health; material assets; noise; inter-relationship between these issues; secondary and cumulative effects.

**TABLE 5.1 REVIEW OF INTERNATIONAL AND EUROPEAN POLICY**

<b>Name of PPS/ environmental protection objective</b>	<b>Title of legislation and main requirements of PPS / Environmental protection objective</b>	<b>How it affects, or is affected by, The Strategy in terms of SEA issues* at Schedule 3 of the Environmental Assessment (Scotland) Act 2005</b>
EU Sustainable Development Strategy	<p>The Wildlife &amp; Countryside Act 1981 (as amended)                      The Conservation (Natural Habitats &amp; c.) Regulations 1994                      The Nature Conservation (Scotland) Act 2004                      The Water Environment &amp; Water Services (Scotland) Act 2003                      The Environmental Protection Act 1990                      The Air Quality Limit Values (Scotland) Regulations 2003                      Energy Act 2004</p> <p>The strategy has identified seven key challenges and corresponding targets, objectives and actions:</p> <ul style="list-style-type: none"> <li>• Climate change and clean energy</li> <li>• Sustainable transport</li> <li>• Sustainable consumption and production</li> <li>• Conservation and management of natural resources</li> <li>• Public health</li> <li>• Social inclusion, demography and migration</li> <li>• Global poverty and sustainable development challenges.</li> </ul>	<p>Local air quality, water, soil and geology, climatic factors, biodiversity, health, population and material assets.</p> <p>The Strategy must consider its potential impact on the environmental, social and economic aspects of development.</p>
The Biofuels Directive 2003/30/EC	This directive has a target for biofuels to form at least 5% of transport fuels by 2010.	<p>Climatic factors                      The Strategy must make provision to be able to meet this target by 2010.</p>
Environmental Noise Directive 2002/49/EC	<p>The Environmental Noise (Scotland) Regulations 2006                      The aim of the END is to define a common approach across the European Union with the intention of avoiding, preventing or reducing on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise</p>	<p>Noise</p> <p>The Strategy must consider its effect on environmental noise levels.</p>
Air Quality Directive 2004/107/EC	<p>The Air Quality Limit Values (Scotland) Regulations 2003.                      Sets new air quality standard for pollutants which include sulphur dioxide, nitrogen dioxide, particulate matter, lead and ozone pollutant.</p>	<p>Air                      Sets new air quality standards for pollutants which were previously unregulated and which the Strategy needs to consider. These include sulphur dioxide, nitrogen dioxide, carbon monoxide, particulate matter, lead and ozone pollutant.</p>

\* Climatic effects; Local air quality; biodiversity; water; soil; geology; landscape; cultural heritage (including architectural and archaeological heritage); population; human health; material assets; noise; inter-relationship between these issues; secondary and cumulative effects.

**TABLE 5.2 REVIEW OF NATIONAL POLICY**

<b>Name of PPS/ environmental protection objective</b>	<b>Title of legislation and main requirements of PPS / Environmental protection objective</b>	<b>How it affects, or is affected by, The Strategy in terms of SEA issues* at Schedule 3 of the Environmental Assessment (Scotland) Act 2005</b>
The Air Quality Strategy for England, Scotland, Wales and Northern Ireland	The Air Quality Limit Values (Scotland) Regulations 2003 Sets new air quality standard for pollutants which include sulphur dioxide, nitrogen dioxide, particulate matter, lead and ozone pollutant. The ultimate objective of the UK Government and the devolved administrations is to 'render pollution emissions harmless'.	Local air quality. Sets new air quality standard for pollutants which were previously unregulated and which the LTS needs to consider. These include sulphur dioxide, nitrogen dioxide, carbon monoxide, particulate matter, lead and ozone pollutant.
The UK's Shared Framework for Sustainable Development (2005)	The Wildlife & Countryside Act 1981 (as amended) The Conservation (Natural Habitats & c.) Regulations 1994 The Nature Conservation (Scotland) Act 2004 The Water Environment & Water Services (Scotland) Act 2003	Local air quality, water, soil and geology, climatic factors, biodiversity, health, population, cultural heritage and material assets.
Meeting the Needs. Priorities, Needs, Actions and Targets for Sustainable Development in Scotland (2002)	The Environmental Protection Act 1990 The Air Quality Limit Values (Scotland) Regulations 2003 Energy Act 2004 Priorities identified for immediate action are: <ul style="list-style-type: none"> <li>• sustainable production and consumption;</li> <li>• climate change and energy;</li> <li>• natural resource protection and environmental enhancement; and</li> <li>• sustainable communities</li> </ul> Priorities outlined for Scotland are: <ul style="list-style-type: none"> <li>• <u>Resource use</u>: to understand where our materials come from, how they are replaced, what happens to the community which supplied them, how they were brought to our use and how they went to their next use.</li> <li>• <u>Energy</u>: To generate less energy and use less power from renewable sources.</li> <li>• <u>Transport</u>: to encourage better land use planning, alternative service delivery and sustainable transport systems.</li> </ul>	The Strategy must support the economic and social aspects of development by promoting means of transport which are also increasingly environmentally sustainable.  The UK's Shared Framework for Sustainable Development includes indicators for monitoring key issues on a UK basis. Some of these indicators will be used to assess the Strategy.

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**TABLE 5.2 REVIEW OF NATIONAL POLICY**

<b>Name of PPS/ environmental protection objective</b>	<b>Title of legislation and main requirements of PPS / Environmental protection objective</b>	<b>How it affects, or is affected by, The Strategy in terms of SEA issues* at Schedule 3 of the Environmental Assessment (Scotland) Act 2005</b>
The National Waste Strategy (Scotland)	The Environmental Protection Act 1990 This strategy provides a framework within Scotland to reduce the amount of waste which it produces and deal with the waste which has been produced in more sustainable ways. The vision is for a resource-efficient culture where waste reduction, reuse and recycling are part of everyday life for everyone.	Water, soil, geology and local air quality.  Where possible waste produced by transport activities will be recycled. Where this proves impossible, waste will be disposed of by the correct means.
Scotland's Transport Future: The Transport White Paper (2004)	The Transport (Scotland) Act 2001 This document sets out the Scottish Executive's ambitions for improving the planning and delivery of transport at a local, regional and national level.	Local air quality, water, soil and geology, climatic factors, biodiversity, landscape, health, population and material assets. The Strategy will be guided by the environmental protection objectives of The Transport White Paper.
The National Transport Strategy	The Transport (Scotland) Act 2001 The National Transport Strategy will guide policy formulation and investment over the next 20 years to around 2025. Throughout its lifetime the national transport strategy will act as a reference point for all those who wish to contribute to transport policy.	Local air quality, water, soil and geology, climatic factors, biodiversity, landscape, health, population and material assets.  The Strategy will be guided by the principles which underpin the National Transport Strategy
SPP1 The Planning System	Town and Country Planning (Scotland) Act 1997 Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 SPP1 provides an overview of the current land use planning system in Scotland and presents the key principles and the Executive's priorities for the system to guide policy formulation and decision making towards the goal of sustainable development.	Local air quality, water, soil and geology, climatic factors, biodiversity, landscape, health, population and material assets.  SPP1 sets out how the planning system can encourage more sustainable travel patterns and hence reduce harmful atmospheric emissions.
SPP2 Economic Development	Town and Country Planning (Scotland) Act 1997 This SPP focuses on four themes where planning can contribute to economic development: <ul style="list-style-type: none"> <li>• Providing a range of development.</li> <li>• Securing new development in sustainable locations – to improve integration between transport and locations for development and to encourage more sustainable forms of development.</li> <li>• Safeguarding and enhancing the environment.</li> <li>• Promoting a dialogue between councils and business.</li> </ul>	Local air quality, water, soil and geology, climatic factors, biodiversity, landscape, health, population and material assets.  The Strategy features the following strategic planning objectives: <ul style="list-style-type: none"> <li>• Facilitate more frequent and faster connections for work and non-work purposes</li> <li>• Facilitate more tourist travel to the isles</li> <li>• Reduce business costs and improve business efficiency</li> <li>• Increase connectivity to the Orkney Mainland.</li> </ul>

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<b>Name of PPS/ environmental protection objective</b>	<b>Title of legislation and main requirements of PPS / Environmental protection objective</b>	<b>How it affects, or is affected by, The Strategy in terms of SEA issues* at Schedule 3 of the Environmental Assessment (Scotland) Act 2005</b>
SPP7 Planning and flooding (2004) and PAN61 Planning and Sustainable Urban Drainage Systems (2001)	Town and Country Planning (Scotland) Act 1997 SPP7 aims to prevent further development, which would have a significant probability of being affected by flooding, or which would increase the probability of flooding elsewhere. Flood prevention and alleviation measures should respect wider environmental concerns and not lead to deterioration in the ecological status of the watercourse. Sustainable drainage will be required whenever practicable and watercourses should not be culverted.	Water, soil and geology and biodiversity.  Sustainable drainage and alternatives to culverting will be considered when planning any construction works.
SPP15 Planning for Rural Development (2005)	Town and Country Planning (Scotland) Act 1997 The overarching aim is to have a more prosperous rural economy, with a stable or increasing population that is more balanced in terms of age structure and where rural communities have reasonable access to good quality services. It is imperative to ensure that environmental aspects of regeneration do not fall behind economic and social aspects.	Local air quality, water, soil and geology, climatic factors, biodiversity, landscape, health, population and material assets. The Strategy features the following strategic planning objectives: <ul style="list-style-type: none"> <li>• Facilitate more frequent and faster connections for work and non-work purposes</li> <li>• Facilitate more tourist travel to the isles</li> <li>• Reduce business costs and improve business efficiency</li> <li>• Increase connectivity to the Orkney Mainland.</li> </ul>
SPP17  PAN75 Planning for Transport	Town and Country Planning (Scotland) Act 1997 Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 The vision for transport outlined in these documents is of ‘a Scotland where the economy can flourish and communities can function without significant environmental and social problems arising from car dependence, traffic congestion and pollution’.	Population, health, local air quality, water, soil and biodiversity.  The Strategy seeks opportunities to improve the connectivity of the transport network to the North and South Isles of Orkney, whilst also considering its impact on the environment.
SPPG6 Renewable Energy (2007)	Town and Country Planning (Scotland) Act 1997 The Energy Act 2004 SPPG6 is set against the background of the Government’s energy policy and, within it, the policy for renewables and the Scottish Executive’s commitment to the implementation of that policy in Scotland. Increasing the proportion of energy supply from renewables is seen as an important contribution to meeting UK targets for reducing its output of greenhouse gases.	Climatic factors and local air quality.  The Strategy will promote the use of alternative fuels where possible.

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<p>NPPG5 Archaeology and Planning</p> <p>PAN 42 Archaeology – The Planning Process and Scheduled Monument Procedures</p>	<p>The Ancient Monuments and Archaeological Areas Act 1979 The Protection of wreck Act 1973 The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997</p> <p>As part of its intention to work towards sustainable development, the Government seeks to encourage the preservation of our heritage of sites and landscapes of archaeological and historic interest, so that they may be enjoyed today and passed on in good order to future generations. Planning authorities and all parties involved in development should regard archaeological remains as a finite and fragile resource and should safeguard the integrity of the setting of archaeological sites.</p>	<p>Cultural heritage, water, soil and geology, landscape and material assets.</p> <p>The key environmental objective of the legislation and policy framework is <i>‘to protect and, where appropriate, enhance the historic environment’</i>. This objective will be taken into account by the Strategy.</p>
<p>NPPG18 Planning and the Historic Environment</p>		
<p>Scottish Historic Environment Policy 2. Scheduling: protecting Scotland’s nationally important monuments</p>		
<p>Passed to the Future (Historic Scotland’s policy for the sustainable management of the historic environment.</p>		
<p>Memorandum of Guidance on Listed Buildings and Conservation Areas, Historic Scotland 1998</p>		

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<b>Name of PPS/ environmental protection objective</b>	<b>Title of legislation and main requirements of PPS / Environmental protection objective</b>	<b>How it affects, or is affected by, The Orkney Islands Local Transport Strategy in terms of SEA issues* at Schedule 3 of the Environmental Assessment (Scotland) Act 2005</b>
NPPG10 Planning and Waste Management	Town and Country Planning (Scotland) Act 1997 The waste hierarchy favours prevention over reuse, recycling, recovery then disposal, thus guiding choices about waste management options. Once waste is disposed of it should not endanger human health or harm the environment, pose a risk of pollution or nuisance or adversely affect the countryside or places of special interest.	Local air quality, water, soil and geology and material assets. Where possible waste produced by transport activities will be recycled. Where this proves impossible, waste will be disposed of by the correct means.  Where dredging proves necessary, where possible, dredge spoil will be re-used. Where this proves unfeasible it will be disposed of to a site where it will neither impact upon vulnerable marine habitats and species nor on the activities of other users of the marine environment.
NPPG13 Coastal Planning	Town and Country Planning (Scotland) Act 1997 NPPG13 aims to: <ul style="list-style-type: none"> <li>• set out how planning can contribute to achieving sustainable development and also maintaining and enhancing biodiversity on the coast;</li> <li>• highlight the need to distinguish between policies for the developed, undeveloped and isolated coast;</li> <li>• indicate how planning authorities would respond to the risk of erosion and flooding in the coastal zone; and</li> <li>• outline policy guidance for developments which may require a coastal location.</li> </ul> Pressures from the increased accessibility of the coast must be managed in order to minimize impact on the coastal environment.	Water, soil and geology, biodiversity, landscape, population, cultural heritage and material assets. The Strategy will refer to the guidance contained in NPPG13.  NPPG13 sets out the Government’s view on how the planning system can contribute to Coastal Zone Management and highlights the need to consider the implications for dealing with coastal erosion, both when planning any new transport developments but also when maintaining the existing road infrastructure. It recommends that planning authorities should consider preparing, with advice from specialist sources, non-statutory shoreline management plans.
NPPG14 Natural Heritage	Town and Country Planning (Scotland) Act 1997  NPPG14 gives guidance on how the Government’s policies for the conservation and enhancement of Scotland’s natural heritage should be reflected in land use planning.	Water, soil and geology, landscape and biodiversity.  In carrying out its objectives the Strategy will consider the guidance contained in NPPG14.

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NPPG 17 on Transport and Planning	Town and Country Planning (Scotland) Act 1997 (NPPG) 17 on Transport and Planning – sets out Government’s commitment to promote sustainable patterns of development through an integrated approach to land use, economic development, transport and the environment.	Local air quality, water, soil and geology, landscape, population, health, biodiversity and cultural heritage. The Strategy includes objectives to...
SEPA Policy on the Culverting of Watercourses	The Water Environment & Water Services (Scotland) Act 2003 In many cases unnecessary damage to river channels can result from culverting schemes. SEPA’s policy sets out the environmental issues associated with culverting and sets out a consistent and pragmatic approach to this aspect of river engineering. For the purposes of this policy culverts are defined as a variety of artificial channels which may, or may not, be totally enclosed.	Biodiversity, water, soil and geology.  It is unlikely that objectives of the Strategy will result in culverting work but, should it be necessary, this policy will be considered.
Changing Our Ways, Scotland’s Climate Change Programme (2006)	The Energy Act 2004 Scotland’s Climate Change Programme demonstrates how Scotland will deliver carbon savings from devolved policy measures and reduce its vulnerability to the changing climate. Transport objectives include: <ul style="list-style-type: none"> <li>• Consulting on climate change targets for the transport sector as part of the National Transport Strategy.</li> <li>• Consulting on and deciding on the continuation of the existing traffic stabilization target as part of the development of the National Transport Strategy.</li> <li>• Continuing to support UK development work on the implementation of a Renewable Transport Obligation (RTFO) to ensure that 5% of all UK fuels sold on UK forecourts are biofuels by 2010.</li> <li>• Continuing to support developments at UK and international level to promote new and cleaner vehicle technologies and fuels.</li> <li>• Awarding Regional Transport Partnerships £500,000 per year for 2006-08 for the appointment of travel plan officers for the promotion and development of sustainable travel.</li> <li>• Continuing to promote travel behaviour change and modal shift to more sustainable travel modes.</li> </ul>	Climatic factors and local air quality.  The Programme sets carbon savings targets that the Strategy needs to take into account.

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Scottish Executive Marine & Coastal Strategy (2005)	<p>The Energy Act 2004 The Nature Conservation (Scotland) Act 2004 The Water Environment &amp; Water Services (Scotland) Act 2003 Scottish Executive’s vision is of a clean, healthy, safe, productive and biologically diverse marine and coastal environment, which is managed to meet the long-term needs of nature and people. The strategy aims to provide a strategic analysis of existing marine activities and provision of a better understanding of environmental capacity, spatial planning issues, current pressures and how the marine environment can be managed in the future.</p>	<p>Water, soil and geology, biodiversity, landscape, population, cultural heritage and material assets.</p> <p>The Strategy will consider the guidance contained in these Acts in the daily provision of ferry services.</p>
	<p>Disability Discrimination Acts 1995 and 2005</p> <p>The 1995 act aimed to end the discrimination that many disabled people face. The Act gives disabled people rights in the areas of:</p> <ul style="list-style-type: none"> <li>• employment</li> <li>• education</li> <li>• access to goods, facilities and services</li> <li>• buying or renting land or property</li> </ul> <p>The Act also sets minimum standards so that disabled people can use public transport easily.</p> <p>The 2005 Act amends or extends existing provisions in the DDA 1995 including:</p> <ul style="list-style-type: none"> <li>• making it unlawful for operators of transport vehicles to discriminate against disabled people</li> <li>• ensuring that discrimination law covers all the activities of the public sector</li> <li>• requiring public bodies to promote equality of opportunity for disabled people</li> </ul>	<p>Human health and population</p> <p>The Strategy aims to promote accessibility for all.</p> <p>The propose new Outer North Isles vessels take account of regulatory requirements for domestic passenger vessels and will deliver significant improvements to passenger comfort and the physical accessibility of the vessels.</p>

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<p>Scottish Biodiversity Strategy</p>	<p>Nature Conservation (Scotland) Act 2004                      The Wildlife &amp; Countryside Act 1981 (as amended)                      The Conservation (Natural Habitats &amp; c.) Regulations 1994                      ‘Scotland’s Biodiversity: It’s in your hands’ sets out a vision for the future health of our biodiversity, and maps out a 25 year framework for action to conserve and enhance biodiversity for the health, enjoyment and well-being of the people of Scotland. Its vision is:  <i>‘It’s 2030: Scotland is recognized as a world leader in biodiversity conservation. Everyone is involved; everyone benefits. The nation is enriched.’</i> .....and its aim is:  <i>‘To conserve biodiversity for the health, enjoyment and wellbeing of the people of Scotland now and in the future.’</i>                      This aim is underpinned by four objectives:</p> <ul style="list-style-type: none"> <li>• to halt loss of biodiversity and continue to reverse previous losses through targeted action for species and habitats;</li> <li>• to increase awareness, understanding and enjoyment of biodiversity in all our urban, rural and marine environments through better planning, design and practice;</li> <li>• To develop an effective management framework that ensures biodiversity is taken into account in all decision making; and</li> <li>• To ensure that the best new and existing knowledge on biodiversity is available to all policy makers and practitioners.</li> </ul>	<p>Air, water, soil and geology, climatic factors, landscape, population, health and biodiversity.</p> <p>The Strategy will ensure that biodiversity is taken into account in fulfilling its objectives.</p>

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**TABLE 5.3 REVIEW OF LOCAL POLICY**

Name of PPS/ environmental protection objective	Title of legislation and main requirements of PPS / Environmental protection objective	How it affects, or is affected by, The Strategy in terms of SEA issues* at Schedule 3 of the Environmental Assessment (Scotland) Act 2005
HITRANS Partnership Regional Transport Strategy	<p>The Transport (Scotland) Act 2005</p> <p>The Partnership’s vision for the region is to enhance the region’s viability. From the vision a common theme emerges to improve interconnectivity of the region to strategic services and destinations. Then, the Partnership’s desirable outcomes for the region are to:</p> <ul style="list-style-type: none"> <li>• Enable the region to compete and to support growth.</li> <li>• Enable the people of the region to participate in everyday life;</li> <li>• Improve the safety and security of travel</li> <li>• Manage the impacts of travel on the region’s assets</li> <li>• Improve the health of the region’s people.</li> </ul>	<p>Air, water, soil and geology, climatic factors, biodiversity, landscape, health, population, cultural heritage and material assets.</p> <p>The Orkney Islands Inter-isles Connectivity Strategy will feed into and from the HITRANS Partnership Regional Transport Strategy.</p>
A Smart, Successful Highlands and Islands, 2005	<p>A Smart, Successful Highlands and Islands, an enterprise strategy for the Highlands and Islands, was launched in 2005 by Highlands and Islands Enterprise (HIE). The expressed aim is: <i>‘to enable people living in the Highlands and Islands to realize their full potential on a long-term sustainable basis’</i></p> <p>This will be realised by pursuing four strategic objectives:</p> <ul style="list-style-type: none"> <li>• Strengthening communities.</li> <li>• Developing skills.</li> <li>• Growing businesses.</li> <li>• Making global connections.</li> </ul>	<p>Health, population, cultural heritage and material assets.</p> <p>The latter objective is relevant to the Strategy, and priorities for action on this objective include improving connectivity of the Isles with the Orkney Mainland and beyond.</p>
OIC 2020 Community Plan (2003)	<p>Town and Country Planning (Scotland) Act 1997</p> <p>Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997</p> <p>Nature Conservation (Scotland) Act 2004</p> <p>The Wildlife &amp; Countryside Act 1981 (as amended)</p> <p>The Conservation (Natural Habitats &amp; c.) Regulations 1994</p> <p>The Water Environment &amp; Water Services (Scotland) Act 2003</p> <p>The Environmental Protection Act 1990</p> <p>The Air Quality Limit Values (Scotland) Regulations 2003</p> <p>Energy Act 2004</p> <p>The community plan for Orkney, Orkney 2020 articulates the vision of the Orkney Community Planning Framework and its three advisory groups.</p>	<p>Air, water, soil and geology, climatic factors, biodiversity, landscape, health, population, cultural heritage and material assets.</p> <p>The ideal for Orkney is: <i>‘to have a place within a caring community, living in a healthy environment, supported by a thriving economy.’</i></p> <p>The Strategy outlines the desired improvements to the inter-isles transport systems. Transport is an enabler to achieving the three key principles underpinning the ideal for Orkney:</p>

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<p>OIC Corporate Strategic Plan 2005 - 2008</p>	<p>The Corporate Strategic Plan focuses on how it will improve services within Orkney and provides a link between the decisions which are made in the council chamber, the everyday work of the Council, and the community. The aims of the Plan are:</p> <ul style="list-style-type: none"> <li>• <u>Governance</u> – that all Council affairs are conducted in accordance with its corporate strategic objectives and in a manner consistent with the principles of openness and accountability whilst promoting excellence, efficiency and innovation in the provision of public services.</li> <li>• <u>Survival</u> – that Orkney’s interests are pursued to the highest level, maintaining the viability of fragile communities as places where people can live and work, so changes and developments act for the benefit of all Orkney.</li> <li>• <u>Social inclusion</u> – that Orkney’s people are protected and the opportunities for individuals maximised, through the removal of barriers to inclusion.</li> <li>• <u>Sustainability</u> – that Orkney’s communities are strengthened, sustained, developed and promoted; meeting the needs of the present without compromising benefits for future generations.</li> </ul>	<p>Air, water, soil and geology, climatic factors, biodiversity, landscape, health, population, cultural heritage and material assets.</p> <p>Of the Nine Key Priorities for Action two have specific relevance to the Strategy. These are:</p> <ul style="list-style-type: none"> <li>• Pursue the development of an integrated transport infrastructure which is economically, socially and environmentally sustainable.</li> <li>• Progress modernisation of services in pursuit of continuous improvement in efficiency and best practice.</li> </ul>
<p>OIC Structure Plan (adopted 2001 and covering the 10-year period until 2011)</p>	<p>Town and Country Planning (Scotland) Act 1997            Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997</p> <p>The Orkney Islands Council Structure Plan sets out the strategic framework for the development of land in the County over the 10-year period. It aims to assist in the creation of an economically, environmentally and socially sustainable set of individual island communities by supporting development which provides opportunities for:</p> <ul style="list-style-type: none"> <li>• Promoting economic growth and access to a range of job opportunities.</li> <li>• Maintaining and improving the natural heritage and historic environment.</li> <li>• Promoting access to a range of services and facilities.</li> </ul>	<p>Air, water, soil and geology, climatic factors, biodiversity, landscape, health, population, cultural heritage and material assets.</p> <p>The Strategy outlines the ways in which inter-isles transport can support implementation of the Structure Plan.</p>

\* Climatic effects; Local air quality; biodiversity; water; soil; geology; landscape; cultural heritage (including architectural and archaeological heritage); population; human health; material assets; noise; inter-relationship between these issues; secondary and cumulative effects.

**TABLE 5.3 REVIEW OF LOCAL POLICY**

<b>Name of PPS/ environmental protection objective</b>	<b>Title of legislation and main requirements of PPS / Environmental protection objective</b>	<b>How it affects, or is affected by, The Strategy in terms of SEA issues* at Schedule 3 of the Environmental Assessment (Scotland) Act 2005</b>
The Orkney Local Plan	<p>Town and Country Planning (Scotland) Act 1997                      Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997</p> <p>The Orkney Local Plan sets out a detailed framework for the development of land in the County over the next 5(10) years and aims to:</p> <ul style="list-style-type: none"> <li>• apply national and regional planning policies at local level;</li> <li>• stimulate and encourage appropriate development;</li> <li>• protect the environment from inappropriate development;</li> <li>• provide a detailed basis for the determination of planning applications; and</li> <li>• show how those who are interested in the area are affected by or can contribute to the implementation of the Plan.</li> </ul> <p>The Local Plan together with the Orkney Structure Plan, form the Orkney Development Plan.</p>	<p>Air, water, soil and geology, climatic factors, biodiversity, landscape, health, population, cultural heritage and material assets.</p> <p>Key transport objectives of the Development Plan which are promoted by the Strategy are:</p> <ul style="list-style-type: none"> <li>• to support development of integrated transport system;</li> <li>• to encourage maintenance and enhancement of vital air, sea and other public transport services;</li> <li>• to encourage appropriate traffic management in a manner which is sensitive to the natural heritage and historic environment;</li> </ul>
OIC Biodiversity Action Plan	<p>Nature Conservation (Scotland) Act 2004                      The Wildlife &amp; Countryside Act 1981 (as amended)                      The Conservation (Natural Habitats &amp; c.) Regulations 1994</p> <p>The objectives of the Plan are to maintain and, where practicable, to enhance:</p> <ul style="list-style-type: none"> <li>• the overall population and natural ranges of native species and the quality and range of wildlife habitats and ecosystems;</li> <li>• internationally and nationally important and threatened species, habitats and ecosystems;</li> <li>• species, habitats and managed ecosystems that are characteristic of Orkney or are perceived to be of local importance;</li> <li>• the biodiversity of natural and semi-natural habitats where this has diminished over recent decades; and also:</li> <li>• to increase public awareness of, and involvement in, conserving biodiversity; and</li> <li>• to identify priorities for habitat and species conservation in Orkney and set realistic targets and timescales for these.</li> </ul>	<p>Biodiversity, climatic factors, water, soil and geology.</p> <p>The overall key objective of the BAP is to ensure that other plans, programmes and policies incorporate appropriate biodiversity targets and are committed to their implementation.</p> <p>The Orkney Islands Inter-Isles Connectivity Strategy will incorporate and implement appropriate biodiversity targets.</p>

\* Climatic effects; Local air quality; biodiversity; water; soil; geology; landscape; cultural heritage (including architectural and archaeological heritage); population; human health; material assets; noise; inter-relationship between these issues; secondary and cumulative effects.

**TABLE 5.3 REVIEW OF LOCAL POLICY**

Name of PPS/ environmental protection objective	Title of legislation and main requirements of PPS / Environmental protection objective	How it affects, or is affected by, The Strategy in terms of SEA issues* at Schedule 3 of the Environmental Assessment (Scotland) Act 2005
Orkney Outdoor Access Strategy	<p>Land Reform (Scotland) Act 2003</p> <p>This strategy will help ensure that the Council is able to fulfill its duties under the legislation.</p> <p>Key issues in the strategy include:</p> <ul style="list-style-type: none"> <li>• a need to develop off road cycle routes in the countryside;</li> <li>• a need to stimulate public interest in walking and cycling as a means to improve their health;</li> <li>• the need to provide access opportunities which encourage people to walk and cycle;</li> <li>• a need to develop further safe cycle routes in towns and villages.</li> </ul>	<p>Human health and local air quality.</p> <p>As part of the Orkney Outdoor Access Strategy a range of walks and paths have been identified in the North and South Isles.</p> <p>The Strategy features the strategic planning objective:</p> <ul style="list-style-type: none"> <li>• Facilitate more tourist travel to the Isles.</li> </ul>
Orkney Environmental Strategy and Action Plan	<p>Nature Conservation (Scotland) Act 2004</p> <p>The Wildlife &amp; Countryside Act 1981 (as amended)</p> <p>The Conservation (Natural Habitats &amp; c.) Regulations 1994</p> <p>The Water Environment &amp; Water Services (Scotland) Act 2003</p> <p>The Environmental Protection Act 1990</p> <p>The Air Quality Limit Values (Scotland) Regulations 2003</p> <p>Energy Act 2004</p> <p>The Orkney Environmental Partnership is one of the sub-strategies of the Community Plan and was established:</p> <ul style="list-style-type: none"> <li>• in response to the Government’s Local Agenda 21 and Community Planning Initiatives;</li> <li>• to assist in the development of the Local Biodiversity Action Planning process; and</li> <li>• in recognition that whilst many of the partner organisations are undertaking individual initiatives and projects for the benefit of Orkney’s environment, there was a lack of a strategic overview which would allow resources to be targeted in a more co-ordinated and integrated manner.</li> </ul>	<p>The overall vision for Orkney is that of a high quality environment which contributes to the continued economic and social wellbeing of the County and where the principles of sustainable development have been adopted by all agencies and sectors of the economy.</p> <p>This vision includes:</p> <ul style="list-style-type: none"> <li>• a more sustainable and integrated transport network which contributes to a better environment; and</li> <li>• the limiting of pollution to levels which natural systems can cope with without damage.</li> </ul> <p>These are objectives which feature strongly in the Orkney Islands Inter-isles Connectivity Strategy.</p>
Orkney Tourism Partnership Plan and Action Plan	<p>This action plan outlines the priorities and specific actions that the tourism industry and agency partners will deliver over the period 2006 to 2009.</p>	<p>Climatic factors, Biodiversity, Water, Population</p> <p>The Strategy features the strategic planning objective:</p> <ul style="list-style-type: none"> <li>• Facilitate more tourist travel to the Isles.</li> </ul>

\* Climatic effects; Local air quality; biodiversity; water; soil; geology; landscape; cultural heritage (including architectural and archaeological heritage); population; human health; material assets; noise; inter-relationship between these issues; secondary and cumulative effects.

**TABLE 5.3 REVIEW OF LOCAL POLICY**

<b>Name of PPS/ environmental protection objective</b>	<b>Title of legislation and main requirements of PPS / Environmental protection objective</b>	<b>How it affects, or is affected by, The Strategy in terms of SEA issues* at Schedule 3 of the Environmental Assessment (Scotland) Act 2005</b>
Orkney & Shetland Area Waste Plan	The Environmental Protection Act 1990 The Plan sets out waste policy for Orkney and Shetland	<p>Water, soil, geology and local air quality.</p> <p>Recycling facilities for cans, glass and paper would be provided for passengers in the new replacement ferry vessels.</p> <p>Remaining waste which is unsuitable for recycling would continue to be collected by Harbours Department staff for disposal as set out in Orkney Ferries' Waste Management Plan.</p> <p>Waste from the North and South Isles is transported by Orkney Ferries to the Orkney Mainland.</p>

\* Climatic effects; Local air quality; biodiversity; water; soil; geology; landscape; cultural heritage (including architectural and archaeological heritage); population; human health; material assets; noise; inter-relationship between these issues; secondary and cumulative effects.

# STRATEGIC ENVIRONMENTAL ASSESSMENT OF THE ORKNEY ISLANDS INTER-ISLES CONNECTIVITY STRATEGY

## Appendix B – Environmental Baseline Report

In order to enable the current state of the environment to be assessed, a range of baseline data has been collected. This allows any existing problems to be identified and provides the benchmark against which the forecast and monitored levels of environmental effects will be evaluated. The following features of the environment are examined:

1. Climatic effects
2. Local air quality
3. Water
4. Soils
5. Geology
6. Biodiversity
7. Landscape
8. Cultural heritage
9. Health
10. Population
11. Material assets
12. Noise

This report provides a baseline under each of these features, together with the relevant Strategic Environmental Assessment objectives which have been identified as criteria against which to assess the possible environmental effects of the Orkney Islands Inter-isles Connectivity Strategy.

### Baseline Overview

Number of islands:	70+
Number of inhabited islands:	17
Total (land) area of the Orkney Islands:	989.9 km <sup>2</sup> <sup>1</sup>
Total length of coastline:	over 980 km
Dimensions:	Approximately 85 km north to south and 37 km east to west
Outlying Island with highest population:	Westray
Smallest inhabited island:	Papa Stronsay
Longitude: (Kirkwall)	3° W
Latitude: (Kirkwall)	59°N
Population (2006):	19,779
Least distance from Scottish mainland:	10.5

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<sup>1</sup> General Register Office for Scotland Population Estimates



# 1. Climatic effects

## SEA Objective:

- To minimise output from transport of CO<sub>2</sub> emissions

It is widely accepted that increasing levels of certain gases in the atmosphere are causing significant changes to global climates through their “greenhouse effect,” whereby they reduce the rate of radiative heat loss from the atmosphere, causing temperatures around the world to rise. Recorded weather data confirms that temperatures have indeed increased in the UK over recent decades but not at the same rate in all regions. Information on climate trends published by the Scotland and Northern Ireland Forum for Environmental Research (SNIFFER)<sup>2</sup> shows that, between 1961 and 2004, the average annual temperature in the north of Scotland increased by 0.92 °C.

The United Nations Convention on Climate Change was established in 1992 as an international framework to agree strategies to reduce emissions of greenhouse gases. The Kyoto Protocol agreement subsequently established a timetable for reduction in emissions as well as a framework for the sequestration of carbon by vegetation. In 1997, under the Kyoto Agreement, the UK Government agreed to reduce emissions in the UK of the ‘basket of six greenhouse gases’ (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride) by 12.5% in the period to 2008-2012 in comparison with a 1990 baseline. By 2004 emissions of these gases had decreased by 15.1 per cent relative to 1990 and the UK looks set to exceed the target.

However, over the next 100 years carbon dioxide is forecast to make the largest contribution to global warming<sup>3</sup> and the UK Government has a further, more ambitious, domestic goal to cut CO<sub>2</sub> emissions by 20 per cent below 1990 levels by 2010. Statistics to 2004 show that achievement of this target is less likely. The Department for Environment, Food and Rural Affairs (Defra) publishes annual statistics on emissions of total greenhouse gases and also carbon dioxide. **Table 1.1** below shows changes in emissions of greenhouse gases and carbon dioxide in the United Kingdom during the period 1990 – 2004.

**Table 1.1 Emissions of greenhouse gases in the UK: 1990 - 2004<sup>4</sup>**

Million tonnes (carbon)								
	1990	1995	2000	2001	2002	2003	2004	% change (1990 – 2004)
Basket of greenhouse gases	211	194	183	185	179	180	181	-14.2
Carbon dioxide	161	150	149	153	149	152	152	-5.6

**Table 1.2** below illustrates levels of carbon dioxide emissions by end user during the period 1970 – 2004 in the United Kingdom. In 2004 transport was responsible for 28 per cent of carbon dioxide emissions in the UK.

**Table 1.2 Carbon dioxide emissions in the UK by source: 1970 - 2004<sup>5</sup>**

Million tonnes (carbon equivalent)									
	1970	1980	1990	2000	2001	2002	2003	2004	2004
INDUSTRY	83	60	52	43	44	41	42	43	43
DOMESTIC	54	48	42	40	42	41	42	42	42
TRANSPORT	21	28	38	41	41	42	43	43	43
OTHER	29	29	29	25	26	25	25	25	25
<b>TOTAL</b>	<b>187</b>	<b>166</b>	<b>161</b>	<b>149</b>	<b>153</b>	<b>149</b>	<b>152</b>	<b>152</b>	<b>152</b>

Detailed information on the level of CO<sub>2</sub> emissions at local authority level is not available for the Orkney Islands. However the Scottish Executive publication *Key Scottish Environmental Statistics 2006* shows that in 2003, Scotland’s net emissions were 12.07 million tonnes of carbon equivalent (around 8% of the UK total), a decline of 1.7 million tonnes from 1990 levels.

<sup>2</sup> SNIFFER, ‘A handbook of climate trends across Scotland’, 2006 [www.sniffer.org.uk](http://www.sniffer.org.uk)

<sup>3</sup> Climate Change The UK Programme 2006

<sup>4</sup> Defra e-Digest Environment Statistics, Global Atmosphere  
<http://www.defra.gov.uk/environment/statistics/globalatmos/kf/gagccukem.htm>

<sup>5</sup> Defra e-Digest Environmental Statistics, Global Atmosphere  
<http://www.defra.gov.uk/environment/statistics/globalatmos/kf/gakf07.htm>

Table 1.3 below shows the contribution of the transport sector to total emissions in Scotland

**Table 1.3 Net emissions by source in Scotland taking account of emissions and removals (million tonnes of carbon equivalent)<sup>6</sup>**

Sector	1990	1995	2000	2001	2002	2003
<b>Million tonnes of carbon equivalent</b>						
Energy supply	5.86	6.68	6.70	6.57	6.34	6.32
Agriculture, business, industrial processes and waste management	3.60	2.60	2.42	2.51	2.05	2.03
Public and residential	2.37	2.29	2.28	2.42	2.23	2.18
Transport	2.77	2.73	2.80	2.76	2.81	2.87
Net land use change & forestry	-0.83	-1.19	-1.26	-1.27	-1.32	-1.34
Total net emissions	13.77	13.11	12.95	12.99	12.11	12.07
% of transport contribution	20.1	20.8	21.6	21.2	23.2	23.8

'R' indicates that figures have been revised since previous publications.

Road and air traffic levels are forecast to increase across Scotland and the rest of the UK and as Table 1.4 below shows, these are the modes of transport which produce higher levels of CO<sub>2</sub> emissions.

**Table 1.4: Comparison of grams of CO<sub>2</sub> produced per passenger km travelled in different transport modes<sup>7</sup>**

Transport mode	grams CO <sub>2</sub> /pkm
Petrol car (fleet weighted average)	110
Diesel car (fleet weighted average)	106
All cars (fleet weighted average)	109
Bus	76
Moped	75
Motorcycle	94
Rail passenger (average UK – electric and diesel)	40
Air (short haul)	150
Air (long haul)	110

Table 1.4 does not include values for typical quantities of CO<sub>2</sub> produced by ferry transport but in Table 1.5 the level of CO<sub>2</sub> emissions produced by each inter-island ferry vessel is calculated from its fuel consumption during 2004.<sup>8</sup>

**Table 1.5: Fuel consumption and CO<sub>2</sub> emissions of Orkney Ferries vessels (2004)**

Ferry	Fuel consumption during 2004 (litres)	Conversion factor	Emissions of CO <sub>2</sub> (tonnes)
MV Earl Sigurd	739,995	2.68	1983.2
MV Earl Thorfinn	695,400	2.68	1863.7
MV Eynhallow	148,700	2.68	398.5
MV Graemsay	69,680	2.68	186.7
MV Hoy Head	235,736	2.68	631.8
MV Shapinsay	130,000	2.68	348.4
MV Thorsvoe	72,380	2.68	194.0
MV Varagen	576,958	2.68	1546.2
<b>Total diesel</b>	<b>2,668,849</b>	2.68	<b>7,152.5</b>
Shore power (electricity)	263,912 units @ £0.08	0.43	113.5
<b>TOTAL</b>			<b>7,266</b>

<sup>6</sup> Scottish Executive, Key Scottish Environmental Statistics, 2006  
<http://www.scotland.gov.uk/Publications/2006/08/15095714/10>

<sup>7</sup> Energy Savings Trust website. <http://www.est.custhelp.com>

<sup>8</sup> Orkney Islands Council, Carbon Management Programme, 2006

Air travel is also important to the population of the Orkney Islands - for business, education and leisure use; to allow patient travel to and from hospital in Kirkwall, Aberdeen or further afield; and as a means of access for tourists visiting Orkney, which represents a vital part of the economy. The inter-isles air service complements the inter-isles ferry service, allowing short journey times to and from the islands. Operated by Loganair, the service is subsidised by Orkney Islands Council and run as a Public Service Obligation.

The Inter-Isles air service presently provides:

- Two - three flights to Papa Westray on five days per week; two flights on Saturday and one on Sunday, all year;
- Two flights daily to Westray on six days per week and one on Sunday, all year;
- Two flights daily to Sanday and Stronsay on six days per week, all year;
- Two flights to Eday on Wednesday, all year.
- Two – three flights to North Ronaldsay on five days per week and two on both Saturday and Sunday throughout winter; Three – four flights on five days per week, two on Saturday and three on Sunday during the summer.

Approximately 346 tonnes of carbon dioxide were produced by inter-islands air service operations during 2004.

In a study carried out during 2003 into the environmental impact of aviation in the Highlands and Islands Region<sup>9</sup>, data on the fuel consumed and the passenger loadings were used to calculate the total CO<sub>2</sub> emissions for each route operated in the region. **Table 1.6** highlights results from this study which relate to flights operating to and within the Orkney Islands, and includes, for comparison, CO<sub>2</sub> emission values for two services operating between Inverness and Gatwick.

**Table 1.6: Climate-change inducing emissions in aviation serving the Orkney Islands (2003)**

Route	Emissions per passenger per journey (kg CO <sub>2</sub> )	Climate impact (including RFI) per passenger (kg CO <sub>2</sub> )*	Number of single flights per year
Loganair			
Glasgow Inverness Kirkwall Sumburgh	149	149	724
Kirkwall Inverness Edinburgh	116	116	724
Edinburgh Wick Kirkwall	124	124	620
Aberdeen Kirkwall	47	47	1,938
Orkney inter-island	33	33	1,665
BA CitiExpress			
Inverness Gatwick	145	377*	148
EasyJet			
Inverness Gatwick	83	216*	148

\* RFI (Radiative Forcing Index) of 2.6 is applied to routes where aircraft travel at higher altitudes. All other routes have RFI of 1.0 to reflect the lower altitudes of these flights.

Factors which determine the level of emissions per passenger per journey include aircraft size, the altitude at which aircraft operate, the number of take-off and landing phases and the level of passenger loading.

Air travel within the Orkney Islands has a much lower polluting impact compared to that in the UK as a whole or globally, mainly due to the use of smaller aircraft travelling at lower altitudes.

The Orkney Islands Inter-isles Connectivity Strategy is unlikely to contribute significantly towards reducing the overall growth in transport-related emissions in Scotland and the UK; however ferry vessels built today would be designed to current standards and would feature more efficient engines. Furthermore, training programmes geared towards energy-efficient operation of vessels could be provided for ferry crews.

<sup>9</sup> The Environmental Impact of Aviation in the Highlands and Islands, Highlands and Islands Enterprise, 2003

## 2. Local air quality

### SEA Objective:

- To maintain a good standard of air quality

Part IV of the Environment Act 1995 introduced the requirement for development of a national strategy to improve air quality and reduce risks to human health from air-borne pollutants. The resulting *Air Quality Strategy for England, Scotland, Wales and Northern Ireland*, published in January 2000 identified clear and measurable targets to improve air quality in line with European Council directives, World Health Organisation guidance and the UK's Expert Panel on Air Quality Standards. In February 2003 the *Air Quality Strategy for England, Scotland, Wales and Northern Ireland: Addendum* was published.

All local authorities are required to review and assess air quality within their area to see if any of the National Air Quality Strategy (NAQS) objectives are unlikely to be met.

Within Orkney air quality is generally very good as there are few significant industrial processes on the islands and road traffic volumes are low. With the exception of small areas of urban development, and the oil industry activity on Flotta and in Scapa Flow, the County is mainly rural in character. Furthermore, aircraft volumes and passenger numbers at Kirkwall airport are currently less than 2% of the suggested action threshold of 5 million passengers per year.

Levels of three air pollutants are monitored in Orkney: benzene, nitrogen dioxide and sulphur dioxide. All three are produced in transport emissions but in the Orkney Islands the major source of benzene is recognised to be the Flotta oil terminal and the predominant source of SO<sub>2</sub> is from the combustion of sulphur-containing fossil fuels, principally coal and heavy oils for heating. Benzene is monitored at three locations (Waulkmill, St Mary's and Herston) with sulphur dioxide and nitrogen dioxide monitored at six locations (the previous three plus Stromness, Kirkwall and Stronsay). Monitoring is carried out in all areas using passive diffusion tubes.

The air quality objective for NO<sub>2</sub> is:

- 200 µg/m<sup>3</sup> (105ppb), as a 1-hour mean, not to be exceeded more than 18 times a year, to be achieved by 31 December 2005.
- 40 µg/m<sup>3</sup> (21 ppb), as an annual mean, to be achieved by 31 December 2005.

Monitoring results collected so far indicate that the sites at Kirkwall and Stromness experience the highest levels of NO<sub>2</sub>.

Maximum values during 2004-2005 were 21 µg/m<sup>3</sup> in Kirkwall and 15 µg/m<sup>3</sup> in Stromness, both recorded during October 2004.

In 2005-2006 maximum values were 38 µg/m<sup>3</sup> at Kirkwall and 13 µg/m<sup>3</sup> at Stromness, both recorded during July 2005.

It has not been possible to calculate annual means for either year due to incomplete data sets, but the highest measured six-month mean for Kirkwall is 16.2 µg/m<sup>3</sup> and at the four rural sites NO<sub>2</sub> levels were below the detection limits of the instrument and were therefore recorded as being less than 0.2 µg/m<sup>3</sup>. Orkney Islands Council subsequently produced a Local Air Quality Assessment and Screening Report stating that *'the likelihood of the Air Quality Objective for nitrogen dioxide being exceeded in Orkney is negligible.'*

The air quality objectives for SO<sub>2</sub> are:

- 266 µg/m<sup>3</sup> (100ppb), not to be exceeded more than 35 times a year, measured as a 15-minute mean, to be achieved by December 2005.
- 350 µg/m<sup>3</sup> (132 ppb), not to be exceeded more than 24 times a year, measured as a 1-hour mean, to be achieved by 31 December 2004.
- 125 µg/m<sup>3</sup> (47 ppb), not to be exceeded more than 3 times a year, measured as a 24-hour mean, to be achieved by 31 December 2004.

Results of SO<sub>2</sub> monitoring carried out during the period between 2004 and 2006 indicated that levels in the county were very low, with the majority of readings being below the detection limits of the instrument (0.2 ppb or 0.5 µg/m<sup>3</sup>). Diffusion tubes are not recommended for monitoring SO<sub>2</sub> on the grounds that they measure concentrations over a long averaging period, and the results cannot easily be compared with the shorter-term objectives. Therefore, to ensure compliance with the short-term limits (15 minutes, 1 hour, 24 hour), a study was

carried out by SEPA Field Chemistry to measure SO<sub>2</sub> in ambient air at a further two sites: close to the SEPA authorised animal incinerator at Chinglebraes and within the Clay Loan area in Kirkwall (an area where approximately 150 houses have solid-fuel fires). Over two separate periods between October 2004 and April 2005, SO<sub>2</sub> levels were measured, averaged and stored as 15-minute averages. The results of this monitoring programme confirmed the very low readings taken from the diffusion tubes and it was concluded that SO<sub>2</sub> levels within Orkney are not likely to exceed the air quality objectives presented within the Air Quality Strategy, 2003.

Levels of SO<sub>2</sub> recorded at all of the six monitoring locations during 2005/2006 were well below the air quality objective levels with all, apart from three, monthly measurements being below the limits of detection. Of the three readings above the LOD the highest was 3.99 µg/m<sup>3</sup> and was recorded in Stronsay. The annual mean was not calculated for this pollutant as readings were so low that most would have to be omitted from the calculation.

The air quality objective for benzene in Scotland is:

- 3.25 µg/m<sup>3</sup> (5ppb) measured as a running annual mean, to be achieved by 31 December 2010.

During 2004-2005 the highest level of benzene recorded was 1.6 ppb and over the following year there were no significant changes in levels recorded. All levels recorded over a six month period were below the level of detection of the measuring instrument (0.1 µg/m<sup>3</sup>).

It is therefore concluded that benzene levels within Orkney are not likely to exceed the air quality objective.

The air quality objective for Particulate Matter (PM<sub>10</sub>) is:

- 50 µg/m<sup>3</sup> when expressed as a 24hr hourly mean: not to be exceeded more than 7 times a year by 31 December 2010.

Due to the low levels of other pollutants from exhaust emissions it is not deemed necessary to monitor Particulate Matter in the Orkney Islands.

The Progress Report shows that Orkney is currently meeting the air quality objectives and is not at risk of exceeding the objectives.

### 3. Water

#### SEA Objective:

- To protect and maintain the quality of water bodies, wetlands and floodplains

#### Water

Water quality in Scotland is monitored by the Scottish Environment Protection Agency (SEPA) and the subsequent system of classification is based on both chemistry and biology results. An explanation of SEPA's rivers classification scheme can be found at [http://www.sepa.org.uk/data/classification/river\\_classification.htm](http://www.sepa.org.uk/data/classification/river_classification.htm).

The total network length which is classified in Orkney has increased from 23.8 km in 2000 to 71.9 km in 2005 but accurate classification has only been possible during the last two years with improvement of the biological classification tool, RIVPACS. The islands' rivers were not classified until 2004. A Highlands and Islands RIVPACS module was used in 2005 and this gave more accurate results for Orkney. It resulted in a decrease in class A1, B and C watercourses and an increase in A2 watercourses.

It is important to note that the overall network length increased from 57.6 km in 2004 to 71.9 km in 2005 and new rivers would have been classified for the first time. This factor could partly account for the increased number of A2 watercourses in 2005. There was a negligible change in the percentage of class D watercourses which currently account for 1-3% of all Orkney's rivers.

A summary of the freshwater classification results for Orkney is provided in **Table 3.1** below.

**Table 3.1: Classification of freshwater watercourses in the Orkney Islands 2000-2005**

	Water sampled (km)	Classification (% of water sampled (km))				
		A1	A2	B	C	D
<b>2000</b>	23.8	21	46	19	2	12
<b>2001</b>	23.7	21	46	19	2	12
<b>2002</b>	25.7	19	50	18	2	11
<b>2003</b>	24.4	48	50	0	2	0

		Classification (% of water sampled (km))				
2004	57.6	28	45	16	8	3
2005	71.9	19	66	12	1	2

Groundwater quality data has been collected by SEPA from three monitoring points in Orkney and these are listed below in **Table 3.2**.

**Table 3.2: Groundwater monitoring points in the Orkney Islands**

Location	OS National Grid Reference
Shapinsay	HY 50813 17370
Little Mill House	HY 48843 02539
Lintybrae	HY 40216 07024

SEPA ceased monitoring at Lintybrae after 2003 but continues to monitor groundwater at the Shapinsay and Little Mill House locations.

Coastal water from eighteen locations around the Orkney Islands has been classified and a summary of the results from samples taken during 2005 is presented in **Table 3.3**.

**Table 3.3: Orkney coastal water classification 2005**

Classification of coastal water					
Total class A		Total class B		Total class C	
Sites	Length (km)	Sites	Length (km)	Sites	Length (km)
1	0.1	16	7.2	1	2

**Table 3.4** lists the coastal water classifications for receiving waters which are relevant to the Orkney Islands Inter-isles Connectivity Strategy.

**Table 3.4 Coastal water classifications for receiving waters relevant to the Strategy**

RECEIVING WATER	SITE	CLASS	LENGTH
Bay of Ireland	Stromness main	B	1
Bay of Kirkwall	Kirkwall Bay	B	0.5
Bay of Pierowall	Gill Pier	B	0.1
Bay of Pierowall	Westray No.2	B	0.1
The String	Shapinsay main	B	0.1
Ore Bay	Lyness Pier	B	0.2
Papa Sound	Whitehall	B	0.5
Scapa Flow	Flotta	B	2
Wyre Sound	Rousay Pier houses	A	0.1
Stromness Harbour	Stromness harbour	C	2

### Flooding

Orkney's average annual rainfall ranges from 861 mm to 1250 mm with the west of the county generally experiencing rather higher rainfall than the east.<sup>10</sup> Records dating from 1961 indicate that, similar to other regions of Scotland, the winter months in Orkney have become wetter and the summer months a little drier.

In the past, flooding in the Orkney Islands has involved inundation by the sea, generally due to storm surges combined with high spring tides. However, changes to our climate, for example increases in temperature and rainfall, mean that the incidence of flooding may in future become more frequent. Heavy and persistent rain

<sup>10</sup> SNIFFER, 'A handbook of climate trends across Scotland', 2006 www.sniffer.org.uk

during October 2006 caused widespread disruption on the road network when many areas of Orkney were affected by flooding.

SEPA's Indicative River and Coastal Flood Map (Scotland)<sup>11</sup> indicates areas which are at risk of flooding and will enable effective planning of any changes to the transport system.

#### Fishing and Aquaculture

The shellfish industry provides an important source of income in the Isles and a range of species are fished from their extensive coastlines and bays. Lobster, brown crab, velvet crab and whelks are caught in baited creels; scallops and queen scallops may be caught by divers or in dredges operated from boats; razor shells (known locally as spoots) may be caught offshore by divers, or more often by hand from sandy intertidal areas during extreme low tides, as are cockles, and winkles are gathered from rocky intertidal areas. Unfortunately, however, due to commercial interests, little information is available on individual fishing locations. **Table 3.5** presents landings of shellfish by Orkney vessels between 2001 and 2006. Although landings of shellfish have varied from year to year their value has shown a marked increase over the period.

**Table 3.5: Landings of shellfish by Orkney vessels<sup>12</sup>**

	LIVE WEIGHT TONNES	£ THOUSANDS
2001	3,378	4,933
2002	3,106	4,649
2003	3,283	5,144
2004	3,594	5,506
2005	3,917	6,072
2006	3,799	6,809

The seas around the isles are also popular with sea anglers fishing from small boats and with trout fishermen fishing from the shore.

Aquaculture is an important contributor to the economy of the islands and there are currently 30 licensed fish farm sites in Orkney waters. However, these are not all in production at any one time as each site must regularly undergo a fallowing period and some sites have never been stocked. Fish farms are located in the vicinity of the ferry routes which link Rousay and Egilsay, Westray and Papa Westray, Eday and Sanday, and further farms are located in Veantrow Bay, Shapinsay, and in bays along the eastern shore of Hoy. Salmon account for most of the fish produced, but certain farms are also diversifying by producing Sea Trout, Rainbow Trout and Halibut. Mussel culture is also being trialled at two sites in Scapa Flow, one of which is located off Clestrain in the Bay of Ireland and the other off the Orphir shore, close to Toy Ness.

## 4. Soils

### **SEA Objective:**

- To safeguard soil quality and quantity

Certain options within the Orkney Islands Inter-isles Connectivity Strategy could include the construction of access roads to piers. The initial planning process prior to any road construction would include obtaining baseline information on soil types within the area identified for development. General information on the soil

<sup>11</sup> Indicative River and Coastal Flood Map (Scotland), SEPA, 2005. [www.sepa.org.uk/flooding/mapping/](http://www.sepa.org.uk/flooding/mapping/)

<sup>12</sup> Orkney Economic Review 2007

types of Orkney is available from Scottish Natural Heritage Review No 100, Orkney Character Assessment.<sup>13</sup> The soil types of Stronsay, Hoy and Sanday, where development involving land-take may occur, are summarised below:

The soils of **Stronsay** are generally non calcareous gleys and brown forest soils, which are mainly cultivated under ley or permanent pastures and arable. The extensive sand deposits of **Sanday** determine that most of the island's soils are light and friable and generally of the following types: calcareous gleys and regosols, brown forest soils and rankers. **Hoy** contains the most extensive area of blanket bog in Orkney. The peat covers much of the high ground between Rackwick and Melsetter. Elsewhere the soils are based mainly on coarse or moderately coarse tills; gleys are common on the flatter land.

Data is currently not available on the quality of soils in Scotland as no monitoring is carried out on their composition. However, Scotland's Climate Change Programme<sup>14</sup> includes plans to establish a soil monitoring system, especially with regard to carbon content, and to develop a soil strategy. To fulfill aspects of the monitoring commitment of the Orkney Islands Local Transport Strategy, which has recently been published, we would anticipate using the resulting data to monitor impacts from transport on soils, in particular those of roadside verges.

#### Agricultural Land

Much of the land of the Orkney Islands is fertile agricultural land and in recent years farming methods have been predominantly intensive. However, the progression from the production-led agricultural subsidy system to the present Single Farm Payment with Modulation may bring changes to stocking densities and farming methods. Modulation is intended to fund improvements to the environment, and increasing uptake of agri-environment schemes such as the Rural Stewardship scheme and SNH's Natural Care scheme may further change the farming landscape of Orkney. Figures for agricultural land use in Orkney, released annually by The Scottish Executive Environment and Rural Affairs Department (SEERAD) show little change between 2001 and 2006. Grassland and rough grazing continue to dominate agricultural land usage in Orkney reaching a figure of over 92% of total land use in 2006. These figures are illustrated in **Table 4.1** below.<sup>15</sup>

**Table 4.1 Agricultural Land Use in Orkney during the period 2001 until 2006**

Agricultural Land Use Practice	Total area (hectares)					
	2001	2002	2003	2004	2005	2006
Cereals	4,036	4,036	4,030	4,121	4,061	4,069
Potatoes	58	58	55	52	55	42
Stock-feeding crops	488	391	420	418	443	523
Other crops	28	44	37	56	82	130
Set aside	306	337	321	392	229	263
Vegetables for human consumption	8	10	8	17	11	12
Bare fallow	88	138	152	121	221	231
<b>Total crops, set aside and fallow</b>	<b>5,012</b>	<b>5,014</b>	<b>5,024</b>	<b>5,177</b>	<b>5,102</b>	<b>5,270</b>
Grassland	49,513	49,966	50,021	49,889	49,266	49,287
Rough grazing	36,265	36,254	36,074	35,985	36,525	36,745
Farm woodland	78	93	101	110	126	320
Other land	1,308	1,344	1,321	1,276	1,344	1,310
<b>Total Land</b>	<b>92,176</b>	<b>92,671</b>	<b>92,540</b>	<b>92,437</b>	<b>92,363</b>	<b>92,932</b>

<sup>13</sup> Scottish Natural Heritage Review No 100, Orkney Landscape Character Assessment. Land Use Consultants, Glasgow (1998)

<sup>14</sup> Changing Our Ways, Scotland's Climate Change Programme Scottish Executive (2006)

<sup>15</sup> Scottish Agricultural Census 2001 - 2006



## Contaminated land

Under Part IIA of the Environmental Protection Act 1990 (as inserted by the Environment Act 1995) each local authority is required to “*cause its area to be inspected from time to time for the purposes of identifying contaminated land*”. The local authority therefore has the responsibility to determine whether any land is contaminated.

Contaminated land is defined as,

*“any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on, or under the land, that*

- a) significant harm is being caused or there is a significant possibility of such harm being caused; or*
- b) pollution of controlled waters is being, or is likely to be, caused”*

To ensure compliance, and to deal with contaminated land in the Orkney Islands, Orkney Islands Council Department of Environmental Health has produced a Contaminated Land Strategy. Information gathered on potential contaminated land sites includes some 37 waste management sites, over 70 Second World War military sites and a number of other sites totalling 149 sites. These sites are listed in a Contaminated Land Register which is maintained by the Environmental Health Department and is available for inspection at the Council Offices.

## **5. Geology**

### **SEA Objective:**

- To protect sites which illustrate the geological heritage of Orkney

The oldest rock exposed in Orkney is the Precambrian Basement Complex, examples of which outcrop around the town of Stromness and on the neighbouring island of Graemsay. These outcrops represent the tops of island hills which, during the Devonian period, were surrounded by a large lake which is now referred to as Lake Orcadie. At that time (416-359 million years ago) the area was located in an equatorial and mid-continental desert region and fluctuations in rainfall caused the depth and extent of the lake to vary as it periodically dried out and flooded. The Orkney Islands today are dominated by rocks which were originally deposited as sediments in Lake Orcadie. These sedimentary layers accumulated to great depths and ranged from fine-grained muds which settled in deep, still waters, to sands and coarser conglomerates which were deposited from faster flowing streams and rivers, and even to wind-blown sands which formed dunes during particularly arid periods. Over time these sediments have formed the flagstones and sandstones which characterise most of Orkney today.<sup>16</sup>

Lake Orcadie appears to have been at times very productive but evidence shows that during periods of drought large numbers of fish died, sinking out of the water column to the bed of the lake where they became preserved in the fine-grained muds. These are now found as fossils in strata known as the Sandwick and Rousay fish beds.

The area also experienced considerable volcanic activity, evidence of which is visible as intrusive dykes dating from the Younger Permian (250 million years ago). These igneous dykes are visible in the intertidal areas of many rocky shores and a particularly clear example can be found at the Point of Buckquoy in Birsay where the black basalt dyke contrasts strongly with the surrounding paler sedimentary rock.

During the Quaternary, the geology of Orkney was heavily modified by glaciation which smoothed and rounded hills and ridges on land and excavated the major firths of Hoy Sound, Eynhallow Sound and Westray Firth. Local glaciers developed at intervals on the island of Hoy where they carved out striking corries and valleys. As the last ice sheet thinned and retreated, considerable thicknesses of glacial deposits were laid down in hollows. A good example of glacial till can be seen at Denwick in Deerness.

The geological past of Orkney is most clearly visible along its coastlines where the rock has been subject to sea level change, deformation, erosion and localised deposition. A full list of sites in Orkney which are designated for their natural heritage interest is included as Appendix B1 Natural Heritage Sites. A number of these are located in the North and South Isles and are presented in Table 5.1.

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<sup>16</sup> [www.fettes.com/orkney/geology](http://www.fettes.com/orkney/geology)

**Table 5.1 Sites in the North and South isles of Orkney, designated for their geological importance<sup>17</sup>**

SITE	DESIGNATION	GEOLOGICAL INTEREST
<b>Eday</b>		
Greenan Nev Coast,	local site geological	Exposure of Eday marls of interest in the study of Palaeo environments
Newbiggin to Neven Point,	local site geological	Good section of the western limb of the Eday Syncline
South Fersness Bay,	local site geological	Good section of the western limb of the Eday Syncline
<b>Hoy &amp; Graemsay</b>		
Hoy	SSSI / GCR	geology, geomorphology, great skuas, red throated divers, > 20,000 seabirds, wet & montane heath, petrifying tufa springs, woodland, moorland birds, upland heaths
Melsetter Coast section, Hoy	local site geological	Outcrops of the Hoy Lavas
Muckle Head and Selwick	SSSI/ GCR	Geological site due to locally important raised beach deposits
North Coast of Graemsay	local site geological	Exposure of the lower section of the Stromness Flags and Crystalline basement
North Hoy Coast	local site geological	Exposures of the Hoy Volcanics and the Hoy Sandstone in their type area
<b>Sanday</b>		
Central Sanday	SSSI/ GCR	Machair and other blown sand shingle landforms unique in North Scotland. Botanical and Ornithological interest
Doun Helzie, Sanday	local site geological	Beach Dune and Machair association
Hegglie Ber, Sanday	local site geological	Coarse pebbly and conglomeratic facies of Lower Eday Sandstone
Scar, Sanday	local site geological	Glacial erratic
<b>Shapinsay</b>		
Ayre of Vasa	local site geological	Complex cusped foreland
Veantrow Bay,	local site geological	Complex of shingle depositional landforms
<b>Stronsay</b>		
Mill Bay, Stronsay	SSSI/ GCR	Geological: Classic shelly till with palaeo-geomorphological importance.

SSSI: Site of Special Scientific Interest

GCR: Geological Conservation Review site- nationally important Earth Science Site

## 6. Biodiversity

### SEA Objectives

- To protect, maintain and, where possible, enhance biodiversity

#### Designated Areas

The Orkney Islands are particularly valued for their wildlife and a range of sites are designated for conservation under European, national and local legislation. The main protected area designations are as follows:

- Natura 2000** is a European network of protected sites which represent areas of the highest value for natural habitats and species of plants and animals which are rare, endangered or vulnerable in the European Community. The term Natura 2000 comes from the 1992 EC Habitats Directive; it symbolises the conservation of precious natural resources for the year 2000 and beyond into the 21st century. Scotland's Natura 2000 sites will help to protect these important areas now and for generations to come. The Natura 2000 network includes two types of area:

<sup>17</sup> The Orkney Local Plan

- **Special Areas for Conservation (SAC)** are classified under the Habitats Directive for the protection of rare, endangered or vulnerable natural habitats and species of plants or animals (other than birds). These are the 189 habitats listed in Annex I and the 788 species listed in Annex II of the Habitats Directive. Species occurring in Orkney for which the UK has special responsibility include otter, grey seal and common seal.
- **Special Protection Areas (SPA)** are classified under the Birds Directive and are areas which support rare, vulnerable and regularly occurring migratory bird species which are listed in Annex I of the Birds Directive. SPAs are intended to safeguard the habitats of the species for which they are selected and to protect the birds from significant disturbance.
- **Ramsar Sites** are internationally important wetland sites protecting wildfowl habitat.
- **Sites of Special Scientific Interest (SSSI)** represent the best of Scotland's natural heritage and are special for their plants, animals or habitats, their rocks or landforms, or a combination of such natural features. They form a network of the best examples of natural features throughout Scotland, and support a wider network across Great Britain and the European Union. Designation of an SSSI is a legal process and sites are protected under the Nature Conservation (Scotland) Act 2004.
- **Local Nature Reserves (LNR):** places with special local natural interest, set up to protect nature and for people to enjoy and appreciate;

Designated sites in the Orkney Islands are summarised in **Table 6.1**

**Table 6.1: Numbers of designated sites and area they cover in Orkney**

Designation	Total number	Area within Orkney (ha)	% of Total Area of Orkney*
Site of Special Scientific Interest	36	23,644	23.9
Special Area of Conservation	6	12,908	13.0
Special Protection Area	13	17,530	17.7
Ramsar Site	1	1,607	1.6
Area of the Orkney Islands is 989.9 km <sup>2</sup> or 98,990 hectares			

- Source – SNH and JNCC, some designations may overlap

#### Sites of Local Nature Importance

These are sites which have been designated by Orkney Islands Council and are listed in the Local Plan. They are regarded by the local community as being worthy of protection for their ornithological, botanical or geological interest. It is the Council's policy to protect these areas from development unless the development provides facilities which benefit the community as a whole. A full list of these sites is included in Appendix B1.

The following paragraphs summarises the range of designated sites which are located in the North and South Isles of Orkney.<sup>18, 19</sup>

#### **North Ronaldsay**

North Ronaldsay contains no European or nationally designated areas but the entire coastline and some inland areas of the island are designated as Local Sites of Nature Conservation Importance. Due to its location as the first landfall to the south of the Shetland Islands and Fair Isle, North Ronaldsay receives many visiting migratory birds, particularly in autumn. Several lochs and wet or grazed grassland areas are designated as local ornithological sites and the entire coast is noted for its importance to black guillemot and wading birds. The island is also well known for its flock of North Ronaldsay sheep which graze the seaweed of the intertidal area and for much of the year are prevented from coming onto the fields by the stone dykes which run along the coastline.

<sup>18</sup> The Orkney Local Plan

<sup>19</sup> SNH website: [www.snh.gov.uk](http://www.snh.gov.uk)

## **Sanday**

Sanday SAC encompasses much of the shoreline and sea area around the island of Sanday. The primary reasons for selection of this site are the Annex I habitat, subtidal bedrock reefs, and the Annex II species, common seal. Annex II habitats which are also present are sandbanks which are slightly covered by seawater all the time and mudflats and sandflats not covered by seawater at low tide. Seals spend time hauled out on the intertidal and use the surrounding sea area for foraging and other aspects of their daily behaviour. Common seal pups are born during June and July and, unlike grey seal pups, are able to swim shortly after birth.

Much of the East Sanday Coast SSSI consists of rocky and sandy sections and is notable for the presence of sand dune and machair habitats as well as extensive intertidal flats and saltmarsh. The site is further characterised by a series of tombolos, bars, spits and shingle ridges. Designated due to its importance for these geomorphological features and the wading birds, common seals and vascular plant assemblage which the resulting habitats support, much of this area is further designated as the East Sanday Coast SPA and Ramsar site due to its importance for wading birds. The East Sanday Coast qualifies as an SPA by regularly supporting in winter, internationally important populations of the migratory species purple sandpiper and turnstone. The intertidal areas provide rich feeding grounds for these and other bird species. The SPA also includes parts of the Northwall SSSI, a large area of botanically diverse machair, and Central Sanday SSSI which is notified for its coastal geomorphology which includes areas of machair, saltmarsh and sand dune.

Other areas of Sanday are designated as Local Sites of Nature Conservation Importance for ornithological reasons.

## **Westray and Papa Westray**

Much of the western coastline of Westray is designated as an SSSI due both to the presence of large aggregations of breeding seabirds and of areas of maritime cliff and the associated plant species. The West Westray cliffs also have SPA status for their aggregations of breeding seabirds which include arctic skua, arctic tern, fulmar, guillemot, kittiwake and razorbill. Seabirds nest on ledges in the cliffs and use the adjacent sea areas for feeding, grooming, mating and loafing. The Noup Cliffs are an RSPB reserve.

The area known as North Hill in Papa Westray has SSSI status for its aggregations of breeding arctic skua and arctic tern and is also an RSPB reserve. The neighbouring Holm of Papa Westray has SSSI status for its breeding colony of black guillemot. Together, the North Hill and Holm of Papa Westray form the Papa Westray SPA. Local ornithological sites in Papa Westray include wetlands at Backskaill, Hookin, Mayback and Wellpark and the lochs of Ness, St Tredwell and Via. The dune grassland of the Links of Moclett is a local botanical site.

## **Eday and Calf of Eday**

In Eday two sites are designated as SSSIs. These are Mill Loch which is a breeding site for red-throated diver and Doomy and Whitemaw Hill which are designated as breeding sites for arctic skua and whimbrel.

The nearby Calf of Eday has SPA status due to its breeding seabird assemblage which includes fulmar, greater black-backed gull, guillemot, kittiwake and a nationally important cormorant colony.

The islands of Muckle and Little Green Holm which lie to the South-west of Eday have SSSI status due to the presence on these islands of grey seal.

## **Stronsay and Papa Stronsay**

On Stronsay, a number of areas are designated as Local Sites of Nature Conservation Importance for ornithological reasons. Most of these are lochs and ponds and the surrounding land areas and they are located at: Bleaching Knowe, Blan Loch, Bruce's Loch, Burial Ground, Cro Taing, Grice Ness, Kent's Pond, Lea Shun, Little Water, Loch of Matpow, Loch of Rothiesholm and Mickle Water. Further local ornithological sites are Burgh Head, Rothiesholm and South-east Stronsay. The shingle ayre and freshwater lagoon at Straenia Water is the location for a local botanical site. On Papa Stronsay a eutrophic loch and the associated wetland is designated as Local Sites of Nature Conservation Importance.

## **Faray and Holm of Faray**

These islands are located between Eday and the south-east end of Westray and together are designated as an SSSI. The Holm of Faray and the surrounding sea area are also designated as an SAC. The Annex II species, grey seal is the primary reason for selection of this site as the islands support the second largest breeding

colony in the UK, contributing around 9% of annual UK pup production. Grey seal pups are born during the period September until December.

### **Rousay**

The western and northern cliffs of Rousay together form the Rousay SPA, qualifying due to the presence during the breeding season of the Article 4.1 species arctic tern and also aggregations of up to 30,000 Article 4.2 seabirds which include arctic skua, fulmar, guillemot and kittiwake. The Loch of Wasbister is a local ornithological site and an area of broad-leaved plantation at Trumland is a local botanical site. An RSPB reserve is also located at Trumland.

### **Egilsay**

In Egilsay there are local ornithological sites at Loch of the Graand, Warsett, Lochs of Watten and Welland, Manse Loch and Whitelett and Maeness is a local botanical site. The farm of Onziebust is an RSPB reserve.

### **Wyre**

The Taing in Wyre is a local botanical site.

### **Shapinsay**

Mill Dam in Shapinsay is run as an RSBP reserve and Swart Helligo and East Hill is the location of a Scottish Wildlife Trust reserve. Further local ornithological sites are located at Laird Water and the Ouse, The Galt and Vasa Loch.

### **Hoy**

A large area of the island of Hoy is designated as a SSSI, SPA and an SAC. The area is an important SPA supporting aggregations of breeding birds which include arctic skua, fulmar, great skua, greater black-backed gull, guillemot, puffin, peregrine and red-throated diver. The island's SAC status is due to its areas of acid peat-stained lakes and ponds, alpine and sub-alpine heaths, blanket bog, calcium-rich spring-water fed fens, dry heaths, hard-water springs depositing lime, plants in crevices in base-rich rocks, vegetated sea cliffs and wet heathland with cross-leaved heath. Part of the designated area is an RSPB reserve. A number of further sites are designated as local ornithological or botanical sites and the Hill of White Hamers is a Scottish Wildlife Trust reserve.

### **Graemsay**

The area known as Hap in Graemsay is a local botanical site due to its dune and machair habitat.

### **Flotta**

The West Hill and Golta are areas of heather moorland which together form a local ornithological site and the Calf of Flotta is a local botanical site due to its woodland under-storey vegetation.

The locations of areas in the Orkney Islands which are designated as SSSI, SPA, SAC or Ramsar site are shown in **Figure 1**, Map of Orkney overleaf.

A full list of all Orkney's designated sites including a brief summary of the reasons for their notification is included in **Appendix B.1**.

### European Protected Species (EPS)

Certain species are listed on Annex IV of the Habitats Directive as species of European Community interest and in need of strict protection. The protective measures required are outlined in **Article 12** of the Directive. The species listed on Annex IV whose natural range includes any area in Great Britain are also listed on Schedules 2 (animals) and 4 (plants) of the [Habitats Regulations](#) and are specifically protected under Regulations 38-46 and Regulations 10-13 of the Amendment Regulations.<sup>20</sup>

All European Protected Species are also fully protected under the Wildlife and Countryside Act 1981, but the Regulations provide a greater level of protection, primarily through licensing procedures. For any European Protected Species of animal, the legislation makes it an offence to deliberately or recklessly capture, kill, injure

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<sup>20</sup> SNH website: [www.snh.gov.uk](http://www.snh.gov.uk)

or disturb any such animal. It is also an offence to damage or destroy their 'breeding sites' or 'resting places' (this does not have to be deliberate, reckless or intentional for an offence to have been committed).

For any European Protected Species of plant, the legislation makes it an offence to deliberately or recklessly pick, collect, cut, uproot or destroy any such plant. This applies to all stages of their biological cycle.

The European Protected Species most relevant to the LTS are otters and cetaceans (dolphins, porpoises and whales). Several cetacean species are regularly seen in Orkney waters. These include harbour porpoise, killer whale, minke whale, Risso's dolphin, white-sided dolphin. Sperm whales and humpback whales are also occasionally seen. Otters are known to be widespread in the Orkney Islands particularly in the vicinity of aquatic environments, either freshwater or marine.



## Wider Countryside Measures

There are a few bird species, either listed on Annex I of the Birds Directive or regularly occurring migratory species, for which Special Protection Areas are not appropriate in Scotland. For some other species, a large proportion of the population is not protected within SPAs. In both these cases, special measures outwith designated areas are of particular significance.<sup>21</sup>

Article 10 of the Habitats Directive encourages national governments, through their land-use planning and development policies, to manage landscape features which are of major importance for wild fauna and flora, particularly with a view to improving the ecological coherence of the Natura 2000 site network. Features which are essential for the passage and dispersal of wild species in the countryside, such as river corridors, and features which act as 'stepping stones' between sites such as small woods and ponds, are highlighted as particularly valuable.

The Scottish Executive also makes reference to wider countryside issues in its National Planning Policy Guideline on the Natural Heritage (NPPG 14). This guidance advises planning authorities that they should seek to safeguard and enhance the wider natural heritage beyond the confines of designated areas. NPPG14 states that the effect of a development proposal on the natural heritage can be a material consideration whether or not a designated area is likely to be affected.

## Priority Habitats and Species

Each local authority in the Highlands and Islands has developed its own Biodiversity Action Plan (BAP) that lists the priority habitats and species for its area. Although many of these habitats and species are covered by the range of areas protected by designations such as SPA, SAC and SSSI, it is recognized that important flora and fauna are also located in areas outwith these protected areas and should be considered when developing the objectives of the LTS. This includes species and habitats in freshwater and marine environments.

A total of 83 different species (or species types) and 21 distinct habitats have been identified as being of importance in the Orkney Islands. Lists of these are included in Appendix B.2 Lists of Priority Species and Habitats. Vulnerable marine habitats include maerl beds, areas of seagrass, *Zostera marina*, and horse mussel, *Modiolus modiolus* beds. These form important habitats for a further range of species and are sensitive to the blanketing effect of increased suspended solids in the water column. The horse mussel, in particular, is a long-lived and slow-growing species and, if damaged, a bed may take many years to recover.

Further information on the distribution and abundance of species and habitats in the county is available from The Orkney Biodiversity Records Centre which is located in Kirkwall Library.

## Roadside verges

Grass verges alongside roads provide habitats for a range of flora and fauna, and certain roadside plant species are particularly important in maintaining populations of insects, which in turn support other species. For example, the great yellow bumble bee, *Bombus distinguendus*, an important pollinator of flowering plants, is known to feed on red clover, a common roadside species. To allow these plants to complete the various stages of their life cycle Orkney Islands Council has a policy on the frequency and timing of grass cutting on verges.

## **7. Landscape**

### **SEA Objective:**

- To protect and enhance the quality and distinctiveness of the area's landscapes and townscapes

The relatively unvaried geology of Orkney, along with the modifying effects of glaciation during the last ice age, has resulted in a landscape in which the differences are often subtle rather than dramatic. Physical processes together with human influences which began when settlers first arrived on the islands over 5,000 years ago have helped create the diversity of landscapes visible in the Orkney Islands today. The high quality visual amenity of the islands is valued by its resident population and is a major factor in attracting the thousands of tourists who visit each year.

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<sup>21</sup> SNH website: [www.snh.gov.uk](http://www.snh.gov.uk)

Scottish Natural Heritage have carried out assessment of the Orkney landscape<sup>22</sup> enabling the landscape character to be described in a hierarchical framework which establishes the patterns of landscape variations. This is done by identifying and describing Regional Character Areas, Landscape Character Types and Island Character Areas. Explanations of these classifications are reproduced below:

### **REGIONAL CHARACTER AREAS**

*The Orkney archipelago is recognisable as a distinct landscape ‘region’, based on the general characteristics of geology, landform, land use and historical associations. It is also the fact that it is a group of islands that contributes to its unity of character, particularly in the importance of the sea. Its isolation from mainland Scotland, yet mutual inter-dependence, has created a strong identity for the county. It is concluded therefore, that the County of Orkney constitutes the ‘Orkney Regional Character Area’.*

### **LANDSCAPE CHARACTER TYPES**

*Landscape character types are tracts of countryside, defined at a more detailed level, which have a distinct character due to particular combinations of landform and land cover and a consistent pattern of constituent elements. Landscape character types are generic: they can be found anywhere distinct combinations of features occur.*

### **ISLAND CHARACTER AREAS**

*Although there are many similarities between the islands of Orkney, there are also many characteristics which reflect the individual history of each. For that reason, descriptions of ‘Island Character Areas’ have been included for the main inhabited islands. Each island contains several landscape character types.*

This assessment resulted in the identification of a total of 23 landscape character types in the Orkney Islands. These are:

Holms	Whaleback Island landscapes
Ridgeline Island Landscapes	Low Island Pastures
Undulating Island Pastures	Coastal Plain
Coastal Basins	Inclined Coastal Pastures
Coastal Granite Pastures	Isolated Coastal Knolls
Enclosed Bay Landscapes	Coastal Hills and Heath
Cliff Landscapes	Coastal Sand Landscapes
Peatland Basins	Loch Basins
Low Moorland	Plateau Heaths and Pasture
Rolling Hill Fringe	Moorland Hills
Glaciated Valley	Rugged Glaciated Hills
Urban and Rural Development	

A general description is provided of each Landscape Character Type and key characteristics and landscape sensitivities are listed. Advice is also provided on conservation and the potential for enhancement of the landscape. A brief summary of landscape character types and sensitivities of each of the Isles follows:

**North Ronaldsay** is the most north easterly of the Orkney Islands, lying approximately three miles to the north of Sanday, separated by the North Ronaldsay Firth. It is 5 km long by 2.5 km wide, and is predominantly flat with much of the land lying below 20m Above Ordnance Datum (AOD). Two landscape character types have been identified on the island: Low Island Pastures and Coastal Sand Landscapes. Coastal features, both natural (e.g. sand dunes) and built structures, (e.g. the stone dykes which surround the island’s coast) are susceptible to damage by the sea and the elements.

<sup>22</sup> Scottish Natural Heritage Review No 100, Orkney Landscape Character Assessment. Land Use Consultants, Glasgow (1998)



The island of **Sanday** in the northern isles is predominantly flat with much of the land lying less than 50m and it is noted for its sandy coastline. Three landscape character types have been identified on the island: Coastal Sand Landscapes, Low Island Pastures and Undulating Island Pastures

The landscape character classification of **Westray** and **Papa Westray** identifies eight landscape character types: Low Island Pastures; Ridgeline island Landscapes; Undulating Island Pastures; Coastal Hills and heaths; Cliff Landscapes; Loch Basins, and urban and Rural Development.

**Eday** is centrally located within the North Isles and has an oblong form with a north-south orientation. Eight landscape character types have been identified for Eday: Holm; Low Island Pastures; Coastal Basin; Inclined Coastal Pastures; Enclosed Bay; Cliff Landscape; Coastal Sand Landscape and Moorland Hills.

**Stronsay** is located in the Northern Isles, on the eastern edge of the archipelago. Nine landscape character types have been identified: Low Island Pastures; Holms; Ridgeline Island Landscapes; Loch Basin; Inclined Coastal Pasture; Plateau Heaths and Pasture; Coastal Basin; Coastal Sand Landscapes and Low Moorland.

**Rousay** is situated to the north east of the Mainland, separated by Eynhallow Sound. The island is more compact than most North Isles and is roughly circular in shape. Seven landscape character types have been identified on the island: Low Island Pastures; Loch Basin; Coastal Basin; Peatland Basin; Inclined Coastal Pastures; Moorland Hills and Coastal Hills and Heath.

**Egilsay** is a small oval shaped island to the east of Rousay, separated by Rousay Sound. Egilsay is wholly the Whaleback Island landscape character type.

**Shapinsay** is the closest of the North Isles to Kirkwall, lying less than 7 kilometres to the north east. Two landscape character types have been identified on the island: Ridgeline Island Landscape and Plateau Heaths and Pasture.

**Hoy** is the south westernmost island of Orkney, lying at the west end of Scapa Flow. Together with South Walls, which is joined to the south tip of Hoy by the narrow spit of 'The Ayre', it is the largest Orkney island after the Mainland. Eight character types have been identified: Whaleback Island; Inclined Coastal Pastures; Enclosed Bay Landscapes; Cliff Landscapes; Rolling Hill Fringe; Moorland Hills; Glaciated Valley and Rugged Glaciated Hills.

The island of **Flotta** is located in the south of Scapa Flow and is roughly 3 km long by 5 km wide at its broadest point. Three landscape types have been identified: Low Island Pasture, Low Moorland and Urban and Rural Development. The Flotta Oil Terminal, which is operated by Talisman Energy, is located close to the ferry terminal.

The Environment Report for the SEA of the Renewable Planning Framework for Orkney identified the following landscape changes in Orkney over the last 50 years:

- changes in vegetation cover and field patterns
- loss or deterioration of some distinctive features such as stone dykes, crofts and other buildings
- erosion of character due to the addition of telecommunications apparatus, aquaculture developments, wind turbines, roads, and other urbanising features
- new buildings that have not always reflected the settlement pattern, scale, design and materials that are appropriate to the landscape character.

#### National Scenic Area (NSA)

National Scenic Areas are areas of exceptional scenic value and comprise some of the best examples of Scotland's landscapes. The Hoy and West Mainland NSA is the only area of Orkney to have this designation and includes examples of several of the landscape character types listed above.

#### Gardens and Designed Landscapes

The Inventory of Gardens and Designed Landscape identifies gardens and designed landscapes in Scotland that are of national significance. These include private gardens, parks in country estates, public parks, cemeteries and botanical gardens. Three gardens and designed landscapes in the Orkney Islands are listed in the Inventory. Only one of these, Balfour Castle in Shapinsay, lies within the area covered by the Orkney Islands Inter-isles Connectivity Strategy. The designated area occupies the south-western corner of Shapinsay, surrounding the castle and Balfour village and extends down to the pier area.

## 8. Cultural heritage

### SEA Objectives:

- To preserve historic buildings, archaeological sites and other culturally and historically important features

### Sites of Archaeological Importance

The Orkney Islands have a rich cultural heritage, with a total of 365 Scheduled Ancient Monuments, representing periods dating from prehistoric times to the 20<sup>th</sup> century. Of these Scheduled Monuments, 37 are in the care of the Scottish Ministers. A number of these are located in the North and South Isles and are listed in **Table 8.1** below.<sup>23</sup>

**Table 8.1 List of properties in Orkney which are in the care of Historic Scotland**

INDEX NO.	NAME	ISLAND	GRID REFERENCE
90137	St Magnus Church	Egilsay	HY 466304
90122	Dwarfie Stane, rock-cut tomb	Hoy	HY 244005
90211	Hackness Battery and Martello Tower	Hoy	ND 338912
90163	Holm of Papa Westray chambered cairn	Papa Westray	HY 505523
90195	Knap of Howar houses	Papa Westray	HY484519
90035	Blackhammer chambered cairn	Rousay	HY 414276
90198	Knowe of Yarso chambered cairn	Rousay	HY 404279
90218	Midhowe Broch and settlement	Rousay	HY 371308
90219	Midhowe chambered cairn and remains	Rousay	HY 372306
90297	Taversoe Tuick chambered cairn and remains	Rousay	HY 426276
90243	Quoyness chambered cairn, Els Ness	Sanday	HY 677378
90231	Noltland Castle	Westray	HY 429488
90240	Pierowall Church (Lady Kirk)	Westray	HY 439488
90312	Cross-Kirk (Westside Church) and burial ground, Tuquoy	Westray	HY 455432
90337	Links of Noltland settlements	Westray	HY 428492
90079	Cubbie Roo's Castle	Wyre	HY 442264
90317	St Mary's Chapel	Wyre	HY 443264

The history of the twentieth century is also well represented throughout Orkney, largely due to the strategic importance of the islands during World Wars I and II. Scapa Flow was used as an anchorage for the British Naval Fleet during both wars and ships of the German High Seas Fleet were scuttled in Scapa Flow towards the end of World War I. Many of the ships were salvaged, but seven major wrecks remain on the seabed. These are protected under the Ancient Monuments and Archaeological Areas Act 1979 and are now popular with sport divers providing a significant contribution to Orkney's tourism industry. There are also a number of war graves in Orkney waters. Of these, HMS Royal Oak and HMS Vanguard are protected under the Orkney Harbour Byelaws 1977 which prohibit diving on these wrecks. HMS Vanguard lies off the coast of Flotta at 58 51.44' N, 003 06.14'W.<sup>24</sup> HMS Royal Oak and HMS Hampshire are controlled wrecks under the protection of Military Remains Act 1986.

A further 2,000 sites are listed on the Sites and Monuments Record.

There is a presumption in favour of the physical preservation of all scheduled ancient monuments and archaeological sites. Developments that would adversely affect such remains or their settings will only be permitted in exceptional circumstances, where there is no practical alternative site and where there are

<sup>23</sup> Historic Scotland, 2007

<sup>24</sup> Orkney Islands Council Department of Harbours

imperative reasons of over-riding need. Development which would affect other sites of archaeological interest not yet included on the Sites and Monuments Record may be permitted after the Islands' Archaeologist confirms that the significance of the remains are not such as to justify their physical preservation when judged against other material considerations and the possible benefits of the development.

The historic environment is vulnerable to impacts arising from maintenance of the existing transportation network as well as the provision of new infrastructure.

### Conservation Areas

Buildings may be 'listed' for their special architectural and/or historic interest. The 'listing' of buildings is carried out by Historic Scotland on behalf of the Scottish Minister. They are assigned to one of three categories (A, B or C(S)) according to their relative importance. Conservation areas are "areas of special architectural or historical interest, the character or appearance of which it is desirable to preserve or enhance", for the enjoyment and benefit of future generations.<sup>25</sup> Within Orkney there are four Urban Conservation Areas: Balfour Village in Shapinsay, St Margaret's Hope in South Ronaldsay, Kirkwall and Stromness. The latter two are regarded as 'outstanding' which means they are of national importance. The island of Eynhallow and the inner buffer zone of the World Heritage Site (Brodgar Rural Conservation Area) have been designated as Rural Conservation Areas.

A total of 642 listed buildings are located throughout the Orkney Islands. Comprehensive lists of all scheduled historic monuments and listed buildings in the Orkney Islands are presented in Appendix B.4.

## 9. Health

### SEA Objective:

- To promote human health through improving access to facilities and services

The population of the Orkney Islands is relatively healthy, with almost 73% reporting that they feel in good health. **Table 7.1** contains selected health statistics from data collected during the 2001 National Census and compares aspects of the health of the Orkney population with that of Scotland as a whole.

**Table 7.1: General health of the population of the Orkney Islands and Scotland<sup>26</sup>**

	Orkney Islands	Scotland
Total resident population	19,245	5,062,011
- % Good	72.55	67.91
- % Fairly good	20.79	21.94
- % Not good	6.66	10.15
Average age of a person with good health	34.94	32.86
Average age of a person with a limiting long term illness	60.22	57.94
Percentage of economically inactive people who are permanently sick/disabled	15.60	21.25
- % Having a limiting long term illness	17.43	20.31
- % Not having a limiting long term illness	82.57	79.69

Life expectancy in the Orkney Islands is also among the highest of all Scottish local authorities and since 2000 has generally displayed an increasing trend, with a slight decrease however to the year 2005. These figures are shown in **Table 7.2**.

**Table 7.2: Life expectancy at birth of residents of the Orkney Islands over the period 2000 – 2005<sup>27</sup>**

Gender	PERIOD			
	2000-2002	2001-2003	2002-2004	2003-2005
Males	75.4	75.9	76.5	76.3
Females	81.7	81.0	80.5	81.4

<sup>25</sup> The Orkney Islands Council Structure Plan 2001

<sup>26</sup> Scottish Executive National Census 2001 [www.scrol.gov.uk/scrol/browser](http://www.scrol.gov.uk/scrol/browser)

<sup>27</sup> Scottish Executive National Census 2001

The Scottish Index of Multiple Deprivation (SIMD) is used to measure health inequalities associated with low income and deprivation. Orkney has no neighbourhoods which register on the most deprived 15% in Scotland, if the 2004 SIMD composite indicator is used.

## 10. Population

### SEA Objective:

- To improve the connectivity of the Orkney Isles and sustain population change in a growth phase

Over the period between 1992 and 2004 population levels in the Orkney Islands have fluctuated, decreasing to a minimum of 19,210 in 2002 before increasing again to 19,500 in 2004. Birth rates over this period have decreased and the increasing trend in 2003 and 2004 was due to numbers migrating to the county slightly outweighing a falling birth rate and outward migration. This trend is illustrated in **Table 8.1**.

**Table 8.1: Population change, based on Orkney Islands Council 2006 Economic Review<sup>28</sup>**

Ended 30 June	Births	Deaths	Natural population change	Migration	Population
1992	262	241	+21	+129	19,710
1993	206	260	-54	+104	19,760
1994	257	247	+10	+40	19,810
1995	231	229	+2	+58	19,870
1996	217	242	-25	-45	19,800
1997	233	232	+1	+39	19,840
1998	200	244	-44	-246	19,550
1999	202	217	-15	-35	19,600
2000	163	220	-57	-63	19,480
2000	(revised)		-	-	19,290
2001	153	199	-46	-24	19,220
2002	176	210	-34	+24	19,210
2003	168	212	-44	+144	19,310
2004	167	224	-57	+247	19,500

These overall trends are predicted to continue until 2007, after which the population is predicted to begin to decline slowly as is shown in **Table 8.2** below.

**Table 8.2: Population estimates for Orkney 2006-2024<sup>29</sup>**

Year	Population Estimate
2006	19,779
2007	19,837
2008	19,831
2009	19,826
2010	19,811
2015	19,686
2020	19,439
2024	19,108

The values shown above do not include the internal population changes which are taking place within the Orkney Islands as a result of migration from the smaller islands towards the mainland of Orkney. Depopulation of these islands has given cause for concern for a number of years and initiatives are under way to try to reverse this trend. Changes in population levels of the North and South Isles during the period 1961 to 2001 are illustrated in **Table 8.3**

<sup>28</sup> General Register Office for Scotland (GROS)

<sup>29</sup> General Register Office for Scotland (GROS) estimates

**Table 8.3 Population trends in the Islands Covered by the Orkney Islands Inter-isles Connectivity Strategy for the period 1961 – 2001<sup>30</sup>**

ISLAND	POPULATION					
	1961	1971	1981	1991	2001	% change
<b>Eday</b>	198	179	147	166	121	-39
<b>Eqilsay</b>	54	39	23	46	37	-31
<b>Flotta</b>	123	73	178	126	81	-34
<b>Graemsay</b>	51	39	21	27	21	-59
<b>Hoy</b>	511	419	461	450	392	-23
<b>Mainland Orkney</b>	13,495	12,747	14,000	15,123	15,315	+13
<b>North Ronaldsay</b>	161	134	109	92	70	-57
<b>Papa Stronsay</b>	4	3	0	0	10	+250
<b>Papa Westray</b>	139	106	92	85	65	-53
<b>Rousay</b>	237	181	209	217	212	-11
<b>Sanday</b>	670	592	525	533	478	-29
<b>Shapinsay</b>	416	346	329	322	300	-28
<b>Stronsay</b>	497	436	420	382	343	-31
<b>Westray</b>	872	735	701	704	563	-35
<b>Wyre</b>	47	36	21	28	18	-62

Table 8.3 indicates that, between 1961 and 2001, four of the Isles experienced population decline in excess of 50%. These are Graemsay, North Ronaldsay, Papa Westray and Wyre.

One of the factors implicated in the migration to the Orkney mainland is believed to be geographical isolation. Due to the need to travel by ferry or air transport to get to the mainland of Orkney, residents of the Isles experience reduced ease of access to facilities and services on the mainland of Orkney and beyond. Ferry provision to North Ronaldsay, Papa Westray and Graemsay is limited, with only one scheduled ferry per week to North Ronaldsay and a Lift-On, Lift-Off service for freight at each of these terminals. Wyre has a more frequent Roll-On Roll-Off service but with a much smaller resident population the decrease of 18 residents is more significant.

More recent information on the Isles populations is available from the NHS Orkney Director of Public Health Annual Report for 2005-06 where the numbers of patients in each medical practice is listed. This information is presented in **Table 8.4** below.<sup>31</sup>

**Table 8.4 Numbers of patients registered with Orkney Isles practices in 2005-06**

GP PRACTICE	2001	2005/06
<b>Eday</b>	121	125

<sup>30</sup> Scotland's Census Results Online

<sup>31</sup> NHS Orkney Director of Public Health Annual Report for 2005-06

GP PRACTICE	2001	2005/06
Hoy and Flotta	473	387
North Ronaldsay	70	57
Rousay, Egilsay & Wyre	267	228
Sanday	478	502
Shapinsay	300	305
Stronsay & Papa Stronsay	353	363
Westray & Papa Westray	628	658

Graemsay unfortunately does not appear in Table 8.4 as its residents are registered with the Stromness medical practice.

Table 8.4 displays a trend towards an increasing population in some of the islands. However numbers for North Ronaldsay show a further decline as do those for the linked islands of Hoy and Flotta and Rousay, Egilsay and Wyre.

Geographical deprivation is one component of the Scottish Index of Multiple Deprivation in which parts of the Orkney Islands register within the top 15% most deprived in Scotland. Geographical deprivation is measured by ranking areas for geographical access to services. There are a total of 6,505 data zones in Scotland and the data zone ranked 1 is the most deprived. **Table 8.5** shows that most of the islands featured in the Strategy fall within the most geographically deprived 10% in Scotland.

**Table 8.5: SIMD ranking of areas in the Orkney Islands for geographical access to services**

INTERMEDIATE GEOGRAPHY – ISLES ZONE SO2000947			
Data zone	Islands	Population	SIMD ranking for geographical access to services
S01004968	Rousay, Shapinsay, Egilsay and Wyre	567	387 (top 6% most deprived)
S01004969	Sanday, Stronsay and North Ronaldsay	906	87 (top 2% most deprived)
S01004970	Eday, Westray and Papa Westray	749	43 (top 1% most deprived)
S01004971	South Ronaldsay (south), Hoy and Flotta	935	27 (top 1% most deprived)
S01004972	Burray and South Ronaldsay (north)	749	595 (top 10% most deprived)

## 11. Material assets

### SEA Objective:

- To reduce, re-use and recover waste

Orkney's geography presents a complex challenge for the provision of transport, as the archipelago of islands lends itself to a 'hub and spoke' provision of services rather than longitudinal provision as is the case in the Western Isles and Shetland. Present internal ferry services operate from the main terminals of Kirkwall and Stromness and the smaller terminals at Houton and Tingwall on the Orkney mainland to those of the North and South Isles. The ferry terminals in the Isles are located at Nouster in North Ronaldsay; Loth in Sanday; Rapness and Pierowall in Westray; Moclett in Papa Westray, Whitehall in Stronsay; Backaland in Eday; Balfour in Shapinsay; Brinyan in Rousay; Egilsay; Wyre; Graemsay; Lyness, Longhope and Moaness in Hoy; and Gibraltar Pier in Flotta. The internal air service operates from Kirkwall airport to landing strips on the islands of North Ronaldsay, Westray, Papa Westray, Sanday, Eday and Stronsay.

Transport-related development has the potential to affect material assets such as buildings, public amenity land and agricultural land. In addition, materials for construction and maintenance projects are sourced from quarries and borrow pits in Orkney.

Changes to the transport infrastructure which are proposed by the Orkney Islands Inter-isles Connectivity Strategy will require the use of considerable quantities of aggregates and other construction materials. Much of these materials would be sourced from Cursiter Quarry which is operated by Orkney Islands Council. However, it may also be necessary to obtain certain types of stone from an alternative location, which in this case would most likely be Norway. It is anticipated that, where possible, materials resulting from dredging operations on site will be re-used, in order to minimise the quantities of primary stone required.

## 12. Noise

### SEA Objective:

- To minimise the effects of environmental noise

Environmental noise due to transport activities is not currently viewed as a source of negative impact in the Orkney Islands due to the low level of transport. However noise will be considered in this assessment, as certain aspects of the construction works proposed by the Strategy have potential to affect the marine fauna of the area. Cetaceans, which are European Protected Species, are particularly sensitive to underwater noise. No information is presently available on background noise levels of the area.

## Summary of data collected in compiling an environmental baseline of the Orkney Islands

The Environmental Report features a summary of the data sources accessed in compiling this environmental baseline of the Orkney Islands. A copy of this summary (Table 6 in the Environmental Report) is also included below.

**Table 6: Summary of data collected in compiling an environmental baseline of the Orkney Islands**

DATA	SOURCE
Information on climate change	SNIFFER, 'A handbook of climate trends across Scotland', 2006 Climate Change The UK Programme 2006
Information on carbon dioxide emissions and contribution by transport	Defra e-Digest Environment Statistics, Global Atmosphere Scottish Executive, Key Scottish Environmental Statistics, 2006 Energy Savings Trust website. A Study into the Environmental Impact of Aviation in the Highlands and Islands Orkney Islands Council, Carbon Management Programme, 2006
Local air quality data for Kirkwall	Orkney Islands Council Department of Environmental Health
Water quality data ( freshwater and coastal) and Groundwater quality data	Scottish Environment Protection Agency (SEPA)
Information on areas at risk of flooding	Indicative River and Coastal Flood Map (Scotland), SEPA, 2005
Data on Agricultural Land Use in Orkney during 2002 and 2005	Scottish Agricultural Census 2001 - 2006
Information on contaminated land in Orkney	Orkney Islands Council Department of Environmental Health
Soil types in Orkney	Scottish Natural Heritage Review No 100, Orkney Landscape Character Assessment Changing Our Ways, Scotland's Climate Change Programme Scottish Executive (2006)
Geology of Orkney  Sites designated for their geological interest	British Geological Survey Orkney Islands Solid and Drift 1:100,000 Special Provisional Map <a href="http://www.fettes.com/orkney/geology">www.fettes.com/orkney/geology</a> The Orkney Local Plan
List of statutory and non-statutory	Scottish Natural Heritage (SNH) <a href="http://www.snh.gov.uk">www.snh.gov.uk</a>

DATA	SOURCE
designated natural heritage sites	Orkney Islands Council Local Plan
RSPB reserves in Orkney	RSPB website
European Protected Species	Scottish Natural Heritage (SNH) <a href="http://www.snh.gov.uk">www.snh.gov.uk</a>
Lists of Priority habitats and species in Orkney	Orkney Islands Council Local Biodiversity Action Plan
Information on Landscape Character Assessment	Scottish Natural Heritage Review No 100, Orkney Landscape Character Assessment
Lists of Scheduled Ancient Monuments and Listed Buildings	Orkney Islands Council Local Plan
Information on Conservation Areas	The Orkney Islands Council Structure Plan 2001 Historic Scotland, 2007
Location of protected wrecks in Scapa Flow	Orkney Islands Council Department of Harbours
General health of the populations of Orkney and Scotland	Scottish Executive National Census 2001
Life expectancy of residents of the Orkney Islands over the period 2000-2005	British Heart Foundation Website <a href="http://www.heartstats.org">www.heartstats.org</a> Scottish Executive and NHS Health Scotland healthy Living website <a href="http://www.InfoScotland.com">www.InfoScotland.com</a>
Population trends in the Orkney Isles 1961 – 2001	General Register Office for Scotland (GROS)
Numbers of patients registered with Orkney Isles practices in 2005-06	NHS Orkney Director of Public Health Annual Report for 2005-06
SIMD ranking of areas in the Orkney Islands for geographical access to services	Scottish Executive website <a href="http://www.scotland.gov.uk/stats/">www.scotland.gov.uk/stats/</a>
Source of aggregates used in Orkney	Orkney Islands Council Roads Department



## APPENDIX: B.1

### Natural Heritage Sites in the Orkney Islands

#### Abbreviations

SSSI:	Site of Special Scientific Interest (notified under the Wildlife and Countryside Act 1981)
SPA:	Special Protection Area (EC Wild Bird Directive (79/ 409/ EEC)
pSPA:	proposed Special Protection Area
RAMSAR:	internationally important wetland site
NCR:	Nature Conservation Review Site- nationally important biological sites
NSA:	National Scenic Area
RSPB Reserve:	Royal Society for the Protection of Birds Reserve
SAC:	Special Area of Conservation (EC Habitats and Species Directive (92/ 43/ EEC)
GCR:	Geological Conservation Review site- nationally important Earth Science Sites
LNR:	Local Nature Reserve
BBP:	British Breeding Population

#### BIRSAY

SITE	DESIGNATION	AREA HA	INTEREST
Glims Moss and Durkadale	SPA/ SSSI/ NCR/ RSPB Reserve (part)	225.3	Raised mire and most northerly example of a calcareous valley mire in Britain.
Kirbuster Hill	local site ornithological	25	Heather Moorland
Loch of Banks	SSSI/ RSPB Reserve	44	Basin Mire complex of ornithological & botanical interest. Hen harrier.
Loch of Boardhouse	Local Nature Conservation Site	na	Breeding record for Red-throated Diver; wintering wildfowl
Loch of Hundland	local site ornithological	183	Loch, Wet heath and wetland. Important for passage waders
Loch of Isbister and the Loons	SAC / SSSI/ RSPB Reserve	104	Basin Mire complex of botanical and ornithological interest.
Loch of Sabiston	local site ornithological	41	Loch and wetland margins
Marwick Head	SPA/ SSSI / NCR/ RSPB Reserve	9.1	One of three biggest seabird colonies in Orkney (4% of BBP Guillemots, 2% of BBP Razorbill)
Point of Buckquoy,	local site geological	31.6	Unique exposure demonstrates consequences of oscillation in the level of the Orkney Lake during Sandwick Fish Bed times
Tufta, Loch of Boardhouse	local site ornithological	15	Wetland
Unigarth	local site ornithological	13	Wet grassland
Whitaloo Point	local site geological	0.61	A typical monoclinial fold in Upper Stromness Flags

## EDAY

SITE	DESIGNATION	AREA HA	INTEREST
Doomy and Whitemaw Hill	SSSI	209	Sub-montane heath supporting Whimbrel & Arctic Skua both at nationally important levels
Greenan Nev Coast,	local site geological	6	Exposure of Eday marls of interest in the study of Palaeo environments
Loch of Doomy	local site ornithological	20	Loch and dune system
Loch of London	local site ornithological	12	Wet grassland and heather moorland
Mill Loch	SSSI	23.7	Dense breeding concentration of Red Throated Diver.
Red Head	local site ornithological	111	Moorland and coastal heath
Newbiggin to Neven Point,	local site geological	22.7	Good section of the western limb of the Eday Syncline
Sealskerry	local site ornithological	28	Dunes, Coastal grassland & reverted grassland
South Fersness Bay,	local site geological	15.4	Good section of the western limb of the Eday Syncline
Ward Hill	local site ornithological	179	Moorland habitat

## EVIE & RENDALL

SITE	DESIGNATION	AREA HA	INTEREST
Burn of Ellibister, Rendall	local site ornithological	16	Low lying wet Heathand fen. Important for hunting raptors
Burns of Blubberdale & Bluebraes, Rendall/ Firth	local site ornithological RSPB Reserve (part)	264	Low lying wet Heathand fen. Important for hunting raptors
Loch of Brockan, Rendall	local site ornithological	17	Lochan important for wintering wildfowl
Loch of Vastray, Rendall	local site ornithological	2	Small shore- side loch, otter have been present.
North Mainland Coast	local site ornithological	na	wintering waders
Oyce of Isbister	local site ornithological	10	Area of saltmarsh and rough grassland, important for wintering wildfowl and waders
Peerie Water, Evie	local site ornithological	30	Loch and heather moorland
Quoyhenry, Rendall	local site ornithological	10	Low lying wet Heathand fen. Important for hunting raptors
Sands of Evie	local site geological	0.27	Outcrops of Aeolianite unique in Scotland
West Mainland Moorland	SPA/ SSSI/ NCR / RSPB Reserve (part)	2523	Sub- Montane moorland. Wet & dry heaths with extensive blanket bog. Red-throated Diver and Short Eared Owl. Nationally important Hen Harrier Site.

## FIRTH & SUNNYBRAE

SITE	DESIGNATION	AREA HA	INTEREST
Barebrecks, Firth	local site ornithological	62	Low lying wet Heath and fen. Important for hunting raptors

Binscarth, Firth	local site botanical	3.25	Broadleaved plantation
Burns of Blubberdale and Bluebraes, Rendall / Firth	local site ornithological RSPB Reserve (part)	264	Low lying wet Heath and fen. Important for hunting raptors
Heddle, Firth	local site botanical	58	Heath and willow scrub
Hewing, Firth	local site ornithological	11	Low lying wet Heath and fen. Important for hunting raptors
Keelylang Hill and Swartabeck Burn	SPA/ SSSI	925.6	Nationally important moorland. Ornithological interest (2% of BBP of Hen harrier, 1% of BBP of Merlin)
Loch of Wasdale, Firth	local site ornithological	28	Low lying wet heath & heather
North Mainland Coast	local site ornithological local nature conservation importance (1) & (2)	na	wintering waders
Rennibister, Firth	local site ornithological	9	Area of rank grazing.
Rossmyre, Firth	local site ornithological	13	Wet Moorland dominated by heather
The Ouse and Heddle, Firth	local site botanical	71.3	Saltmarsh, Wet Moorland dominated by Heather. Important area for hunting raptors
Wideford Hill, St Ola	local site ornithological	199	Large hilltop area of heather moorland with, in places extensive stands of Juncus spp.

### GRAEMESAY, HOY & FLOTTA

SITE	DESIGNATION	AREA HA	INTEREST
Berry Lochs, Hoy	local site ornithological	na	
Bring Head, Hoy	local site botanical	na	"Undercliff" with residual native woodland
Bu, Moaness, Hoy	local site botanical	na	Native woodland
Burn Of Ore, Hoy	local site botanical	na	Botanically rich fen
Calf of Flotta	local site botanical	na	Woodland understory vegetation
Hap, Graemesay	local site botanical	na	Dune and Machair
Hill of White Hamars	SWT reserve, local site botanical	71.5	Coastal Heaths and grasslands. Lichen Rich Heaths.
Hoglins Water, Hoy	local site ornithological	na	
Hoy	SSSI / SPA/ SAC/ RSPB Reserve (part)/ NCR/ GCR/ NSA (part)	9499.9	geology, geomorphology, great skuas, red throated divers, > 20000 seabirds, wet & montane heath, petrifying tufa springs, woodland, moorland birds, upland heaths
Hoy and West Mainland	NSA	c15,000	Landscape.
Hoy Lodge Marsh	local site botanical	na	Marsh and small loch
Lyrawa bay, Hoy	local site botanical	na	Saltmarsh
Lyrawa Plantation, Hoy	local site ornithological	na	

Melsetter Coast section, Hoy	local site geological	na	Outcrops of the Hoy Lavas
Melsetter Links, Hoy	local site botanical	na	Machair and Dune
Mill Burn and Mill Bay,	local site botanical	na	Saltmarsh
Muckle Head and Selwick	SSSI/ GCR / NSA (part)	1.7	Geological site due to locally important raised beach deposits
North and South burns of Quoys	local site botanical	na	Native woodland, Orchid colony
North Coast of Graemsay	local site geological	na	Exposure of the lower section of the Stromness Flags and Crystalline basement
North Hoy Coast	local site geological	na	Exposures of the Hoy Volcanics and the Hoy Sandstone in their type area
Pegal Glen, Hoy	local site botanical	na	Native scrub woodland
Quoy, South Walls	local site ornithological	9	Fragment of heath with rough grassland and a small pool.
Quoys Glen	local site botanical	na	Native Scrub woodland
Rottenloch, Hoy	local site ornithological	na	
Rysa Bay	local site botanical	na	Reedbeds
The Pinnacles, Hoy	local site botanical	na	Native woodland
Wastlee Moor, Hoy	local site ornithological	na	
Whaness Burn, Hoy	local site botanical	na	Native scrub woodland
Witter and Bu Hill, Hoy	local site ornithological	na	
West Hill & Golta	local site ornithological	325	Heather Moorland

## HARRAY & STENNESS

SITE	DESIGNATION	AREA HA	INTEREST
Anderswick, Stenness	local site ornithological	45	Moderately grazed wet moorland. Important area for feeding raptors.
Bigswell, Stenness	local site ornithological	71	Moderately grazed wet moorland. Important area for feeding raptors.
Breckan, Harray	local site ornithological	22	Wetland favoured by migrant waders and wintering wildfowl
Lochs of Harray and Stenness	SSSI/SAC (Loch of Stenness)/ c RAMSAR (under review)/ NCR	1930 (792 cSAC)	Lochs which exhibit unique salinity gradient and vegetation community. Important for wintering wildfowl.
Brogar, Loch of Harray	local site ornithological	16	Wetland favoured by migrant waders and wintering wildfowl
Harray Road End, Moorside Stenness	SWT reserve (part) Local Ornithological site	28	Low lying wet heath and heather
Hoy and West	NSA	c15,000	Landscape

Mainland			
Kirk Quoy, Loch of Harray, Harray	local site ornithological	2	Wetland favoured by migrant waders and wintering wildfowl
Knowes of Trotty, Harray	local site ornithological	16	Low lying wet heath and Heather
Loch of Bosquoy, Harray	local site ornithological	59	Medium sized loch with associated margin & wet grassland. Important for wintering wildfowl
Neterborough, Harray	local site ornithological	19	Wetland favoured by migrant waders and wintering wildfowl
Orphir and Stenness Hills	SPA/ SSSI	890.4	Ornithological and Botanical interest including 3% of BBP of Hen Harrier and dwarf shrub, deer grass and lichen heath communities.
Quoyer, Loch of Harray, Harray	local site ornithological	17	Wetland favoured by migrant waders and wintering wildfowl
Reed Meadow, Loch of Harray, Sandwick	local site ornithological	10	Wetland favoured by migrant waders & wintering wildfowl
Setter, Harray	local site ornithological	76	Low lying wet heath and Heather
Stenness Kirk, Loch of Harray	local site ornithological	5	Wetland favoured by migrant waders and wintering wildfowl
The Shunan, Harray	local site ornithological	17	Loch complex surrounded by rough grassland and heather
West Mainland Moors SSSI Fringes	local site ornithological	498	The main moorland area omitted from the SSSI is on its western margins. Areas of blanket bog and heather moorland.

## HOLM & WIDFORD

SITE	DESIGNATION	AREA HA	INTEREST
Blown, Tankernes	local site ornithological	21	Moorland and Bog. Important for hunting raptors
Breckquoy, Holm	local site ornithological	153	Moorland and Bog. Important for hunting raptors
Culdigeo, Holm	local site ornithological	89	Moorland and Bog. Important for hunting raptors
Gaitnip Hill, Holm	local site ornithological	120	Moorland and Bog. Important for hunting raptors
Heathery Howes, Holm	local site ornithological	221	Moorland and Bog. Important for hunting raptors
Loch of Ayre, Holm	local site ornithological	9	Loch with wetland. Important for wintering wildfowl
Loch of Graemshall, Holm	local site ornithological	17	Loch with reed bed. Important for migrants, feeding terns and gulls
Rose Ness, Holm	local site ornithological	63	Coastal heath, heather moor and rough grassland
Swart Howe, Holm	local site ornithological	101	Moorland and Bog. Important for hunting raptors

The Loons, Holm	local site ornithological	9	Wetland
White Moss	local site ornithological	40	Moorland and Bog. Important for hunting raptors
Widford Burn, St Ola	local site ornithological	60	Area of wetland and scrub woodland important for attracting migrants

## NORTH RONALDSAY

SITE	DESIGNATION	AREA HA	INTEREST
Ancum loch	local site ornithological	6	Loch with wet grassland
Bride's Ness	local site ornithological	13	Overgrown loch and wet grassland
Gretchen Loch	local site ornithological	24	Loch and grazed grassland
Hooking Loch	local site ornithological	9	Overgrown Loch
Kirbist	local site ornithological	1.5	Marsh area
Loch of Garso	local site ornithological	3	Loch with marginal wet grassland
Whole Island	local site of nature conservation importance		
North Ronaldsay Coast	local site ornithological		black guillemot and wintering waders

## ORPHIR & SCAPA

SITE	DESIGNATION	AREA HA	INTEREST
Akla, Orphir	local site ornithological	75	Heather moorland, wetter areas dominated by Juncus
Berryhill, St Ola	local site ornithological	15	Heavily grazed heather moorland
Brig 'o' Waithe	local site ornithological	21	Complex site of Estuarine & lochside habitat
Burn of Greenigoe, Orphir	local site ornithological	54	Heavily grazed heather moorland
Hill of Midland, Orphir	local site ornithological	57	Heather Moorland
Hoy and West Mainland	NSA	15,000	landscape
Keelylang Hill and Swartabeck Burn	SPA/ SSSI/ RSPB Reserve (part)/ NCR	925.6	Nationally important moorland. Ornithological interest (2% of BBP of Hen harrier, 1% of BBP of Merlin)
Loch of Kirbister, Orphir	local site ornithological	3	Lightly grazed wetland
Longhouse, St Ola	local site ornithological	20	Wetland dominated by Willow scrub. Important roost for migrant species
Orphir and Stenness Hills	SPA/ SSSI	890.4	Ornithological and Botanical interest including 3% of BBP of Hen Harrier and dwarf shrub, deer grass and lichen heath communities.
The Fidge, Swanbister	local site ornithological	33	Salt marsh and fresh water marsh. Dense stands of Iris and Juncus spp.
Tuskerbister, Orphir	local site ornithological	65	Moderately grazed wet moorland. Important area for feeding raptors.

Waulkmill	SSSI/ RSPB Reserve (Part)	71	Wide range of Nature conservation interest. Sandflat, Saltmarsh Herb rich low cliffs & heather heath. Botanical & lepidopteral interest
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### PAPA WESTRAY

SITE	DESIGNATION	AREA HA	INTEREST
Backskaill	Local site ornithological	3	Wetland
Hookin	local site ornithological	1	Wetland
Links of Moclett	local site botanical	na	Dune Grassland
Loch of Ness	Local site ornithological	6	Wetland
Loch of St Tredwell	local site ornithological	50	Loch with marginal wetlands
Loch of Via	local site ornithological	2	Large iris bed with open water
Mayback	local site ornithological	4	Wetland
North Hill	SPA/ SSSI/ RSPB Reserve/ NCR	206	Regionally important maritime heath vegetation community. Arctic Tern & Arctic Ski. Ornithological importance (4% of BBP of Arctic Skua)
Wellpark	local site ornithological	4	Wetland

### ROUSAY, EGILSAY & WYRE

SITE	DESIGNATION	AREA HA	INTEREST
Maeness, Egilsay	local site botanical	6	Rich Wetland habitat
Loch of the Graand, Egilsay	local site ornithological	6	Lochs with wet grassland
Warsett, Egilsay	local site ornithological	2	Grassland with marsh
Loch of Wasbister, Rousay	local site ornithological	42	Loch with unimproved marginal fringe, wet grassland.
Lochs of Watten & Welland, Egilsay	local site ornithological	6	Marshland site around two lochs
Manse loch, Egilsay	local site ornithological	10	Loch with wet marsh
Rousay	SPA (part)/ SSSI/ RSPB Reserve (part)	2313 (633.4 pSPA)	Ornithological and Botanical interest. Maritime & wet heath, Heather dominated moorland & high altitude plant communities. Arctic tern colony (15% of BBP) Arctic Skua Population (3% of BBP) Hen Harrier (2% of BBP)
The Taing, Wyre	local site botanical	15	Area of rough grazing
Trumland, Rousay	local site botanical	4.8	Broad leaved plantation
Whitelett, Egilsay	local site ornithological	5	Marshy grassland.

## SANDAY

SITE	DESIGNATION	AREA HA	INTEREST
Backaskail, Sanday	local site ornithological	3	Small wetland area with dense iris beds
Bea Loch, Sanday	local site ornithological	67	Loch with reedbeds
Central Sanday	SSSI/ GCR	654.7	Machair and other blown sand shingle landforms unique in North Scotland. Botanical and Ornithological interest
Colli Ness, Sanday	local site ornithological	27	Area of Saltmarsh and shingle spit Important hunting area for raptors
Doun Helzie, Sanday	local site geological	89.8	Beach Dune and Machair association
East Sanday Coast	SSSI/ SPA(1515ha)/ RAMSAR	1607.3	Wintering waders (purple sandpiper, turnstone), common seal.
Grunavi Head, Sanday	local site ornithological	12	Small area of degraded moorland.
Hegglic Ber, Sanday	local site geological	9.4	Coarse pebbly and conglomeratic facies of Lower Eday Sandstone
Lochend	local site ornithological	6	Small area of marsh, dominated by Iris, mareetail and bog bean.
Mires of Whip, Sanday	local site ornithological	3	Wetland
Northwall	SSSI	251.3	Botanically diverse Machair . Largest extent of machair outside the Western isles
Roos Loch, Sanday	local site ornithological	20	Loch with stoney shoreline bordered by rough grassland
Sanday	SAC (marine)	10971.7	Common seal
Scar, Sanday	local site geological	na	Glacial erratic
Spaney Geo, Sanday	local site ornithological	17	Relict area of rank grass and short heather.
Start Island, Sanday	local site ornithological	24	Small tidal island dominated by grassland but with a small wetland.
Tafts Ness	local site ornithological	86	Rough grassland with small pools and wet areas.
Westbrough, Sanday	local site ornithological	7	Wetland with open water
Whitemill Sanday	local site ornithological	106	Grazed machair type habitat with open water & reedbed. Important hunting area for raptors

## SANDWICK

SITE	DESIGNATION	AREA HA	INTEREST
Bay of Skaill	SSSI/ GCR	7.85	Middle Devonian Fish beds with fossil plant community
Bookan Quarry, Sandwick	local site geological	0.38	Exposure of the Sandwick fish beds
Breck of Linqoy, Sandwick	local site ornithological	12	Wetland. Raptor hunting area



Brig 'o'Waithie	local site ornithological	21	Complex site of Estuarine and lochside habitat
Burn of Cruland, Sandwick	local site ornithological	44	Heather moorland and wetland Raptor hunting area
Burn of Ess, Sandwick	local site ornithological	14	Wet grassland and Heather
Cruaday Quarry	SSSI/ GCR	6.8	Outstanding geological importance due to preservation of the fossil bearing rock known as "sandwick fish beds"
Decca Station, Loch of Harray, Sandwick	local site ornithological	25	Wetland favoured by migrant waders and wintering wildfowl
Deepdale, Loch of Stenness, Sandwick	local site ornithological	26	Wetland with rough grassland and willow scrub
Hestwall, Sandwick	local site ornithological	20	Wetland
Hoy & West Mainland	NSA	c15,000	Landscape
Loch of Clumly, Sandwick	local site ornithological	38	Loch with extensive marginal wetlands. Important for wintering wildfowl
Loch of Rosemire	local site ornithological	3	Small loch and wet grassland
Loch of Skail	local site ornithological	77	Small loch with marginal wetland. Important for overwintering wildfowl
Lyking Quarry, Sandwick	local site geological	0.58	Exposure of Sandwick Fish Beds
Mill Dam of Rango	local site ornithological	13	Small loch with marginal wetland
Orr Shun, Sandwick	local site ornithological	23	Wet grassland and Heather
Quholm, Sandwick	local site ornithological	26	Wetland with rough grassland and willow scrub
Scarwell Quarry, Sandwick	local site geological	0.01	Exposure of Sandwick Fish Beds
Southerquoy, Sandwick	local site ornithological	69	Small marsh, maritime heath.
Stones of Via, Sandwick	local site ornithological	4	Wetland
Stromness Heaths and Coast	SAC/ SSSI/ GCR/ NCR / NSA (part)	755	Prime example of coastal vegetation communities with associated breeding birds. Notable <i>Primula scotica</i> colonies. Coastal Geomorphology
Wester Voy, Loch of Stenness, Sandwick	local site ornithological	2	Wet Marginal lochside.

## SHAPINSAY

SITE	DESIGNATION	AREA HA	INTEREST
Ayre of Vasa	local site geological	13.1	Complex cusped foreland
Lairo Water and the Ouse	local site ornithological	26	Inter tidal sand and mud, saltmarsh and coastal grassland
Mill Dam	RSPB Reserve	15	Marshland
Swart Helligeo, East Hill	SWT reserve (part)	102	Marginal moorland, Coastal heath and marsh
The Galt	local site ornithological	15	Area of degraded maritime heath.
Vasa Loch, Shapinsay	local site ornithological	7	Lochs with wet Grassland
Veantraw Bay,	local site geological	17.9	Complex of shingle depositional landforms

## SOUTH RONALDSAY & BURRAY

SITE	DESIGNATION	AREA HA	INTEREST
Aikers, South Ronaldsay	local site ornithological	14	Open water and grazed wetland
Ayre of Cara, South Ronaldsay	local site geological	na	Provides opportunity for study of rates of accretion and erosion due to the construction of the Churchill Barriers
Barth Head, South Ronaldsay	Local Nature Conservation Site	na	Coastal / maritime heath
Blows Moss, South Ronaldsay	local site ornithological	20	Wetland. Important hunting area for raptors
Burwick loch, South Ronaldsay	local site ornithological	6	Wetland with no open water
Cleat, South Ronaldsay	local site botanical	na	Coastal maritime heath from Sandside to Lay Taing
Croo Stone Vent coast section, South Ronaldsay	local site geological	na	Largest and most complex vent to be found in Orkney
Dale Moss, South Ronaldsay	local site ornithological	20	Heather Moorland and wetland. Important raptor hunting area
Dam of Collie, South Ronaldsay	local site ornithological	7	Grazed wetland. Hunting area for short eared owls
Dam of Hoxa, South Ronaldsay	local site ornithological	78	Open water and rough grassland with marsh
Echna Loch	Local Nature Conservation Site	na	Breeding Wigeon; wintering wildfowl
Glimps Holm	Local Nature Conservation Site	na	Arctic Tern colony; Common Gull colony
Graemston Loch, South Ronaldsay	local site ornithological	8	Loch and marginal wetland with willow scrub
Green Head, South Ronaldsay	Local Nature Conservation Site	na	Maritime heath

Grim Ness, South Ronaldsay	local site ornithological	42	Heavily grazed heather dominated headland
Herston Bay	local site ornithological	na	wintering waders
Honeysgeo, South Ronaldsay	local site botanical	na	Dunes
Hoston Bay, South Ronaldsay	Local Nature Conservation Site	na	Heath with Juniper
Hoxa Dam South Ronaldsay	local site botanical	na	Wetland
Hoxa, South Ronaldsay	local site geological	na	Composite depositional structure
Hunda, Burray	local site ornithological	83	Degraded grassland and heather moorland.
Klondyke, Burray	local site ornithological	105	Degraded heather moorland, areas of wet heath with cotton grass and <i>Juncus</i> spp.
Liddel Loch, South Ronaldsay	local site ornithological	14	Loch and wet rough grassland and maritime heath. Important for wintering wildfowl
Loch of Lythe, South Ronaldsay	local site ornithological	6	Small loch with surrounding Wetland. Important for wintering wildfowl
Newark Bay, South Ronaldsay	local site botanical	na	Dune and machair
No 4 Barrier	local site botanical	na	Very high botanical interest
Sandy Hill, South Ronaldsay	local site botanical	na	Heath with Juniper
North Links, Burray	local site ornithological	130	Machair like habitat and sand dune with marsh
Sounds Loch, South Ronaldsay	local site ornithological	33	Wet rough grassland
Old Head to Halcro Head, South Ronaldsay	local site geological	na	Shows relationship of coastal morphology to geological structure.
South Links, Burray	Local Nature Conservation Site	na	Wintering waders; seal haul out; Orkneys only site for Dark Green Fritillary
Sutherlands Links, Burray	Local Nature Conservation Site	na	Major site for <i>Bombus distinguendus</i>
The Altar, South Ronaldsay	local site geological	na	Demonstrates the influence of jointing on the resultant coastal landforms
Vensilly Hill, South Ronaldsay	local site botanical	na	Wetland
Ward Hill (3 separate sites)	Local Nature Conservation Site	na	Upland and maritime heath; breeding sea, moorland and wetland birds
Ward Hill Cliffs	SSSI	35.57	Floristically rich cliff top plant communities. Breeding Grey seals.
Ward Hill, South Ronaldsay	local site botanical	na	Species Rich Heath
Weddell Point	Local Nature Conservation Site	na	Arctic Tern colony; Little Tern breeding site
Windbrek, South Ronaldsay	local site botanical	na	Bog

## ST. ANDREWS & DEERNESS

SITE	DESIGNATION	AREA HA	INTEREST
Bay of Suckquoy, Toab	local site botanical	28.5	Saltmarsh
Braebuster Ness, Deerness	local site ornithological	6	Headland with wetland and open water
Denwick	SSSI/ GCR	0.5	Geological site. Best example of a multiple till section in Orkney
Eves Loch, Deerness	local site ornithological	9	Wetland with open water
Greenock, Tankerness	local site ornithological	56	Wet heath and Grassland
Head of Work, St Ola	local site ornithological	37	Heavily grazed maritime heath
Kirkwall airfield, St Ola	local site ornithological	18	Heather and grassland. Important raptor hunting site
Loch of Carness, St Ola	local site ornithological	17	Small loch and associated wetland
Loch of Lakequoy, Tankerness	local site ornithological	15	Coastal wetland and lagoon, important for wintering and migrant waders
Loch of Ouse, Deerness	local site ornithological	27	Wetland with open water
Loch of Tankerness, Tankerness	local site ornithological	84	Loch and wetland margins. Important to wintering wildfowl
Loch of Yinstay, Tankerness	local site ornithological	23	Loch with two areas of rank grassland.
Mirkady Point, Deerness	local site ornithological	15	Shingle spit. Also of Geomorphological importance
Mossclair, Tankerness	local site ornithological	8	Wet heath and Grassland
Mull Head	LNR	na	Botanical, ornithological and geomorphological interest
Newbiggin, Tankerness	local site ornithological	7	Coastal wetland and lagoon, important for wintering and migrant waders
Point of Ayre, Deerness	local site geological	na	Area of basaltic lava flow.
Sebay, Toab	local site ornithological		Saltmarsh
South Coast of Deerness	local site geological	51.6	Section showing transition from Rousay Flag series to Lower Eday Flag series.
Swarsquoy, Tankerness	local site botanical	14.8	Saltmarsh and unique double Ayre of Geomorphological importance
Rerwick Head, Tankerness	Local Nature Conservation Site	na	Major site for <i>Bombus distinguendus</i>
Tarracliff, Deerness	local site geological	31.8	Section showing transition from Rousay Flag series to Lower Eday Flag series.
Veddertownmail, Tankerness	local site ornithological	9	Area of wet heath and grassland

Wideford Burn, St Ola	local site ornithological	60	Area of wetland and scrub woodland important for attracting migrants
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## STROMNESS

SITE	DESIGNATION	AREA HA	INTEREST
Brunt Hill, Stromness	local site ornithological	70	Heavily grazed heather.
Hoy and West Mainland	NSA	5,000	Landscape
South Stromness Coast, Stromness	local site geological	na	Crystalline basement rock with overlying Stromness flags. Lead mineralization
The Loons, Stromness	local site ornithological	32	Wetland with rough grassland and willow scrub. Raptor hunting site

## STRONSAY

SITE	DESIGNATION	AREA HA	INTEREST
Auskerry	SSSI/ SPA	101.97	Arctic terns and storm petrels.
Blan Loch, Stronsay	local site ornithological	22	Dune and Machair like grassland
Bleaching Knowe, Stronsay	local site ornithological	1	Small loch with marginal wetlands
Bruce's Loch Stronsay	local site ornithological	1	Small loch with marginal wetlands
Burgh Head	local site ornithological	47	Grassland and maritime heath.
Burial Ground Loch, Stronsay	local site ornithological	2	Small lochan with dry grassland
Cro Taing Loch, Stronsay	local site ornithological	2	Small loch with marginal wetlands
Grice Ness, Stronsay	local site ornithological	0.5	Small lochan with dry grassland
Kent's Pond	local site ornithological	1	Grassland and two small pools with little emergent vegetation.
Lea Shun, Stronsay	local site ornithological	51	Loch with wet margins, machair like grassland.
Little Water, Stronsay	local site ornithological	5	Rough grassland and wet marsh
Loch of Matpow, Stronsay	local site ornithological	6	Loch with wet grassland and marsh
Loch of Rothiesholm, Stronsay	local site ornithological	15	Freshwater loch and wetland favoured by migrant waders and wintering wildfowl
Miekle water, Stronsay	local site ornithological	48	Lochs with associated wetlands
Mill Bay, Stronsay	SSSI/ GCR	1.9	Geological: Classic shelly till with paleo-geomorphological

			importance.
Papa Stronsay	local site ornithological	82	Eutrophic loch and associated wetland.
Rothiesholm, Stronsay	local site ornithological	382	Heather dominated moorland
South east Stronsay	Local Nature Conservation Site	na	Ornithological interest
Straenia Water, Stronsay	local site botanical	na	Shingle Ayre and Freshwater Lagoon

## WESTRAY

SITE	DESIGNATION	AREA HA	INTEREST
Ayre of Roadmire	local site ornithological	4	Small marsh and lochan with reed bed favoured by migrant waders and wildfowl
Fribo Marsh	local site ornithological	4	Marsh area, breeding ducks and waders
Loch of Burness, Westray	local site ornithological	26	Loch and wetland margins. Wetland favoured by migrant waders and wintering wildfowl
Loch of Garth, Westray	local site ornithological	13	Machair type grassland and wetland
Taftend, Westray	local site ornithological	7	Dry Marshland
Loch of Saintear, Westray	local site ornithological	16	Loch and wetland favoured by migrant waders and wintering wildfowl
Loch of Swartmill, Westray	local site ornithological	34	Loch with well developed marginal marshes
Loch of Tuquoy, Westray	local site ornithological	19	Machair type grassland
Mae Sand, Westray	local site botanical	na	Machair plain
South Westray Coast	local site ornithological site of local nature conservation importance	na	wintering waders
The Ouse, Westray	local site ornithological	1	Narrow shingle spit.
West Aikerness, Westray	local site ornithological	67	Dry maritime grassland with lochans
West Westray	SPA/ SSSI/ NCR/ RSPB reserve (part)	371.97	Seabird Colonies. Largest colonies of Guillemots & Kittiwake in the British Isles. Maritime grassland & Maritime sedge heath communities.

## UNINHABITED ISLANDS

SITE	DESIGNATION	AREA HA	INTEREST
Calf of Eday	SPA/ SSSI	242	Nationally important cormorant colony; 3% of British breeding population. Seabird assemblage
Cava	local site ornithological	65	Low lying heather clad.
Copinsay	SPA/ SSSI/ RSPB Reserve	151.8	Nationally important populations of guillemots (4% of BBP) & Kittiwake (2% of BBP) Other ornithological & botanical interest
Damsay	local site ornithological	21	Important area for grey and common seals.
Eynhallow	SSSI	102.7	Ornithological site with history of study. Important common seal haul out.
Faray and Holm of Faray	SAC (marine) (785ha)/ SSSI	116.62	Important area for grey seals.
Gairsay Hill	local site ornithological	140	Heather moorland area which otters have frequented.
Holm of Papa Westray	SPA/ SSSI	47.6	Black Guillemot colony (1% of BBP) and other ornithological interest
Rysa Little	local site botanical	na	
Linga Holm	SWT reserve	56	Important for Grey Seals.
Muckle and Little Green Holm	SSSI	53	Nationally important grey seal breeding colony (3% of BBP)
Pentland Skerries	SPA/ SSSI	}168	Maritime grassland, and bare rock skerries. Large arctic tern colony.
Swona	SPA/ SSSI		Grassy island with feral cattle. Cliffs up to 25m. Arctic Terns
South Fara	local site ornithological	na	
Switha	SPA/SSSI	57.4	Barnacle Geese roost
Sule Skerry	SPA/ SSSI/ NCR	15.6	Puffin colony (12% of BBP) 2 % of BBP of Shags
Sule Stack	SPA/ SSSI/ NCR	3.3	Gannet Colony

STRATEGIC ASSESSMENT OF THE ORKNEY ISLANDS LOCAL TRANSPORT STRATEGY (2007-2010)

APPENDIX : B.2 UK Priority Habitats and Species

**Habitat Action Plans**

Broad Habitat	UK Priority Habitats	Local Priority Habitats	Other occurring habitats
Broadleaved Mixed and Yew Woodland	<b>Upland birchwood</b>	Willow scrub  Broad-leaved plantation and policy woodland	
Coniferous Woodland			Conifer plantation
Boundary and Linear Features		Miscellaneous field boundaries Road verges	Hedges  Stone and earth boundary features
Arable and Horticulture	<b>Cereal field margins</b>	Arable crops	
Improved Grassland		Extensive hay/silage crops	Improved grassland
Neutral Grassland		Wet meadow Species-rich grassland	Semi-natural grassland
Dwarf Shrub Heath	<b>Upland heath</b>	Lowland heath Treeless woodland and dales  Maritime heath Empetrum heath Lichen heath Species-rich heath	
Fen, Marsh and Swamp	<b>Fens Reedbeds</b>	Marsh Base-rich flush Base-rich fen	
Bog	<b>Blanket bog</b>	Basin bog	
Standing Open Water and Canals	<b>Eutrophic standing waters Mesotrophic standing waters</b>	Oligotrophic and Dystrophic Lochs Ponds and milldams	
Rivers and Streams		Burns and canalised burns	
Montane Habitats		Montane habitats	
Inland Rock		Inland rock	
Built Up Areas and Gardens		Built-up areas and gardens	
Supralittoral Rock	<b>Maritime cliff and slopes</b>	Maritime grassland	
Supralittoral Sediment	<b>Coastal sand dunes Machair Coastal vegetated shingle</b>	Links Aeolianite Coastal strandline	Storm beach
Littoral Sediment	<b>Coastal saltmarsh Mudflats Sheltered muddy gravels</b>		
Inshore Sublittoral Rock	<b>Tidal rapids Modiolus modiolus beds</b>		
Inshore Sublittoral Sediments	<b>Seagrass beds (<i>Zostera marina</i> and <i>Zostera angustifolia</i>) Maerl beds Saline lagoons Mud in deep water Serpulid reefs Sublittoral sands and gravel</b>	Inlets and enclosed and sheltered bays	



Offshore, Shelf and Oceanic  
Habitats

STRATEGIC ASSESSMENT OF THE ORKNEY ISLANDS LOCAL TRANSPORT STRATEGY (2007-2010)

APPENDIX : B.2 UK Priority Habitats and Species

SCIENTIFIC NAME	COMMON NAME	UKL	LOCAL CRITERIA
<b>VERTEBRATES</b>			
<b>Mammals</b>			
<i>Apodemus sylvaticus</i>	Wood mouse	*	*1
<i>Balaenoptera acutorostrata</i> (baleen whales group)	minke whale	P	*1
<i>Delphinus delphis</i> (small dolphins group)	common dolphin	P	*1
<i>Globicephala melas</i> (toothed whales group)	long-finned pilot whale	P	*1
<i>Grampus griseus</i> (small dolphins group)	Risso's dolphin	P	*1
<i>Halichoerus grypha</i>	grey seal	C	*3
<i>Lagenorhynchus acutus</i> (small dolphins group)	Atlantic white-sided dolphin	P	*1
<i>Lagenorhynchus albirostris</i> (small dolphins group)	white-beaked dolphin	P	*1
<i>Lepus europaeus</i>	brown hare	P	*3
<i>Lepus timidus</i>	mountain hare	C	*3
<i>Lutra lutra lutra</i>	European otter	P	*3
<i>Megaptera novaeangliae</i>	Humpback whale	P	*1
<i>Microtus arvalis orcadensis</i>	Orkney vole	*	*3
<i>Neomys fodiens</i>	water shrew	C	*3
<i>Orcinus orca</i> (toothed whales group)	killer whale	P	*3
<i>Phoca vitulina</i>	common seal	C	*3
<i>Phocoena phocoena</i>	harbour porpoise	P	*3
<i>Physeter catodon</i> (toothed whales group)	sperm whale	P	*3
<i>Pipistrellus pipistrellus</i>	pipistrelle bat	P	*3
<i>Sorex minutus</i>	pygmy shrew	C	*1
<b>Amphibians</b>			
<i>Bufo bufo</i>	common toad	C	*3
<b>Fishes</b>			
<i>Ammodytes tobianus</i>	sandeel [lance]	*	*1
<i>Cetorhinus maximus</i>	basking shark	P	*3
<i>Clupea harengus</i> (commercial marine fish group)	herring	*	*1
(Deep water fish group)		P	
<i>Lamna nasus</i>	porbeagle shark	C	*3
<i>Pomatoschistus minutus</i>	sand goby	C	
<i>Prionace glauca</i>	blue shark	C	*3
<i>Raja batis</i>	common skate	P	*1
<i>Raja clavata</i>	thornback ray	*	*1
<i>Raja naevus</i>	cuckoo ray	*	*1
<i>Salmo salar</i>	Atlantic salmon	C	*2
<i>Salmo trutta</i>	trout	*	*3
<i>Squalus acanthias</i>	spurdog [hoe or sea da']	*	*1
<b>Reptiles</b>			
<i>Dermodochelys coriacea</i> (marine turtles group)	leatherback turtle	P	*3
<b>Birds</b>			
<i>Accipiter nisus</i>	sparrowhawk	C	*1
<i>Acrocephalus schoenobaenus</i>	sedge warbler	C	*1
<i>Alauda arvensis</i>	skylark [laverock]	P	*3
<i>Alca torda</i>	razorbill [coulter-neb]	C	*1
<i>Anas acuta</i>	pintail	C	*3
<i>Anas clypeata</i>	shoveler	C	*3
<i>Anas crecca</i>	teal	C	*3
<i>Anas penelope</i>	wigeon	C	*1
<i>Anas platyrhynchos</i>	mallard [stock duck]	C	*2

Anas querquedula	garganey	*	*1
Anas strepera	gadwall	C	*1
Anser albifrons	white-fronted goose	C	*1
Anser anser	Greylag goose	*	*1
Anthus petrosus	rock pipit [taing sparrow]	C	*1
Anthus pratensis	meadow pipit [teeting, tit lark]	C	*1
Arenaria interpres	turnstone	C	*1
Asio flammeus	short-eared owl [cattieface]	C	*3
Asio otus	long-eared owl	C	
Aythya ferina	pochard	C	*1
Aythya fuligula	tufted duck	C	
Aythya marila	scaup	C	*1
Branta leucopsis	barnacle goose [horra goose, rood goose]	C	*3
Bucephala clangula	goldeneye [gowdie duck, kwink]	C	
Buteo buteo	buzzard	C	*1
Calidris alba	sanderling	C	*1
Calidris alpina	dunlin [plover page, boondie]	C	*1
Calidris maritima	purple sandpiper	C	*1
Carduelis cannabina	linnet [lintie]	P	*1
Carduelis chloris	greenfinch	C	*1
Carduelis flavirostris	twite [heather lintie]	C	*1
Cephus grylle	black guillemot [tystie]	C	*3
Charadrius hiaticula	ringed plover [sandico, sandlark]	C	*3
Circus cyaeus	hen harrier [catabelly]	C	*3
Clangula hyemalis	long-tailed duck [calloo]	C	*1
Coturnix coturnix	Quail	*	*1
Corvus corax	Raven	*	*3
Corvus monedula	Jackdaw	*	*1
Crex crex	corncrake	P	*3
Cygnus cygnus	whooper swan	C	*3
Cygnus olor	mute swan	C	*3
Delichon urbica	house martin	C	*1
Emberiza schoeniclus	reed bunting	P	*1
Falco columbarius	merlin	C	*1
Falco peregrinus	peregrine	C	*1
Falco tinnunculus	kestrel [moosie-haak, wind-cuffer]	C	*1
Fratercula arctica	puffin [tammie norie, pope, lyre]	C	*3
Fulmarus glacialis	fulmar [mallimack]	*	*1
Gallinago gallinago	snipe [horse-gowk, heather-bleater]	C	*3
Gavia arctica	black-throated diver	C	
Gavia immer	great northern diver [immer goose]	C	*1
Gavia stellata	red-throated diver [rain goose, loon]	C	*3
Haematopus ostralegus	oystercatcher [shalder, chaldro, skeldro]	*	*3
Hirundo rustica	swallow	C	*3
Hydrobates pelagicus	storm petrel [alamottie]	C	*1
Lagopus lagopus scoticus	Red Grouse	*	*1
Larus argentatus	herring gull [white-maa; skorie=juvenile]	C	*1
Larus canus	common gull [cullya, and as for herring gull]	*	*1
Larus fuscus	lesser black-backed gull [baakie, swart back]	C	*1
Larus marinus	great black-backed gull	*	*!
Limosa lapponica	bar-tailed godwit	C	
Limosa limosa	black-tailed godwit	C	*1
Melanitta fusca	velvet scoter	C	

Mergus serrator	red-breasted merganser [harle, sawbill]	C	*1
Miliaria calandra	corn bunting [skitter-broltie]	P	*3
Morus bassanus	gannet [solan goose]	C	*1
Motacilla alba	pieb wagtail [willie wagtail]	C	*1
Numenius arquata	curlew [whaup]	C	*3
Numenius phaeopus	whimbrel [summer whaup, titterel]	C	*1
Oceanodroma leucorhoa	Leach's petrel	C	
Oenanthe oenanthe	wheatear [chackie, stone-chat, stinkiebeul]	C	*1
Phalacrocorax aristotelis	shag [skarf, tappie whaesie]	C	*1
Phalacrocorax carbo	cormorant [scarf, hiblin]	C	*1
Phalaropus lobatus	red-necked phalarope	P	
Phylloscopus trochilus	willow warbler	C	
Plectrophenax nivalis	snow bunting [snow flake]	C	
Pluvialis apricaria	golden plover [pliver]	C	*1
Podiceps auritus	Slavonian grebe	C	*1
Porzana porzana	Spotted crake	*	*1
Prunella modularis	duncock	C	*1
Puffinus puffinus	Manx shearwater [lyre]	C	*1
Rallus aquaticus	water rail	C	*1
Regulus regulus	goldcrest	C	*1
Riparia riparia	sand martin	*	*1
Rissa tridactyla	kittiwake [kittick, wekko, feckie]	*	*1
Saxicola torquata	stonechat	C	*1
Somateria mollissima	eider [dunter]	C	*1
Stercorarius parasiticus	arctic skua [scootie allan]	C	*3
Stercorarius skua	great skua [bonxie]	C	*3
Sterna albifrons	little tern	*	*1
Sterna hirundo	common tern [pickie-terno, pickie]	C	*3
Sterna paradisaea	arctic tern [pickie terno, pickie]	C	*3
Sterna sandvicensis	Sandwich tern	C	*3
Tadorna tadorna	shelduck [sly goose, links goose]	C	*3
Tachybaptus ruficollis	little grebe	*	*1
Tringa totanus	redshank [watery pleeps]	C	*3
Turdus philomelos	song thrush [mavis]	P	*3
Uria aalge	guillemot [aak]	*	*3
Vanellus vanellus	lapwing [teeick]	C	*3

## INVERTEBRATES

### Ants

Myrmica ruginodis	a red ant	*	*1
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### Bees

Bombus distinguendus	great yellow bumblebee	P	*1
Bombus muscorum	heath carder	*	*1

### Wasps

Dolichovespula sylvestris	tree wasp	*	*1
Dolichovespula norvegicus	Norwegian wasp	*	*1
Paravespula vulgaris	common wasp	*	*1
Nematus stichi	a sawfly	*	*1

### Beetles

Acupalpus dorsalis	a ground beetle	*	*1
Agabus melanarius	a water beetle	*	*1
Agabus paludosus	a water beetle	*	*1
Apion ryei	a weevil	*	*1
Brychius elevatus	crawling water beetle	*	*1

Chaetarthria seminulum	a scavenger water beetle	*	*1
Choleva glauca	fungus beetle	*	*1
Chrysolina crassicornis	a leaf beetle	C	*1
Coelambus novemlineatus	a water beetle	*	*1
Hybius aenescens	a water beetle	*	*1
Hydraena britteni	a small water beetle	*	*1
H. gracilis	a water beetle	*	*1
Hydrophilus piceus	great silver water beetle	C	*1
Hydroporus longicornis	a water beetle	*	*1
Hydroporus melanarius	a water beetle	*	*1
Hydroporus obsoletus	a water beetle	*	*1
Hydroporus umbrosus	a water beetle	*	*1
Hydrothassa hannoveriana	a leaf beetle	*	*1
Notiophilis rufipes	a ground beetle	*	*1
Pelophila borealis	a ground beetle	*	*1
Potamonectes griseostriatus	a water beetle	*	*1
Rhagonycha elongata	a soldier beetle	*	*1
Stictonectes lepidus	a water beetle	*	*1
Trechus fulvus	a ground beetle	*	*1
Tropiphorus terricola	brown weevil	*	*1
<b>Butterflies</b>			
Argynnis aglaja scotica	dark green fritillary	*	*3
Coenonympha tulia	large heath	C	*3
Polyommatus icarus	common blue	*	*2
<b>Caddis flies</b>			
Ylodes reuteri	a caddis fly	*	*1
<b>Damselflies and Dragonflies</b>			
Aeshna juncea	common hawk	*	*3
Cordulegaster boltonii	golden-ringed dragonfly	*	*3
Enallagma cyathigerum	common blue damselfly	*	*3
Ischnura elegans	Blue-tailed Damselfly	*	*3
Libellula quadrimaculata	Four-spotted chaser	*	*3
Pyrrhosoma nymphula	large red damselfly	*	*3
Sympetrum danae	black darter	*	*3
<b>Mayflies</b>			
Baetis muticus	a mayfly	*	*1
Siphonurus lacustris	a mayfly	*	*1
<b>Flies</b>			
Aphrosylus raptor	a dolichopodid fly	*	*1
Delia caledonica	a fly	*	*1
Neoscia geniculata	a hoverfly	*	*1
Neoscia obliqua	a hoverfly	*	*1
Orthonevra geniculata	a hoverfly	*	*1
Platycheirus podagratus	a hoverfly	*	*1
Rhamphomyia morio	a fly	*	*1
Tipula limbata	a crane fly	*	*1
<b>Stoneflies</b>			
Dinocras cephalotes	a stonefly	*	*1
<b>Grasshoppers</b>			
Chorthippus parallelus	meadow grasshopper	*	*1
Omcestus viridulus	common green grasshopper	*	*1
Tetrix undulata	a grasshopper	*	*1
<b>Moths</b>			

Agrotis vestigialis	archer's dart	*	*1
Apamea zeta assimilis	northern arches	*	*1
Carsia sororiata anglica	Manchester treble-bar	*	*1
Entephria flavicinctata	yellow-ringed carpet	*	*1
Eudonia alpina		*	*1
Eupithecia venosata ochracea	netted pug	*	*1
Euxoa cursoria	Coast dart	*	*1
Diarsia mendica orkneyensis	ingrailed clay	*	*1
Dyscia fagaria	grey scalloped bar	*	*1
Parasemia plantaginis insularum	wood tiger	*	*1
Perizoma flavofasciata	Sandy Carpet	*	*1
Psyche casta		*	*1
Saturnia pavonia	emperor	*	*2
Thera cognata	chestnut-coloured carpet	*	*1
Thera juniperata orcadensis	juniper carpet	*	*1
Udea uliginosalis	a moth	*	*1
Xestia alpicola alpina	northern dart	P	*1
<b>Millepedes</b>			
Nanogona polydesmoides	a millepede	C	*1
<b>Spiders</b>			
Agyneta cauta	money spider	*	*1
Agyneta conigera	money spider	*	*1
Araeoncus crassiceps	money spider	*	*1
Araeoncus humilis		*	*1
Baryphma trifrons	money spider	*	*1
Bathyphantes approximatus	money spider	*	*1
Centromerus arcanus	money spider	*	*1
Clubiona comta		*	*1
Drepanotylus uncatus	money spider	*	*1
Erigone arctica	money spider	*	*1
Erigone capra		*	*1
Erigone longipalpis	money spider	*	*1
Halorates reprobus	money spider	*	*1
Hilaira excisa	money spider	*	*1
Hilaira frigida	money spider	*	*1
Hypselistes jacksoni		*	*1
Hilaira pervicax		*	*1
Hyposinga pygmaea		*	*1
Jacksonella falconeri		*	*1
Latithorax faustus	money spider	*	*1
Lepthyphantes minutus		*	*1
Lepthyphantes whymeri	money spider	*	*1
Leptorhopterus robustum	money spider	*	*1
Lophomma punctatum	money spider	*	*1
Mecynargus (Rhaebothorax) morulus	money spider	*	*1
Meioneta beata	money spider	*	*1
Meioneta nigripes		*	*1
Minyriolus pusillus	money spider	*	*1
Neon reticulatus	jumping spider	*	*1
Nesticus cellulanus	comb-footed cellar spider	*	*1
Ozyptila atomaria	crab spider	*	*1
Ozyptila trux	crab spider	*	*1
Pelecopsis nemoralis	money spider	*	*1

<i>Pirata piraticus</i>	a wolf spider	*	*1
<i>Poecilonea variegata</i>	money spider	*	*1
<i>Robertus arundineti</i>	comb-footed spider	*	*1
<i>Scotinotylus evansi</i>	money spider	*	*1
<i>Silometopus ambiguus</i>	money spider	*	*1
<i>Trichopterna thorelli</i>	money spider	*	*1
<i>Typhochrestus digitatus</i>	money spider	*	*1
<i>Walckeneria clavicornis</i>	money spider	*	*1
<i>Walckeneria dysderoides</i>	a spider	*	*1
<i>Walckeneria vigilax</i>	money spider	*	*1
<b>Pseudoscorpions</b>			
<i>Neobisium carinioides</i>		*	*1
<b>Worms &amp; Leeches</b>			
<i>Chaetopterus variopedatus</i>	a tube-dwelling polychaete	*	*1
<i>Hirudo medicinalis</i>	medicinal leech	P	*1
<i>Ophelia bicornis</i>	an estuarine polychaete	C	*1
<b>Molluscs</b>			
<i>Atrina fragilis</i>	fan mussel	P	*1
<i>Cerastoderma glaucum</i>	lagoonal cockle	*	*1
<i>Hydrobia neglecta</i>	a snail	C	*1
<i>Leiostyla anglica</i>	a snail	C	*1
<i>Lymnaea peregra</i>	a snail (near-involute form)	*	*1
<i>Margaritifera margaritifera</i>	a freshwater pearl mussel	P	*1
<i>Modiolus modiolus</i>	horse mussel	C	*1
<i>Mya arenaria</i>	sand gaper	*	*1
<i>Nucella lapillus</i>	dog whelk	C	*1
<i>Ostrea edulis</i>	native oyster	P	*1
<i>Theodoxus fluviatilis</i>	a snail	*	*1
<i>Vertigo lilljeborgi</i>	a terrestrial snail	C	*1
<b>Crustaceans</b>			
<i>Nephrops norvegicus</i>	Norway lobster	*	*1
<b>Sea Anaemones</b>			
<i>Scolanthus callimorphus</i>	worm anemone	C	*1
<b>Sea Urchins</b>			
<i>Strongylocentrotus droebachiensis</i>	northern sea-urchin	C	*1
<b>PLANTS</b>			
<b>Algae</b>			
<i>Cladophora sauteri</i>	a green alga	*	*1
<i>Fucus disticus</i>	a brown algae	*	*1
<i>Lithothamnion coralloides</i>	a red alga	C	*1
<i>Lithothamnion glaciale</i>	a red alga	*	*1
<i>Phymatolithon calcareum</i>	a red alga	C	*1
<b>Fungus</b>			
<i>Clavaria zollingeri</i>	a fairy club	C	*1
<i>Coprinus comatus</i>	shaggy ink cap	*	*1
<i>Hygrocybe calyptriformis</i>	pink meadow cap	P	*1
<i>Wawelia microspora</i>		*	*1
<i>Langermannia gigantea</i>	giant puffball	*	*1
<b>Lichens</b>			
<i>Alectoria sarmentosa vexillifera</i>	a lichen	*	*1
<i>Caloplaca cerinella</i>	a lichen	*	*1
<i>Catapyrenium cinereum</i>	a lichen	*	*1
<i>Cladonia fragilissima</i>	a lichen	*	*1

Lobaria pulmonaria	a lichen	*	*1
Lecidea confluens	a lichen	*	*1
Peltigera scabrosa	a lichen	*	*1
Psorotichia schaereri	a lichen	*	*1
Schaereria fuscocinerea	a lichen	*	*1
Stringula taylorii	a lichen	*	*1
Toninia lobulata	a lichen	*	*1
<b>Liverworts</b>			
Barbilophozia atlantica	a liverwort	*	*1
Calypogeia azurea	a liverwort	*	*1
Eremonotus myriocarpus	a liverwort	*	*1
Gymnomitrium crenulatum	a liverwort	C	*
Herbertus stramineus	a liverwort	C	*
Jungermannia subelliptica	a liverwort	*	*1
Leiocolea fitzgeraldiae	a liverwort	*	*1
Lepidozia pearsonii	a liverwort	C	*
Odontoschisma elongatum	a liverwort	*	*1
Plagiochila carringtonii	a liverwort	C	*1
Plagiochila spinulosa	a liverwort	C	*
Porella obtusata	a liverwort	*	*1
Riccia cavernosa	a liverwort	*	*1
<b>Mosses</b>			
Amblyodon dealbatus	a moss	*	*1
Brachythecium mildeanum	a moss	*	*1
Bryum weigelii	a moss	*	*1
Campylopus schimperi	a moss	*	*1
Campylopus subulatus	a moss	*	*1
Dicranella crispa	a moss	*	*1
Distichium inclinatum	a moss	*	*1
Dreplanocladus lycopodioides	a moss	*	*1
Leucobryum glaucum	a moss	*	*1
Orthothecium rufescens	a moss	*	*1
Philonotis seriata	a moss	*	*1
Sphagnum austinii	a moss	*	*1
Sanionia orthothecioides	a moss	*	*1
Sphagnum magellanicum	a moss	*	*1
<b>Stoneworts</b>			
Chara aspera	rough stonewort	*	*1
Chara baltica	Baltic stonewort	P	
Chara canescens	bearded stonewort	P	
Chara curta	lesser bearded stonewort	P	*1
Chara muscosa	mossy stonewort	P	
Chara rudis	rugged stonewort	*	*1
Tolypella glomerata	clustered stonewort	*	*1
Tolypella nidifica	bird's nest stonewort	P	*1
<b>Vascular Plants</b>			
Ajuga pyramidalis	pyramidal bugle	*	*1
Ammophila arenaria	marram	*	*1
Angelica archangelica	Angelica	*	*1
Arctostaphylos alpinus	alpine bearberry/ black blaeberry	*	*1
Arctostaphylos uva-ursi	bearberry	*	*1
Aster tripolium	sea aster	*	*1
<b>Avena fatua</b>	<b>wild oat</b>	<b>*</b>	<b>*1</b>



<i>Avena strigosa</i>	bristle oak, black oak	*	*1
<i>Betula pubescens</i>	downy birch	*	*1
<i>Bolboschoenus maritimus</i>	sea club-rush	*	*1
<i>Briza media</i>	quaking-grass	*	*1
<i>Callitriche hermaphroditica</i>	autumnal water-starwort	*	*1
<i>Caltha palustris</i>	marsh marigold/ king cup	*	*2
<i>Calystegia soldanella</i>	sea bindweed	*	*1
<i>Carex capillaris</i>	hair sedge	*	*1
<i>Carex diandra</i>	lesser tussock sedge	*	*1
<i>Carex flacca</i>	glaucous sedge	*	*1
<i>Carex maritima</i>	curved sedge	*	*1
<i>Carex riparia</i>	great pond-sedge	*	*1
<i>Carex riparia x rostrata</i>	hybrid sedge	*	*1
<i>Catabrosa aquatica</i>	whorl-grass	*	*1
<i>Catapodium marinum</i>	stiff sand grass	*	*1
<i>Centaurea cyanus</i>	cornflower	P	*1
<i>Chamaemelum nobile</i>	chamomile	*	*1
<i>Chrysanthemum segetum</i>	corn marigold	*	*1
<i>Cornus suecica</i>	dwarf cornel	*	*1
<i>Corylus avellana</i>	hazel	*	*1
<i>Dactylorhiza purpurella</i>	northern fen orchid	*	*2
<i>Dactylorhiza sp</i>	spotted orchids	*	*3
<i>Diphasiastrum alpinum</i>	alpine clubmoss	*	*1
<i>Draba incana</i>	hoary whitlowgrass	*	*1
<i>Drosera longifolia</i>	great sundew	*	*1
<i>Dryas octopetala</i>	mountain avens	*	*1
<i>Dryopteris aemula</i>	hay-scented buckler-fern	C	*1
<i>Dryopteris oreades</i>	mountain male-fern	*	*1
<i>Equisetum pratense</i>	shady horsetail	*	*1
<i>Eriophorum latifolium</i>	broad-leaved cottongrass	*	*1
<i>Erodium cicutarium</i>	common stork's bill	*	*1
<i>Eupatorium cannabinum</i>	hemp agrimony	*	*1
<i>Euphrasia atrovioleacea</i>	an eyebright	*	*1
<i>Euphrasia farhaidensis</i>	an eyebright	*	*1
<i>Euphrasia foulaensis</i>	an eyebright	*	*1
<i>Euphrasia heslop-harrisonii</i>	an eyebright	P	*1
<i>Euphrasia marshallii</i>	an eyebright	C	*1
<i>Euphrasia ostenfeldii</i>	an eyebright	*	*1
<i>Euphrasia rotundifolia</i>	an eyebright	P	*1
<i>Euphrasia (as yet unnamed)</i>	an eyebright	*	*1
<i>Festuca arenaria</i>	rush-leaved fescus	*	*1
<i>Fragaria vesca</i>	wild strawberry	*	*1
<i>Fritillaria meleagris</i>	snaked-head fritillary	*	*1
<i>Fumaria bastardii</i>	tall ramping fumitory	*	
<i>Fumaria capreolata</i>	white ramping fumitory	*	
<i>Fumaria densiflora</i>	dense flowered fumitory	*	*1
<i>Fumaria purpurea</i>	purple ramping fumitory	P	*3
<i>Galium sternerii</i>	limestone bedstraw	*	*1
<i>Gnaphalium sylvaticum</i>	heath cudweed	C	*1
<i>Goodyera repens</i>	creeping lady's-tresses	*	*1
<i>Hammarbya paludosa</i>	bog orchid	C	*1
<i>Hieracium orcadense</i>	hawkweed	*	*1
<i>Hierochloë odorata</i>	holy-grass	C	*1

Hymenophyllum wilsonii	Wilson's filmy-fern	C	*1
Isoetes lacustris	quillwort	*	*1
Jasione montana	sheeps' bit	*	*1
Juncus balticus	baltic rush	*	*1
Juniperis communis	Juniper	P	*1
Loiseleuria procumbens	trailing azalea	*	*1
Lupinus nootkatensis	nootka lupin	*	*1
Lychnis flos-cuculi	ragged robin	*	*2
Lycopodium annotinum	interrupted clubmoss	*	*1
Medicago sativa ssp. Falcata	sickle medick	*	*1
Melampyrum pratense	common cow-wheat	*	*1
Mertensia maritima	oyster plant	*	*3
Myrica gale	bog myrtle	*	*1
Ophioglossum azoricum	small adder's-tongue	*	*1
Orchis mascula	early purple orchid	*	*1
Orthilia secunda	serrated wintergreen	*	*1
Oxyria digyna	mountain sorrel	*	*1
Parnassia palustris	grass-of-parnassus	*	*1
Phegopteris connectilis	beech fern	*	*1
Pimpinella saxifrage	burnet-saxifrage	*	*1
Poa alpina	alpine meadow-grass	*	*1
Polygonum boreale	northern knotgrass	*	*1
Polystichum lonchitis	holly fern	*	*1
Populus tremula	aspen	*	*1
Potamogeton filiformis	slender pondweed	*	*1
Potamogeton friesii	flat-stalked pondweed	*	*1
Potamogeton lucens	shining pondweed	*	*1
Potamogeton praelongus	long-stalked pondweed	*	*1
Potamogeton pusillus	lesser pondweed	*	*1
Potamogeton x zizii	a hybrid pondweed	*	*1
Primula scotica	Scottish primrose	C	*3
Primula veris	cowslip	*	*1
Pseudorchis albida	small white orchid	*	*1
Pyrola rotundifolia ssp. rotundifolia	round-leaved wintergreen	*	*1
Ranunculus hederaceus	ivy-leaved water-crowfoot	C	*1
Rorippa islandica	northern yellow-cress	*	*1
Rubus chamaemorus	cloudberry	*	*1
Rubus septentrionalis	bramble	*	*1
Ruppia cirrhosa	spiral tasselweed	*	*1
Sagina subulata	awl-leaved pearlwort	*	*1
Salicornia europaea agg.	common glasswort	*	*1
Salix aurita	Eared willow	*	*1
Salix cinerea	grey willow	*	*1
Salix myrsinites	myrtle-leaved willow	*	*1
Salix phylicifolia	tea-leaved willow/ rice	*	*3
Salix phylicifolia x repens = x schraderiana	hybrid willow	*	*1
Samolus valerandi	brookweed	*	*1
Saussurea alpina	alpine saw-wort	*	*1
Saxifraga aizoides	yellow saxifrage	*	*1
Saxifraga oppositifolia	purple saxifrage	*	*1
Saxifraga stellaris	starry saxifrage	*	*1
Scandix pecten-veneris	shepherd's needle	P	*1
Schoenoplectus lacustris	bullrush	*	*1

Schoenoplectus tabernaemontani	glaucos bullrush	*	*1
Schoenus nigricans	black bog-rush	*	*1
Scutellaria galericulata	skull-cap	*	*1
Senecio sylvaticus	wood groundsel	*	*1
Silene acaulis	moss campion	*	*1
Sorbus aucuparia	rowan	*	*1
Stellaria holostea	greater stitchwort	*	*1
Taraxacum europphyllum	dandelion	*	*1
Taraxacum fulvicarpum	dandelion	*	*1
Taraxacum landmarkii	dandelion	*	*1
Taraxacum orcadense	dandelion	*	*1
Taraxacum rubellum	dandelion	*	*1
Taraxacum subnaevosum	dandelion	*	*1
Taraxacum tanylepis	dandelion	*	*1
Thalictrum alpinum	alpine meadow-rue	*	*1
Trientalis europaea	chickweed wintergreen	*	*1
Vaccinium uliginosum	bog blaeberry	*	*1
Viola tricolor ssp curtisii	heart's-ease pansy	*	*1
Zostera angustifolia	narrow-leaved eelgrass	*	*1
Zostera marina	eelgrass/ common grass-wrack	C	*1
<b>Invasive Aliens</b>			
	hedgehog		
	New Zealand flatworm		
	vine weevil		
Campylopus introflexus	a moss		

## **Key to Table 2:**

### **UKL: UK priority list**

P - Priority species

C - Species of Conservation concern

### **L Cri: Local Criteria:**

Species that are not on any UK list but are identified as being of local importance as identified by the following local criteria:

\*1 - suggested by local expert

\*2 - suggested by local community

\*3 - suggested by both

## APPENDIX B.3

### Listed Buildings and Scheduled Ancient Monuments in the Orkney Islands

#### 1. Listed Buildings

##### BIRSAY

**'A' Listed** - The Earl's Palace, Birsay

**'B' Listed** - Birsay Kirk (St. Magnus); Old Birsay Manse; Boardhouse Threshing Mill & Steadings; Old Barony Meal Mill, Boardhouse; New Barony Meal Mill, Boardhouse; Kirbister Farmhouse; Sabiston Meal Mill; St. Peter's Monastery, Brough of Birsay

**'C(S)' Listed** - Birsay Bridge; The Kitchener Memorial; Old Bea Farmhouse

##### EDAY

**'B' Listed** - Carrick House

##### EVIE and RENDALL

**'A' Listed** - Broch of Gurness, Aiker Ness

**'B' Listed** - Woodwick Doocot; Crook Farmhouse; Rendall Doocot; Breck Farmhouse & Steading; Langaskaill Garisay

##### FIRTH and SUNNYBRAE

**'B' Listed** - Old Firth Manse, Curister; Firth Meal Mill, Millquoy; Burness House; Binsgarth House

##### HARRAY and STENNESS

**'B' Listed** - The Click Mill, Millbrig Hillside; Harray Kirk (St. Michael's); Mill of Harray Conyar; Midhouse of Corrigal; Holodyke; Mill of Tormiston; Mill of Ireland

**'C(S)' Listed** - Stenness Kirk; Bridge of Waithe

##### HOLM and WIDFORD

**'A' Listed** - The Italian Chapel including Statue, Lamb Holm

**'B' Listed** - Graemeshall, including boundary walls, gatepiers & walled gardens; Greenwall House, including outbuildings & boundary walls; Hestakelday; Pentland View, Former U P Church Manse including walled garden & outbuilding; Storehouse, St Mary's Village; St Nicholas's Church, Former Holm Kirk including walled churchyard, gatepiers & outbuilding; The Pier, St Mary's Village

**'C(S)' Listed** - Eastbanks including outbuilding; Howa including Kiln; Little Millhouse; Netherbutton including boundary walls, gatepiers & outbuilding; Smithy Cottage including former smithy & boundary walls; Clairness Cottage & adjoining cottage including boundary walls & railings, St Mary's Village; Dunnet's Cottage, St Mary's Village; Former Temperance Hall, St Mary's Village; West End Cottage including boundary walls, St. Marys Village; Wideford Farmhouse

##### HOY and GRAEMSAY

**'A' Listed** - Hoy Sound High Lighthouse, Gramesay, including keepers' houses, boundary walls & gatepiers; Melsetter House; Rysa Lodge.

**'B' Listed** - Hoy Sound Low Lighthouse, Gramesay, including keepers' houses, boundary walls & gatepiers, Gramesay; Sandside Farmhouse including steading & slipway; Bu of Hoy including ancillary buildings & boundary walls; Burra House, Hoy, including boundary walls, gatepiers & ancillary range with kiln; East Linksness, Hoy, including ancillary buildings; Hoy Lodge including

kennels, boundary walls & gatepiers; Burnmouth, Rackwick, Hoy including boundary walls; Cantick Head Lighthouse; Moodie Burial Place, Kirkhope Burial Ground; Martello Tower, Hack Ness, Longhope; Ness House, Southness, South Walls; Snelsetter, Longhope

**‘C(S)’ Listed** - The Clett, including boundary walls & outbuildings, Gramesay; Gorn, Gramesay; Gramesay Kirk including graveyard; Quoys including outbuildings, Graemsay; Scarrataing, Gramesay; Newstead, Hoy including ancillary building; Orgil Farm, Hoy; Muckle House including ancillary building, Rackwick, Hoy; The Mount, Rackwick, Hoy; West End, Hoy

## **KIRKWALL**

**‘A’ Listed** - Bishop’s Palace (Palace Road and Watergate Street); 35 Broad Street; 37 Broad Street; 39 Broad Street; 41 Broad Street (The Orkney Museum) including garden walls; Earl’s Palace (Palace Road); St Magnus Cathedral, Cathedral Church of St Magnus the Martyr including boundary walls, railings, graveyard & war memorial

**‘B’ Listed** - 8 Albert Street (Former Commercial Bank); 20 Albert Street; 33 Albert Street; 34 Albert Street; 43 Albert Street (I) (Patrick Traills House); 43 Albert Street (II); 56 Albert Street (Bank of Scotland); 60 Albert Street; Alton House, Berstane Road, including boundary walls; Ayre Hotel, Harbour Street; 7 Bridge Street; 13 Bridge Street; 15 & 17 Bridge Street; 21 & 23 Bridge Street; 31 & 33 Bridge Street; 20 & 22 Bridge Street; 24 Bridge Street, including Arch from St Olaf’s Church; 2 Broad Street; 4 Broad Street; 5 Broad Street (Formerly Provost Riddoch’s House) including boundary walls, gatepiers & railings; 6 Broad Street (Orkney Tourist Board); 8 Broad Street; 32 Broad Street; 36 Broad Street (Former Grammar School); 8 Clay Loan, including building attached to rear; 12 Clay Loan; 54 Clay Loan, including boundary walls & railings; Colwyn, Watergate Street & Victoria Road; Council Offices, School Place; 1- 9 (odd nos.) Cromwell Road; Daisybank House, including boundary walls & gatepiers, East Road; 18 East Road, including boundary walls; Former Fish Processing Plant, Harbour Street; Former Storehouse, Queen Street & Bridge Street Wynd; Garmisgarth, including boundary walls, Mill Street; Grainbank House, Ayre Road; 2- 8 (even nos.) Gunns Close; 20 Harbour Street (The Girnle Keeper’s House); 22 Harbour Street (The Girnle House); Highland Park Distillery, Holm Road; 12 High Street; 2 King Street including boundary walls & gatepiers; 6 & 8 King Street, including ancillary building, boundary walls & railings; 9 King Street, including ancillary building, boundary walls, gatepiers & railings; 10 King Street including boundary walls; Kirkwall Harbour; Kirkwall Hotel, Harbour Street; Kirkwall Public Library, Laing Street; 3 Main Street; 5 Main Street; 14 Main Street, including railings (West End Hotel); 23 Main Street; 25 Main Street; 28, 28a and 28b Main Street; 6 Nicolson Street, including boundary walls; 8 Old Scapa Road, including boundary walls, railings & doocot; 1 Palace Road; Papdale House, Berstane Road; Papdale House walled garden including Doocot, Berstane Road; Paterson/East Church, School Place; 12 & 14 Queen Street, including boundary walls; 9-12 St Catherine’s Place; 13 & 14 St Catherine’s Place; 15-18 St Catherine’s Place; 19 & 20 St Catherine’s Place; 21 & 22 St Catherine’s Place, including ancillary buildings; 23 St Catherine’s Place, including ancillary buildings; 24 St Catherine’s Place; 25 & 26 St Catherine’s Place, including ancillary buildings; St Olafs Church (Episcopalian) including boundary walls, gatepiers & railings, Dundas Crescent; 5 School Place, including boundary walls; Sheriff Court & Police Station, including boundary walls, gatepiers and railings; 16 & 18 Shore Street (John Pottinger’s House); 22 Shore Street (Tounigar); 1-6 The Strynd; Strynd Tearooms, The Strynd; Strynd Walls, including storehouse, North Side; Summerhouse rear of Bridge Street; Town Hall, Broad Street; 6 Union Street; 12 & 14 Victoria Street; 19-23 (odd nos) Victoria Street; 22-26 (even nos) Victoria Street; 25 Victoria Street; 27 Victoria Street; 29 Victoria Street; 37 and 39 Victoria Street; 51 Victoria Street; 54 & 56 Victoria Street; 60 Victoria Street; 61 Victoria Street; 62 & 64 Victoria Street; 72 Victoria Street (Spence’s Square); 74 Victoria Street (Spence’s Square); 79 & 81 Victoria Street; 83 Victoria Street; 86 Victoria Street; 87 Victoria Street; 91 Victoria Street, including boundary walls; 6 Watergate Street (The Old Manse); 2 and 4 Wellington Street, including ancillary building & boundary walls; 6 and 8 Wellington Street; 12 Wellington Street,

including boundary walls; 14 Wellington Street; 16 & 18 Wellington Street; 30 Wellington Street & 34 Wellington Street

**‘C(S)’ Listed** - 9 Albert Square (rear of Mounthoolie Place) including boundary walls & railings; 6 Albert Street, including boundary walls; 9 & 11 Albert Street; 27 & 29 Albert Street; 31 Albert Street; 35 Albert Street; 41 Albert Street, including boundary walls; 42 Albert Street; 45 & 47 Albert Street; 52 & 54 Albert Street; 59 Albert Street; 63 & 65 Albert Street; 67 & 69 Albert Street; Bignold Park Pavilion; 1 Bridge Street; 2 Bridge Street; 11 Bridge Street; 19 Bridge Street; 26 Bridge Street; 17,19 & 21 Broad Street; 10 Clay Loan; 18 & 20 Clay Loan; Drinking Fountain, St Magnus Cathedral Green; Eastbank House, East Road; 6 & 8 Dundas Crescent including boundary walls, gatepiers & railings; 5 East Road, including boundary walls & railings; 9 & 11 East Road; 13 East Road, including boundary walls; 17 East Road, including boundary walls & railings; 19 & 21 East Road, including boundary walls & railings; 20- 26 (even nos) East Road; Former Ayre Mills, Ayre Road; Glaitness House, Glaitness Road; 2 High Street; 6 High Street; 18 High Street; 20 High Street; 22 High Street; 24 High Street; 30 High Street, including boundary walls; 1 Junction Road (The Orkney Wireless Museum); King Street Church (Church of Scotland) including boundary walls; Kirkwall Baptist Church, Victoria Street, including hall & boundary walls; Kirkwall Bowling Green (Bowling Pavilion); 10 Laing Street; Lilybank House, East Road; Madras Villa, Bignold Park Road; 8 Main Street; 10 Main Street; 22 Main Street; 24 Main Street; 1 Nicolson Street, including boundary walls & gatepiers; 7 Nicolson Street, including boundary walls; 8 St Olafs Wynd; 10 St Olafs Wynd; 6 Old Scapa Road, including boundary walls & gatepiers; 3-9 (odd nos) Palace Road; Park Cottage, Berstane Road; 1 School Place; 3 School Place, including boundary walls; 6 School Place; 8 School Place; 10 School Place; 11 School Place; 12 School Place; 2 Shore Street; 1 Victoria Street (Royal Bank of Scotland); 7 Victoria Street, including courtyard walls & railings; 33 Victoria Street; 35 Victoria Street; 41 Victoria Street; 47 & 49 Victoria Street; 59 Victoria Street; 58 Victoria Street; 66 Victoria Street; 66a Victoria Street; 66b Victoria Street; 76 Victoria Street; 78 Victoria Street; 80 Victoria Street; Vorsheed, Berstane Road, including ancillary structures, boundary walls & gatepiers; 5 Walls Close, including boundary walls; 3 Wellington Street, including ancillary building and boundary walls; 26 Wellington Street.

#### **NORTH RONALDSAY**

**‘A’ Listed** - Dennis Head Beacon including remains of keepers house; North Ronaldsay Sheep Dyke and associated ponds.

**‘B’ Listed** - Gateside including outbuildings; Nether Linnay; New Church (former UF Church); Old Kirk including boundary walls & gatepiers; Peckhole Mill; Peckhole Windmill; Rue including outbuildings & boundary walls; Verracott; North Ronaldsay Lighthouse including keepers’ houses, boundary walls & foghorn

**‘C(S)’ Listed** - Barren Ha; Dennis Head Fishing Station and Pier; Holland House including outbuildings garden walls, steading & cottages; Holland House steading, factor’s house & bothy; Hooking Watermill; Lurand including boundary walls & outbuilding; Linklet House including outbuildings, boundary walls & gatepiers; Nouster; Sandback

#### **ORPHIR and SCAPA**

**‘A’ Listed** - St. Nicholas’ Chapel and the Earl’s Bu; Hall of Clestrian

**‘B’ Listed** - Kirbister Meal Mill; Old Orphir School, Kirbister; Swanbister House.

**‘C(S)’ Listed** - Hobbister House; Orphir House (Hall of Gyre); Grindally House; Howth Farmhouse; Quoy of Howton

#### **PAPA WESTRAY**

**‘B’ Listed** - Old Papa Westray Kirk (St. Boniface’s); Holland House; Holland Doocot; Nouster Stores.

## **ROUSAY**

**'A' Listed** - Mid Howe Broch, Outer Westness; St. Magnus Church (Old Egilsay Kirk).

**'B' Listed** - Westness House, Inner Westness; Trumland House; Rousay Meal Mill Sourin; Howan House, Egilsay, including remains of service court; Old Wyre Kirk (St. Peters); Cubbie Roo's Castle; Monastery, Eynhallow; Viera Lodge, including outbuildings, boathouse, gate piers & boundary walls.

## **SANDAY**

**'B' Listed** - Backaskaill Mains; Boloquoy Farm including boundary walls, ancillary buildings, meal mill & farm cottages; Kettletoft Pier, including slipway; Marygarth Manse with ancillary buildings including drying kiln, boundary walls & gatepiers; Quivals Farmhouse (Former School) including boundary wall & ancillary buildings; Burness Saville Farmhouse including ancillary buildings; Scar House, Westove, including ancillary range with mill & Doocot, walled garden & farm cottages; Scar former Water Mill, Westove; Scar former windmill, Westove; Stove Farmhouse & Farm Cottages; Warsetter Farm, Cross, including boundary walls, gatepiers & ancillary farm courtyard with threshing barn; Warsetter Farm Cottages, Cross; Warsetter Farm Doocot, Cross.

## **SANDWICK**

**'A' Listed** - Sandwick Kirk (St. Peter's); Skaill House.

**'B' Listed** - Skaill Doocot; West Aith

**'C(S)' Listed** - Mill of Rango; Nether Benziecllett

## **SHAPINSAY**

**'A' Listed** - Balfour Castle (with garden gateway)

**'B' Listed** - Shapinsay Kirk (South Church); Balfour Burial Aisle (South Churchyard); Shapinsay Meal Mill, Ellwick; Balfour Castle, Doocot; Stone Lodge (Gate Lodge), Balfour Castle; Shapinsay Lighthouse; 10 Balfour Village; The Smithy, Balfour Village; 23 & 24 Balfour Village.

**'C(S)' Listed** - Gate Piers, Balfour Castle; 2 Balfour Village; 3 & 4 Balfour Village; 5 Balfour Village; 6 Balfour Village; 7 & 8 Balfour Village; 9 Balfour Village; 12- 22 (consecutive) Balfour Village.

## **SOUTH RONALDSAY AND BURRAY**

**'A' Listed** - Pentland Skerries Lighthouses

**'B' Listed** - South Kirk (St. Mary's) & Kirkyard Gateway; Sandwick House (New House); Kirkhouse Meal Mill, Widewall; North Kirk (St. Peter's); Swanson House, Front Road St. Margaret's Hope; 'Lairdene', Front Road, St. Margaret's Hope; St. Margaret's Hoose (Creel), Front Road, St. Margaret's Hope; Garden Gate, Smiddy Bank, St. Margaret's Hope; Old Burray Kirk (St. Lawrence's); Bow Farmhouse (The Bu of Burray); Tomison's Academy; Burwick Farm, including ancillary buildings; South Ronaldsay Smithy, South Parish; Store House, Westshore.

**'C(S)' Listed** - Cara Mill; Corner House (The Anchorage), Front Road, St. Margaret's Hope.

## **ST ANDREWS AND DEERNESS**

**'B' Listed** - Copinsay Lighthouse, including foghorn & keeper's houses; Covenanter's Memorial; Derbyshire; Hall of Tankerness, including boundary walls & gatepiers; Hall of Tankerness Steading, including farmhouse, barn & smithy; Mirkaday Fishing Station, Mirkaday Point; North House; Old St Andrews Manse, including boundary wall, ancillary building & cottage; Sebay Meal Mill; St Andrews Burial Ground, including Baikie Burial Vault, Hall of Tankerness; St Ninians Church (Church of Scotland) Skaill including walled churchyard & railings; Tankerness Fishing Station, including curing house, salt warehouse, bothy & pier; Tankerness Meal Mill, including boundary wall & lade; Scarpigar Farm Buildings, Yinstay

**‘C(S)’ Listed** – Braebuster, including farmhouse, boundary walls, gatepiers, steading, kiln & cottages; Canniemyre; Cellardyke, including dwelling house & barn; Braebuster including farmhouse, boundary walls, gatepiers, steading, kiln & cottages; Former School, including boundary walls & lavatory block; Midhouse, including barn; Mirkaday Steading, including farmhouse & horse mill; Quoypettie, including ancillary structures; Sebay Farmhouse, including boundary wall & steading; St Andrews Kirk (North Church, Church of Scotland); Linkness, The Ness, including threshing barn & wind powered water pump; Berstane Doocot.

## **STROMNESS**

**‘A’ Listed** - Sule Skerry Lighthouse

**‘B’ Listed** - 53 and 55 Alfred Street, including garden wall & gates; 69 Alfred Street, 2 Alfred Street (The Haven); 38, 40 & 46 Alfred Street, including slipway, quays & boat derricks; 50- 56 (even nos) Alfred Street including The Stromness Museum; Citadel Farmhouse, including outbuildings; 23 & 25 Dundas Street; 27 Dundas Street, including walled garden & outbuilding; 78 Dundas Street, including outbuilding & former quay; 90 Dundas Street; Garson Farm, including farm outbuildings & horse mill; Garson House; 1- 5 (odd nos) Graham Place; 41 Graham Place; 5 Hellihole Road (Melvin House) including boundary wall incorporating outbuilding; 13 John Street (The Miller’s House); 36-42 John Street (even nos), (The Lieutenants House, Speedings including walled garden); 1 Manse Lane, 3 Manse Lane, including outbuilding & walled garden; 1, 3 & 5 Melvin Place; 2 Melvin Place, including boundary walls, gatepiers & railings; 4 Melvin Place; 6 Melvin Place; 2 - 12 Ness Road (The Double Houses) including quay & walled garden; Stenigar, Ness Road, including boundary walls & outbuildings; 3 South End; 5 South End; Stromness Parish Church, Victoria Street, (Church of Scotland) including church hall, gatepiers; Stromness Hotel, Victoria Street, including walled garden; 69-73 Victoria Street (formerly The Commercial Hotel) including outbuilding; 97 Victoria Street (The Bank of Scotland); 8 Victoria Street (Orkney Tourist Office); 28 Victoria Street (The Pier Art’s Centre) including quay; 102 Victoria Street, including boundary walls, gatepiers & railings; 112 Victoria Street, including gig house & quay; 116 Victoria Street; 118 Victoria Street; 134 Victoria Street, including quay & slipway; White House, Whitehouse Lane, including outbuildings to rear

**‘C(S)’ Listed** - Alexander Graham Fountain, Victoria Street; 5 & 7 Alfred Street; 8 Alfred Street, including gatepier; 9 Alfred Street; 10 Alfred Street; 14 Alfred Street; 15 & 17 Alfred Street, including boundary walls, gatepiers & railings; 16 Alfred Street; 20 Alfred Street; 22 & 24 Alfred Street, including outbuilding; 30-32 Alfred Street (Former Shellfish Processing Depot) including slipway; 42 Alfred Street; 44 Alfred Street; 49 & 51 Alfred Street; 57 & 59 Alfred Street; 61 Alfred Street; 65 Alfred Street; The Bothy, Sutherland’s Pier, including common quay, Victoria Street; 3, 4 & 5 Alfred Terrace; Breckness House; 5 Church Road; 17 Church Road; 19 Church Road; 1 & 5 Dundas Street; 2 & 4 Dundas Street, including outbuilding, slipway & quay; 13 & 15 Dundas Street; 17, 19 & 19a Dundas Street; 34 Dundas Street, including quay & slipway; 36 & 38 Dundas Street; 40 Dundas Street, including walled garden; 46 & 48 Dundas Street, including boundary wall & slipway; 84 & 86 Dundas Street; Fishing Store, Ness Road; 1 Franklin Road, including boundary wall with entrance, & outbuilding; 3 Franklin Road, including boundary walls, gateway & garden railings; 8 Franklin Road & 4 Manse Road, including boundary wall & outbuilding; 12 Franklin Road; 14- 20 (even nos) Franklin Road; Garth Farm, North Breck, including ancillary structure & remnants of walled garden; 7 Graham Place; 8 & 10 Graham Place (Lyness House) including boundary walls; 12 & 14 Graham Place; 15 Graham Place (Alquist) including walled garden & outbuilding; 20 & 22 Graham Place, including boundary wall & outbuilding; 25 Graham Place; 33 & 35 Graham Place (The Hamnavoe Restaurant); 39 Graham Place; 43 Graham Place (Ardenlea); 49 Graham Place; 16 Harbour Street (The Harbour Office); 2 Hellihole Road (Stromness Public Library); 4 Hellihole Road, including outbuildings; 5 Hillside Road, including boundary walls & railings; 17 & 18 Hillside Road (Sunnybank, including outbuilding & boundary wall); 24 & 26 John Street, 30 John Street; 45 & 47 John Street; 55 John Street; 59, 61 & 63 John Street; 87 John Street, including outbuilding & walled garden; 3 Khyber Pass; 4 Khyber Pass; 5 Khyber Pass; 6 Khyber Pass, including outbuilding &



shared walled garden; Lingmira Farm, Outertown Road, mill); Little Arion, including gatepiers, boundary walls & ancillary structures; 5 Manse Lane (The Manse) including boundary walls, gateway & outbuilding; Millhouse, Kirkwall Road, including ancillary structures & boundary walls; 1 Ness Road, including boundary walls & gatepiers; 15 Ness Road (Former Sule Skerry Lighthouse) including boundary walls & gatepiers; 8 North End Road; 22 North End Road, including railings, gatepiers, outbuildings & walled garden; 34 North End Road; Old North Manse (Vagaland) including boundary walls, gatepiers & gates, Back Road; Ogalby, Outertown Road, including gatepiers & boundary walls; Quildon Cottage, Back Road, including former kiln; 2 South End, including quay; 7 South End; 10 & 12 South End, including slipway & quay; 19- 25 (odd nos) South End; Stackaldbrae; Town Hall, Church Road (Former North Kirk) including outbuilding, boundary walls & railings; Victoria House, Back Road, including boundary walls & railings; 1 & 3 Victoria Street (The Royal Bank of Scotland) including boundary walls; 5 Victoria Street (Former Masonic Lodge) including railings; 11 Victoria Street (The Town House) including boundary walls, gatepiers & railings; 18 & 20 Victoria Street (The Eventide Club & Registrar's Office respectively); 30 Victoria Street (Entrance to the Pier Art's Centre); 49 and 51 Victoria Street, including walled garden; 51 Victoria Street; 68 & 70 Victoria Street, including quay; 78- 86 Victoria Street (even nos) including quay & slipway; 79- 91 (odd nos) Victoria Street; 103, 105 & 107 Victoria Street; 108 Victoria Street; 108a Victoria Street, including quay & slipway; 109 Victoria Street; 110 Victoria Street; 111 Victoria Street; 113 Victoria Street; 122 Victoria Street (Seahaven); 124 Victoria Street; 126 Victoria Street & 132 Victoria Street, including quay and slipway

## **STRONSAY**

**'B' Listed** - Stronsay Meal Mill, Lower Millfield; Lower Millfield Farm, including outbuildings & boundary walls; Papa Stronsay House; Auskerry Lighthouse.

## **WALLS & FLOTTA**

**'A' Listed** – Chapel, Melsetter House, Walls, Hoy; Melsetter House, including garden walls & former kennels, Walls, Hoy; Kitchen garden, including tea house and Doocot, rookery walls, and gatepier, Melsetter House, Walls, Hoy; Rysa Lodge, including garden wall to S&E & outbuildings to SE, Hoy

**'B' Listed** – Cantick Head Lighthouse including Keepers Cottages, sheds, perimeter wall and sundial, South Walls, Hoy; Old Custom House including Westburn, including boundary wall, Longhope, South Walls, Hoy; Snelsletter, South Walls, Hoy; Ness House, South Ness, South Walls, Hoy; Lifeboat Station, Longhope, Walls, Hoy; The Estate Office, including boundary wall and adjacent outhouse, and stone flagged yard and gatepiers to west, Melsetter, Walls, Hoy; gardeners cottage including stone setts and garden wall to north, Melsetter, Walls, Hoy; The Hall, including gatepiers to west, Melsetter, Walls, Hoy; The Laundry House, including walled yard to north and walls and gatepiers to SE, Melsetter, Walls, Hoy; Spinning Cottage, Melsetter, Walls, Hoy; Walled garden, formerly rose garden, NW of Melsetter House including cartshed to west, Melsetter, Walls, Hoy; Muckle Rysa including gate wall, Walls, Hoy; Munitions Depot, SW of Ore Farm, Walls, Hoy; Bridge SE of Pegal Hill, Walls, Hoy; Wee Fea Naval Communications and Operational Centre, Walls, Hoy; Moodie Mausoleum and Graveyard, Osmondwall, South Walls, Hoy.

**'C' Listed** – Bow Old Farmhouse, byre & barn, Flotta; Flotta Church including War Memorial, Flotta; Whome Kiln & Barn, Flotta; Pigsty, Crowtaing, South Walls, Hoy; Milestone N of Gallow Taug, South Walls, Hoy; Letterbox, Kirbuster, South Walls, Hoy; Glebelands including walled garden and boundary wall, South Walls, Hoy; Hillside, South Walls, Hoy; Milestone S of Kirbuster House, South Walls, Hoy; Church of Columba, Longhope, South Walls, Hoy; Milestone NE of Morven, Longhope, South Walls, Hoy; Royal Hotel including boundary wall, Longhope, South Walls, Hoy; Milestone, Lythes, South Walls, Hoy; Quoy, South Walls, Hoy; Snelsletter gatepiers, South Walls, Hoy; War Memorial, South Ness, South Walls, Hoy; The Garrison, Walls, Hoy; Naval Cemetery including pavilions, War Memorial and boundary walls, Lyness, Walls, Hoy; Lyness Pier, Walls, Hoy; Decontamination shed, Lyness, Walls, Hoy; Milestone W of Haybrake, Lyness, Walls, Hoy; Romney

Hut, Lyness, Walls, Hoy; Milestone W of Lywara Bay, Walls, Hoy; Melsetter Farmhouse including boundry walls, Walls, Hoy; steading, Melsetter Farm, Walls, Hoy; Lodge Gates, gatepiers and field boundary walls and gatepiers, Melsetter House, Walls, Hoy; Burial Enclosure, Melsetter Hill, Walls, Hoy; Millhouse, Walls, Hoy; Milestone N of Millhouse, Walls, Hoy; 1 North Ness, Walls, Hoy; Milestone, North Ness, Walls, Hoy; Milestone to E of Pegal Hill, Walls, Hoy; St John's Church including boundary walls, Walls, Hoy.

## **WESTRAY**

**'A' Listed** - Noltland Castle

**'B' Listed** - Cleat Farmhouse & Farm; Cleat Doocot; Cross Kirk (Holy Cross Chapel), Westside; Old Cross Manse, Langskaill; Brough House, Braehead; Trenabie Mills, Peirowall; Noup Head Lighthouse; Lady Kirk (St. Mary's), Pierowall.

**'C(S)' Listed** - Brough Home Farm

## 2. Scheduled Ancient Monuments

### BIRSAY

SCHEDULED MONUMENTS		
1244	Black Knowe : mound	HY 286245
90034	Brough of Birsay : St Peters Church & settlement'	HY 239285
1259	Durka Dale : burnt mound	HY 299250
90033	Earls Palace', Birsay	HY 248277
1262	Esgar : two burnt mounds	HY 295211
1268	Gairsty : cairn	HY 234227
1270	Green Knowe : burnt mound	HY 285247
1397	Hillhead : three mounds	HY 257277
1319	Hundland : cairn	HY 299267
1318	Hundland : cairn	HY 299268
1284	Hundland : mound	HY 297263
1285	Kirbuster Hill : mounds	HY 284264
1289	Knowe of Brenda : burnt mound	HY 266238
1292	Knowe of Crustan : mound	HY 274289
1294	Knowe of Dale : burnt mound	HY 249243
1295	Knowe of Eversti : burnt mound	HY 230229
1296	Knowe of Flaws : burnt mound	HY 231243
1297	Knowe of Garraquoy : burnt mound	HY 237237
1302	Knowe of Makerhouse : burnt mound	HY 293211
1304	Knowe of Nesthouse, settlement	HY 279256
1305	Knowe of Netherskaill : burnt mound	HY 234242
1458	Knowe of Skogar : broch	HY 264234
1308	Knowe of Skorn : mound	HY 249238
1309	Knowe of Smirrus : mound	HY 291215
1312	Knowes of Cuean : mounds	HY 303228
1314	Knowes of Lingro : mounds	HY 284290
1372	Loch of Sabiston : island structure	HY 293219
2934	Marwick : chapel & burial ground	HY 230241
2884	Marwick : Viking houses	HY 228239
1350	Mittens : two mounds	HY 296282
1354	Mount Misery : mound, Boardhouse Farm	HY 245273
1444	Oxtro or Oxta, broch, Boardhouse	HY 253267
1362	Park Holm : artificial island and causeway	HY 312269
1290	Point of Buckquoy : five mounds	HY 244282
1405	Queena : two mounds	HY 277278
1357	Queena Fjold : mounds	HY 267251
1402	Quoyhorrie : two mounds	HY 284270
1368	Raviehall : three mounds	HY 259249
1403	Runa : mound	HY 265244
1373	Saevar Howe : mound	HY 246270
1389	Stanerandy : mound & two standing stones	HY 267276
1394	Stoney Holm : crannog	HY 311273
1400	Summmerfield : three mounds	HY 276228
1414	Wheebin : standing stone	HY 252262

**EDAY**

<b>SCHEDULED MONUMENTS</b>		
1241	Bay of London : mound	HY 557348
1356	Burn of Mussetter : standing stone	HY 555329
1249	Calf of Eday : chambered cairns	HY 579385
1250	Carrick : chambered cairn	HY 562377
1251	Carrick Farm : chambered cairn	HY 563375
1432	Carrick House : chambered cairn	HY 563388
1252	Chapel Hill : chambered cairn by ruined kirk	HY 560324
1257	Dale : burnt mound	HY 529331
1258	Doomy : chambered cairn	HY 556345
1261	Eday Church Hall: chambered cairn	HY 560334
1441	Fold of Setter : enclosure	HY 564374
1287	Knoll of Merrigarth : burnt mound & mound	HY 552288
1321	Mill Hill Chambered cairn	HY 567353
1355	Muckle Hill or Linkataing : chambered	HY 553393
1440	Quoy : broch	HY 527380
1471	Resting Hill : chambered cairn	HY 561368
1375	Sandhill : burnt mound	HY 565329
3535	Sandhill : chambered cairn	HY 561329
1381	Southside : standing stone	HY 561292
5944	Stackel Brae, castle, Maltbarn, Eday	HY 564288
4299	"Stone of Setter : standing stone	HY 564371
1410	Vinquoy Hill : chambered cairn	HY 560381

**EVIE & RENDALL**

<b>SCHEDULED MONUMENTS</b>		
90157	Aikerness : Broch of Gurness	HY 3832682
1245	Black Knowe : mound	HY 369198
1426	Burgar : broch	HY 352276
1247	Burgar : chambered cairn	HY 348278
1485	Hall of Rendall: St Thomas Kirk	HY 424210
1420	Hall of Rendall : broch	HY 424209
1280	Howana Gruna : cairn	HY 336263
1453	Knowe of Dishero or Discrow : broch	HY 425199
1454	Knowe of Grugar or Ryo : broch	HY 356272
1343	Knowe of Lyron : mound	HY 386196
1303	Knowe of Midgarth : settlement & cairn	HY 398235
1459	Knowe Stenso : broch	HY 363267
1313	Knowes of Euro : mounds	HY 413188
2181	Langskaill, Viking Houses	HY 434220
1415	Midland : mound	HY 397235
1465	Mithouse : souterrain	HY 323290
1442	Ness of Boray : broch	HY 442210

1467	Ness of Woodwick : broch	HY 400248
1360	Northwald : mounds & burnt mound	HY 390180
1483	Peters Kirk, church, burial ground and broch	HY 337286
1369	Reeky Knowes : mounds	HY 387265
1371	Robies Knowe : burnt mound	HY 362266
1376	Sandyhall : mounds	HY 399193
1378	Seven Knowes : mounds	HY 393207
1340	Skelbust : chambered cairn	HY 449223
1486	South Ettit : church	HY 424197
1395	Sweyns Castle : burnt mound	HY 450219
1473	Thing Woll : broch	HY 401228
1408	Varme Dale : mounds	HY 406187
1474	Verron, broch 640m NW of Upper Midhouse	HY 319298
1477	Vinquin : broch	HY 327283
1412	Wass Wick : mound	HY 412219
1413	West Puldrite : two mounds	HY 414186

#### **FIRTH AND SUNNYBRAE**

<b>SCHEDULED MONUMENTS</b>		
1253	Burness : broch & chapel	HY 388156
90092	Cuween Hill : chambered cairn	HY 364128
2949	Damsay : St Marys Chapel	HY 389142
1281	Howe Harper : cairn	HY 345143
1450	Ingashowe : broch	HY 390127
1365	Quanterness, chambered carin and prehistoric house	HY 417129
90245	Rennibister : souterrain	HY 397127
1404	Setter : two mounds	HY 345154
1396	Syra Dale : two cairns	HY 346157
1448	The Hillock : broch	HY 361141
90315	Wideford Hill : chambered cairn	HY 409121

#### **GRAMESAY, HOY & FLOTTA**

<b>SCHEDULED MONUMENTS</b>		
3253	Buchanan Battery	ND 374933
2726	Crockness : Martello Tower	ND 324934
90122	Dwarfie Stane	HY 244005
1422	Green Hill of Hesti Geo : broch	ND 336890
90211	Hackness : Martello Tower	ND 338912
2656	Hackness : The Battery	ND 336914
5567	Lyness, Hoy : diesel pumping station	ND 301943
5438	Lyness, Hoy : steam pumping station and oil tank	ND 309947
3302	Stanger Head Battery	ND 374924
1437	Upper Cairn : souterrain	HY 220054

#### **HARRAY & STENNESS**

<b>SCHEDULED MONUMENTS</b>		
1237	Ballart House, burnt mound	HY 303164

90341	Barnhouse Stone, standing stone	HY 312121
1341	Boardhouse, mound 225m SSE of Bimbister	HY 328159
1339	Breckquoy, mound 230m SE of, Netherbrough	HY 314167
1489	Bridge of Scuan, 375m NNE of Scuan	HY 320188
1428	Burrian Broch, broch, Corrigall	HY 323193
90076	Click Mill, 500m ESE of Eastabist, Dounby	HY 325228
1256	Cummi Howe, broch	HY 282103
5871	Diamond Cottage	HY 283117
1248	Hall of Ireland, cairns	HY 290098
1272	Handest, settlement, Dounby	HY 302207
1398	Hollands, mound S of, Mirbister	HY 315199
1392	Hollands: two mounds SSE of, Mirbister	HY 316198
1282	Howen Brough, broch, Corston	HY 318191
1431	Knowe of Burrian : broch	HY 308168
1455	Knowe of Gullow : broch	HY 307163
90232	Knowe of Onstan, or Unstan : chambered cairn	HY 283117
1311	Knowe of Yesko : mound	HY 312208
1315	Knowes of Trinnawin : mounds	HY 334189
1316	Knowes of Trotty : mounds	HY 342172
7647	Lochview, standing stones and cairn	HY 303128
90209	Maes Howe : chambered cairn	HY 318128
1322	Melrose : mound	HY 321171
1464	Midhouse : broch	HY 308199
1326	Mound Dilly : cairn	HY 304202
1337	Ness : mound	HY 305148
1468	Nettleter : broch	HY 323174
1358	Newhouse : cairn	HY 304211
1335	Quoyer : mound	HY 314139
90042	Ring of Brodgar : stone circle	HY 294133
1390	Staney Hill : standing stone	HY 319156
90285	Stenness : stone circle and henge	HY 306126
8177	Watch Stone, stone settings, Barnhouse Settlement and related remains	HY 300120
7855	Wasbister, Stenness- Sandwick parish boundary, earthwork	HY 291137
1417	Yeldavale : mound	HY 311166

## HOLM & WIDEFORD

SCHEDULED MONUMENTS		
1434	Castle Howe : broch	HY 513003
6153	Cornquoy, barrow 200m SSE of Holm	ND 523996
1277	Hillock of Garth : cairn	HY 470067
1276	Hillocks of Garth : mounds	HY 467078
6246	Lamb Holm, settlement 450m WSW of Italian Chapel	HY 484005
1462	Loch of Ayre : broch	HY 470013
1359	North Cairn : chambered cairn	ND 526992

## KIRKWALL

SCHEDULED MONUMENTS		
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90193	Bishops Palace'	HY 447108
90194	Earls Palace'	HY 448108
90154	Grain Earth House : souterrain	HY 442117
4346	Pickaquoy : burnt mound & settlement	HY 441112

#### **NORTH RONALDSAY**

<b>SCHEDULED MONUMENTS</b>		
1419	Brae of Stennabreck : house	HY 770526
8631	Bride's Loch burnt mound:340m WNW of Bride's Kirk	HY 768523
1427	Burrian : broch	HY 762514
6596	Dennis Head,Old Lighthouse	HY 789553
1384	Holland: standing stone	HY 752529
1449	Howmae Brae : settlement	HY 758522
8632	Knowe O' Samilands, burnt mound	HY 765530
8645	Muckle Gairsty, linear earthworks between Viggay Banks and Gairsna Geo	HY 758529
1334	Neven : mound	HY 772550
8651	Strom Ness, settlement 400m S of Howar	HY 760514
8647	Southness, farm mound	HY 767526
8650	Versa Breck, buildings 130m W of Lighthouse	HY 783559

#### **ORPHIR & SCAPA**

<b>SCHEDULED MONUMENTS</b>		
1461	Broch of Lingro : broch	HY 434087
4725	Bu of Orphir : burnt mound and mill dam	HY 333046
90236	Earls Bu : Norse settlement and mill	HY 334043
1338	Groundwater : mound	HY 369087
1351	Groundwater : mounds	HY 375087
1445	Hillock of Breakna : broch	HY 353055
3245	Houton Chapel	HY 312035
6405	Lavacroon, settlement W of Bu of Orphir	HY 332044
1463	Loch of Kirbister : enclosures	HY 371081
90235	St Nicholas Church	HY 334043

#### **PAPA WESTRAY**

<b>SCHEDULED MONUMENTS</b>		
1433	Castle of Bothikan : broch	HY 492497
2198	Holm of Papa : chambered cairn	HY 505523
90163	Holm of Papa : long cairn	HY 509518
90195	Knap of Howar : houses	HY 483519
4065	Knowes of Maebeck : burnt mound	HY 494522
1466	Munger House : house	HY 486527
3759	Ramni Geo Chambered Cairn	HY 507518
1484	St Boniface Church	HY 488527
1478	St Boniface Graveyard : tombstone	HY 488527
2124	St Tredwalls Chapel & Brough	HY 496508

#### **ROUSAY, EGILSAY & WYRE**

<b>SCHEDULED MONUMENTS</b>		
90035	Blackhammer Cairn : chambered cairn	HY 414276
2292	Braes of Rinyo : settlement	HY 440323
1425	Brough : broch, Westside	HY 372303
1254	Cobbie Rows Burden : chambered cairn	HY 438280
90079	Cobbie Rows Castle	HY 442264
1255	Cogar : burnt mound	HY 395327
1263	Eynhallow : standing stone & mound	HY 359287
90144	Eynhallow Church and settlement	HY 359289
1269	Geord of Nears : cairn	HY 423273
1451	Knowe of Burrian : broch	HY 400275
1291	Knowe of Craie : chambered	HY 419315
1293	Knowe of Dale : burnt mound	HY 374320
1298	Knowe of Gorn : burnt mound	HY 387334
1456	Knowe of Hunclett : broch	HY 414273
1300	Knowe of Laird : long cairn	HY 398279
1301	Knowe of Lingro : chambered cairn	HY 396324
1306	Knowe of Ramsay : chambered cairn	HY 401288
1307	Knowe of Rowiegar : chambered cairn	HY 373298
1310	Knowe of Swandro : mound	HY 375297
90198	Knowe of Yarso : chambered cairn	HY 404279
1286	Loch of Knitchin : cairn	HY 429288
1377	Loch of Scockness : broch	HY 449331
1267	Long Stone : standing stone	HY 404275
1363	Lower Quandale : burnt mound	HY 368319
90218	Midhowe Broch	HY 371308
90219	Midhowe Cairn : chambered cairn	HY 372306
1469	North Howe : broch	HY 370307
3549	Onziebust : chambered cairn	HY 474278
1367	Quoynalonga Ness : burnt mound	HY 364319
3864	Skirmie Clett : enclosures	HY 455262
90137	St Magnus Church, Egilsay	HY 466304
90317	St Marys Chapel, Wyre	HY 443264
90297	Taversoe Tuick : chambered cairn	HY 426276
5773	The Wirk, tower and hall, Westness, Rousay	HY 373301
1401	Too of Nugle : cairn	HY 382335
1364	Upper Quandale : cairn	HY 373315
1476	Viera Lodge : broch	HY 391281
3534	Westness : Viking houses, noost & graveyard	HY 375296
3626	Westness Church	HY 374302
1416	Yateness Stone : standing stone	HY 447327

#### **SANDAY**

<b>SCHEDULED MONUMENTS</b>		
1236	Augmond Howe, Cairn, Els Ness	HY 676375
1480	Backaskaill Bay: Cross Parish Church	HY 653392
1331	Mount Misery : chambered	HY 784435



90243	Quoyness : chambered cairn	HY 677378
6162	Scar, Viking Burials and settlement NE of, Sanday	HY 676457
1353	Sivers Geo : mounds	HY 670376
5080	Tofts Ness : cairns, enclosures and field systems	HY 755466
1330	Tres Ness : chambered cairn	HY 711375
1424	Wasso : broch	HY 709379
3399	Whistlebare : platform settlement	HY 663450

## SANDWICK

SCHEDULED MONUMENTS		
1418	Borwick, Brough of : broch	HY 224167
1487	Breckness House	HY 224093
1246	Brockan : burnt mound	HY 230095
1385	Brockan : standing stones	HY 230092
6214	Brough of Bigging, promontory fort, Yesnaby	HY 219157
1243	Buckan : chambered cairn	HY 286141
1429	Burrian : broch	HY 296183
1430	Burrian : broch	HY 288153
1347	Cumbla Newgarth : mounds	HY 261190
5286	East Bigging : burnt mounds	HY 226149
1346	East Bigging : burnt mounds	HY 226150
1333	East House : burnt mound	HY 289206
1332	East House : mound	HY 291208
1264	Fan Knowe : burnt mound	HY 299197
1279	Howaback : mound	HY 293195
1288	Knowe of Angerow : mound	HY 235172
1299	Knowes of Howana : mound	HY 264216
1317	Knowes of Yonbell : two mounds	HY 245225
1348	Linga Fold : mounds	HY 264153
1423	Loch of Clumly : broch	HY 251164
1460	Loch of Harray : broch	HY 276176
1349	Mid House : five mounds	HY 277161
1336	Mid House : mound	HY 292208
1488	Nether Benzieclett : house	HY 280205
1406	Newbigging : two mounds	HY 252220
1370	Ring of Bookan : chambered cairn	HY 283145
1352	Rosemount & Easthouse : five mounds	HY 273165
1379	Skae Frue : mound	HY 282144
4591	Skara Brae : settlement	HY 229188
90276	Skara Brae : settlement	HY 231188
1380	South Seatter : mound	HY 233163
2399	South Unigarth : souterrain	HY 246173
1472	Stackrue : broch	HY 270151
1342	Stockan : mound	HY 264179
1393	Stones of Via: chambered cairn, Loch of Clumly	HY 260160
1475	Verron : broch	HY 230197
1470	Vestra Field : enclosure & quarry	HY 239217
1409	Vestra Field : four mounds	HY 241221

1266	Vetquoy : five mounds	HY 268186
1344	Voy : burnt mound	HY 253149
7700	Wasbister Disk Barrow and Round House	HY 288137
7855	Wasbister, Stenness- Sandwick parish boundary, earthwork	HY 291137
7857	Wasbister, mounds SSE of The Brecks	HY 285142

### SHAPINSAY

SCHEDULED MONUMENTS		
1325	Castle Bloody : chambered cairn	HY 536164
1275	Helliar Holm : chambered cairn	HY 484154
1421	Hillock of Burroughston : broch	HY 541210
1328	Hillock of Howe : broch	HY 512162
1482	Linton Chapel	HY 530186
1323	Mor Stein or Standing Stone	HY 524168
1447	The Hillock : broch	HY 536223
1407	Unyatauk : mound	HY 524198

### SOUTH RONALDSAY & BURRAY

SCHEDULED MONUMENTS		
1383	Cloddyhall : standing stone	ND 434895
1438	East Broch of Burray	ND 489988
3268	Hoxa Battery & Balfour Battery, Hoxa Head	ND 403928
2136	Isbister : chambered cairn	ND 470846
1386	Sorquoy : standing stone	ND 469914

### ST. ANDREWS & DEERNESS

SCHEDULED MONUMENTS		
2438	Bay of Meil : chapel	HY 479117
4654	Brough of Deerness : chapel & settlement	HY 596087
3249	Car Ness Battery	HY 466145
1435	Dingys Howe : broch	HY 547033
1439	Eves Howe : broch	HY 548061
1273	Hawell : burnt mound	HY 512065
1274	Head of Work : long cairn	HY 483138
1283	The Howie : mound	HY 588054

### STRONSAY

SCHEDULED MONUMENTS		
1479	Auskerry : chapel & Monkshouses	HY 677159
1382	Auskerry : two standing stones	HY 670162
3681	Auskerry Island : homestead	HY 678164
3689	Auskerry Island : kelp kiln	HY 675159
3691	Auskerry Island : long cist capstone	HY 679162
3756	Auskerry Island : longhouse	HY 670167
3836	Auskerry Island : mound	HY 670167
3852	Auskerry Island : mound & rectilinear foundations	HY 671168

3857	Auskerry Island : recumbent stones	HY 674166
3859	Auskerry Island : square structure	HY 672188
3889	Auskerry Island : three stones	HY 677162
3862	Auskerry Island : two graves	HY 677164
3873	Auskerry Island : two rectangular buildings	HY 676160
1242	Benni Cuml : mound	HY 671214
1436	Doocot Knowe, broch, Papa Stronsay	HY 665299
1260	Earls Knoll : long cairn	HY 668292
1443	Green Hill : broch	HY 632300
1391	Grice Ness : cairn	HY 672284
1446	Hillock of Baywest : broch	HY 619242
1278	Holm of Huip : cairn	HY 628311
5631	Lamb Head : broch	HY 690214
1399	Linga Holm : mound	HY 617275
1374	Linga Holm : two cairns	HY 614273
5992	Lochend, chambered cairn 450m NW, of Stronsay	HY 617288
1361	Orams Fancy : two cairns	HY 645271
1411	Ward of Housebay : chambered cairn	HY 670211

## WESTRAY

SCHEDULED MONUMENTS		
1329	Howa Tower : chambered cairn	HY 435446
1452	Knowe of Burristae : broch	HY 431429
1457	Knowe of Queen oHowe : broch	HY 425495
90337	Links of Noltland : settlements	HY 428492
90231	Noltland Castle	HY 429488
90240	Pierowall Church	HY 439488
1366	Quoybirse : standing stone	HY 443472
1388	Trenabie Farm : standing stone	HY 443510
8208	Tuquoy, settlement W of Cross- Kirk, Westray	HY 454431
90312	Westside : Tuquoy Church	HY 455432

## SEA of the Orkney Islands Inter-isles Connectivity Strategy (STAG Study)

### APPENDIX C Present Provision of Ferry and Air Transport

#### Ferries

Ferries are a vital mode of travel within the Orkney Islands as a means of connecting the smaller North and South Isles with the mainland of Orkney and/or with each other. Orkney Ferries, a company owned and subsidised by Orkney Islands Council, operates nine ferries to thirteen islands, most of which have a Roll-On, Roll-Off service. The exceptions in the North Isles are North Ronaldsay and Papa Westray which both receive limited Lift-On, Lift-Off services and are also served by the internal air service. In the South Isles, Graemsay also has a Lift-On, Lift-Off service and the associated service to Moaness in Hoy is for passengers only. The ferries operate to summer and winter timetables and, for a period of approximately 9 weeks from January to March, there is a further 'refit' timetable while each vessel is taken out of service for its annual refit.

Tables 1.1 and 1.2 describe the present level of connectivity between the Isles and mainland Orkney.

**Table 1.1: Number of ferry rotations per week from the Isles to the Orkney Mainland**

ISLAND	SUMMER 2007			WINTER 06/07		
	Mon-Fri	Sat	Sun	Mon-Fri	Sat	Sun
Shapinsay	6	5	5	6	4	2
Hoy	6	3	2 - 6	5	3	0
Flotta	4	3	2.5 Jun-Aug	2 - 3	2 - 3	0
Graemsay	2 - 3	1.5	1.5	2	1 on request, 1 weekend per month	
Moaness, Hoy	4 - 5	2	2			
Rousay	6	6	5	6	6	0
Egilsay	3 - 4	3	2	3 - 4	3	0
Wyre	4 - 5	5	4	3 - 4	5	0
Eday	2	2	1.5	1.5	1.5	0.5
Sanday	2 - 3	2	1.5	1.5 - 2	1.5	0.5
Stronsay	2 - 3	2	1.5	1.5 - 2	1.5	0.5
Westray	3	3	1.5	1.5 - 2	1.5	0.5
Papa Westray	2 sailings per week					
North Ronaldsay	1 weekly sailing			1 weekly sailing		

**Table 1.2: Number of ferry rotations per week from the Orkney Mainland to the Isles**

ISLAND	SUMMER 2007			WINTER 06/07		
	Mon-Fri	Sat	Sun	Mon-Fri	Sat	Sun
Shapinsay	5	4	4	5	3	1
Hoy	5.5	2.5	1.5 - 4.5	4.5	2.5	0
Flotta	3.5	2.5	2 Jun-Aug	3.5	2.5	0
Graemsay	4 - 5	2	2	3	2 on request 1 weekend per month	
Moaness, Hoy	3.5 - 4.5	2	2	2	2 sailings on 1 weekend per month	
Rousay	5.5	5.5	4.5	5.5	5.5	0

ISLAND	SUMMER 2007			WINTER 06/07		
<b>Egilsay</b>	2.5 - 3.5	2.5	2	2.5 - 3.5	2.5	0
<b>Wyre</b>	3.5 - 4.5	4.5	3	3.5 - 4.5	4.5	0
<b>Eday</b>	1.5 - 3	2	1.5	1 - 2	2	1
<b>Sanday</b>	1.5 - 2	2	1.5	2	2	1
<b>Stronsay</b>	1.5 - 3	2	1.5	1.5 - 2	2	1
<b>Westray</b>	2 - 3	2	1.5	2	2	1
<b>Papa Westray</b>	2 sailings per week			2 sailings per week		
<b>North Ronaldsay</b>	1 weekly sailing			1 weekly sailing		

Statistics for the period 2000 to 2006 indicate a general increase in ferry usage but between 2004-05 and 2005-06 passenger and vehicle numbers have tended to level, indicating constraints in capacity.

Passenger, car and commercial vehicle numbers for each year over the period 2000-01 to 2005-06 Tables are presented in **Tables 1.3 to 1.5**.

**Table 1.3: Passengers carried by the Orkney inter-island ferries during the period 2000-01 to 2005-06**

MAINLAND TO AND FROM:	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
<b>Hoy, Lyness</b>	54,012	56,337	55,158	59,709	66,206	63,501
<b>Flotta</b>	7,520	7,286	7,365	10,229	10,174	9,939
<b>Graemsay</b>	5,349	5,736	5,521	5,036	5,347	5,161
<b>North Hoy</b>	11,038	10,683	11,828	13,030	14,864	13,205
<b>Shapinsay</b>	56,988	61,739	60,920	64,314	64,317	64,512
<b>Rousay, Egilsay</b>	50,691	50,488	50,751	56,317	56,710	52,006
<b>Westray</b>	35,034	35,390	37,730	39,131	41,495	40,023
<b>Sanday</b>	21,331	21,839	23,384	24,832	26,162	26,509
<b>Stronsay</b>	16,249	16,945	17,837	17,644	16,720	16,510
<b>Eday</b>	7,614	6,950	8,331	8,722	8,279	8,650
<b>North</b>	596	587	551	533	754	485
<b>Papa Westray</b>	682	727	624	674	588	542
<b>Inter Island /</b>	682	727	624	674	588	542
<b>TOTAL</b>	<b>277,823</b>	<b>284,608</b>	<b>290,595</b>	<b>310,251</b>	<b>322,077</b>	<b>311,829</b>

Source: Orkney Ferries Ltd

**Table 1.4: Cars carried by the Orkney inter-island ferries during the period 2000-01 to 2005-06**

<b>MAINLAND TO AND FROM:</b>	<b>2000-01</b>	<b>2001-02</b>	<b>2002-03</b>	<b>2003-04</b>	<b>2004-05</b>	<b>2005-06</b>
<b>South Isles</b>	18,157	18,663	18,843	20,593	21,193	20,125
<b>Shapinsay</b>	7,359	7,495	7,721	7,446	7,526	7,603
<b>Rousay, Egilsay &amp; Wyre</b>	9,466	9,796	9,579	9,370	9,350	9,173
<b>Westray</b>	7,720	7,880	8,723	9,337	9,148	9,404
<b>Sanday</b>	4,205	4,192	4,774	5,276	5,560	5,616
<b>Stronsay</b>	2,855	3,290	3,687	3,819	3,760	3,497
<b>Eday</b>	1,485	1,531	1,947	2,067	1,991	2,054
<b>TOTAL</b>	<b>51,247</b>	<b>52,847</b>	<b>55,274</b>	<b>57,908</b>	<b>58,528</b>	<b>57,472</b>

Source: Orkney Ferries Ltd

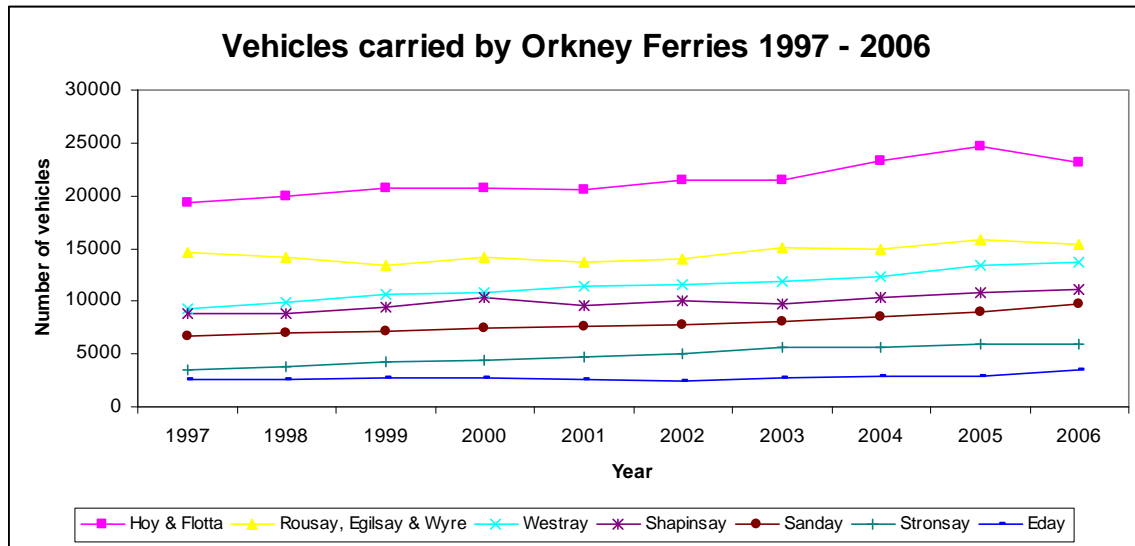
**Table 1.5: Commercial vehicles carried by the Orkney inter-island ferries during the period 2000-01 to 2005-06**

<b>MAINLAND TO AND FROM:</b>	<b>2000-01</b>	<b>2001-02</b>	<b>2002-03</b>	<b>2003-04</b>	<b>2004-05</b>	<b>2005-06</b>
<b>South Isles</b>	2,450	2,779	2,681	2,724	3,220	2,816
<b>Shapinsay</b>	2,303	2,600	2,094	2,871	3,267	3,543
<b>Rousay, Egilsay &amp; Wyre</b>	4,262	4,267	4,536	5,485	5,740	5,042
<b>Westray</b>	3,650	3,644	3,136	3,032	3,809	3,787
<b>Sanday</b>	3,353	3,575	3,333	3,191	3,237	3,935
<b>Stronsay</b>	1,864	1,802	1,995	1,830	2,169	2,360
<b>Eday</b>	1,033	892	846	760	868	1,387
<b>TOTAL</b>	<b>18,915</b>	<b>19,559</b>	<b>18,621</b>	<b>19,893</b>	<b>22,310</b>	<b>22,870</b>

Source: Orkney Ferries Ltd

The number of vehicles carried on each route between 1997 and 2006 is also shown graphically in Figure 1.

Figure 1: Number of vehicles carried on each route between 1997 and 2006



### The inter-island air service

Air travel is also important to the population of the Orkney Islands - for business and leisure use; for travel by itinerant teachers; to allow patient travel to and from hospital in Kirkwall, Aberdeen or further afield; and as a means of access for tourists visiting Orkney, which represents a vital part of the economy. The inter-isles air service complements the ferry service, allowing short journey times to and from the islands. Operated by Loganair, the service is subsidised by Orkney Islands Council and run as a Public Service Obligation.

The Inter-Isles air service presently provides:

- Two - three flights to Papa Westray on five days per week; two flights on Saturday and one on Sunday, all year;
- Two flights daily to Westray on six days per week and one on Sunday, all year;
- Two flights daily to Sanday and Stronsay on six days per week, all year;
- Two flights to Eday on Wednesday, all year.
- Two – three flights to North Ronaldsay on five days per week and two on both Saturday and Sunday throughout winter; Three – four flights on five days per week, two on Saturday and three on Sunday during the summer.

## APPENDIX D Assessment of Orkney Islands Inter-isles Connectivity Strategy

**Table 12: Assessment of the Environmental Effects of all Possible Options for the Preferred Strategy**

**KEY TO SYMBOLS:**

✓ = positive environmental effect; ✓✓ = strongly positive effect # = negative environmental effect; ## = strongly negative environmental effect;  
 □ = no environmental effect; ? = effect uncertain LT = Long term; MT = Medium term; ST = Short term

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
FERRY SERVICE  Replacement ferry vessels	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
1. Replace the Earl Sigurd, Earl Thorfinn and Varagen ferry vessels with new, larger, compliant vessels.	✓✓ LT	✓✓ LT	□	✓ LT	□	□	□	□	✓✓ LT	✓✓ LT	□	✓ LT	No
<p><b>Comment:</b> The new vessels would be longer and wider than those which presently operate on the Outer North Isles routes, and would be designed to suit the open water conditions surrounding the North Isles. A diesel-electric system would manage the power requirements of the vessels, allowing engine usage to be adjusted as required. When at sea a minimum of two engines should be in operation. The vessels would operate at speeds of up to 13 knots at 85% of Maximum Continuous Rating. Emissions must comply with International Maritime Organisation (IMO) regulations and the diesel-electric system would produce lower emissions than those from the present ferries, e.g. engine start-up while alongside the pier would be electronically controlled allowing a more efficient air/fuel mix and hence more complete combustion of fuel and improved local air quality. The increase in vessel size would lead to an increase in fuel consumption; however this would be balanced by increased engine efficiency.</p> <p>The ferries would be powered by marine gas oil which is a low-sulphur fuel. Approximately 30 tonnes of fuel would be stored in-board on the vessels within separately-supported tanks thus minimising the risk of damage to tanks and pollution incidents. A further 3 tonnes of lubricating oil would be stored. Fuel and lubricating oil would be taken on board from road tankers at the Kirkwall pier. Absorbent pads are presently, and will continue to be, carried for use on deck to contain any minor spillages. An oily water separator would treat waste water to IMO standards prior to its disposal to sea in open waters. Each vessel would contain a holding tank on board where, alternatively, oily water could be stored prior to pumping ashore for onward storage at Bossack Civic Amenity site then shipment to mainland UK for disposal. There would be a further holding tank for sewage on board and each vessel would have a treatment plant for treatment of sewage to the required standard prior to disposal at sea. The accommodation space of the ferries would be electrically heated. Clean drinking water taken on board at Kirkwall pier would be stored in purpose-built potable water tanks. Cooked food would no longer be provided for passengers and instead snacks and drinks would be available from vending machines. Containers would be installed in the passenger lounge for the collection of cans, glass bottles and paper for recycling. Waste would then be disposed of to an onshore container for collection by Harbours staff. Other waste from the vessel would be disposed of as specified in Orkney Ferries' Waste Management Plan. The vessels would meet requirements laid down for the carriage of disabled passengers and their vehicles by the Disabled Persons Transport Advisory Committee (DiPTAC), providing improved access and more comfortable conditions for all passengers. It is anticipated that these improvements and the increased frequency of service would impact positively on the populations of the islands by promoting enhanced access to facilities and services on mainland Orkney, and by facilitating increased levels of economic activity in the Isles. The new ferries would be powered by medium speed engines running at 800 – 1000 rpm and would be much quieter and more comfortable than those of the present ferries which are operated by high speed engines which run at 1200 – 2000 rpm.</p>													



OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for North Ronaldsay  Option (a) Non-tidal RO-RO service direct to Kirkwall using large ferry vessel	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to present terminal at Nouster, North Ronaldsay to provide non-tidal RO-RO access</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> The present pier would be extended and a further 'leg' constructed perpendicular to its east side. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. No priority species or habitats have been recorded in the vicinity of the pier but details of benthic flora and fauna of the surrounding area are not currently available. This area is close to the Sanday SAC which is designated for common seal, so Appropriate Assessment would be necessary. The coastline of the island is designated as a Site of Local Nature Conservation Importance. Native North Ronaldsay sheep which graze the intertidal may be vulnerable to disturbance. Aspects of the works could lead to locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would also be possible. Minor impact on geology would be likely due to piling. The increased size of the pier and RO-RO infrastructure would add to its impact on the local landscape. Impact on cultural heritage is uncertain. There are no Scheduled Ancient Monuments in the immediate vicinity of the pier but when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The closest scheduled monument is Howmae Brae which is located 1 km to the east of the pier. The use of primary aggregates and sand would lead to short term negative impact on material assets. Some of these would be sourced locally but it may be necessary to source further rock from outwith the county. If the dredged materials proved suitable they could be re-used in construction of the pier. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed adjacent to terminal at North Ronaldsay to allow access to pier for larger ferry vessels</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	# ST	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. There would be medium-term negative impact on benthic fauna and flora as an area of marine substrate would be removed. The sea bed around Nouster Pier is not designated and no priority habitats or species are recorded but its benthic cover is unknown. Dredging could also lead to locally increased levels of suspended solids in the water environment. Negative impact would be expected on a small area of seabed geology. If blasting proved necessary, Cetaceans could be negatively impacted by underwater noise. Appropriate Assessment would be necessary due to proximity to Sanday SAC. The potential impact on cultural heritage is uncertain but no protected wrecks are known in this area. Some disposal of dredge spoil might be necessary but the intention would be to reuse as much as possible in construction of the pier.</p>													
<b>3. Operation of Option (a), a non-tidal Ro-Ro service direct to Kirkwall</b>	✓ LT	✓ LT	□	✓ LT	□	□	□	?	✓✓ LT	✓✓ LT	□	✓ LT	No
<p><b>Comment:</b> Generally the impacts would be positive, as the new ferries would produce lower emissions which, in turn, would result in improvements to climatic factors and air quality. Improved treatment of effluents and lower noise emissions would lead to positive impact on the marine environment. Increased connectivity and improved access and passenger comfort on the ferry would bring about positive impacts on population and human health issues.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for North Ronaldsay  Option (b) Non-tidal RO-RO service between North Ronaldsay and Sanday using dedicated smaller vessel	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to present terminal at Nouster, North Ronaldsay to provide non-tidal RO-RO access</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> Option (b) would feature a smaller ferry than Option (a) so proposed pier modification would be shorter than that under Option (a). Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. No priority species or habitats have been recorded in the vicinity of the pier but no details of benthic flora and fauna of the surrounding area are currently available. This area is close to the Sanday SAC which is designated for common seal, so Appropriate Assessment would be necessary. The coastline of the island is designated as a Site of Local Nature Conservation Importance. Native North Ronaldsay sheep which graze the intertidal may be vulnerable to disturbance. Aspects of the works could lead to locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would also be possible. Minor impact on geology would be likely due to piling. The increased size of the pier and RO-RO infrastructure would add to its impact on the local landscape. Impact on cultural heritage is uncertain. There are no Scheduled Ancient Monuments in the immediate vicinity of the pier but when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The closest scheduled monument is Howmae Brae which is located 1 km to the east of the pier. The use of primary aggregates and sand would lead to short term negative impact on material assets. Some of these would be sourced locally but it may be necessary to source further rock from outwith the county. If the dredged materials proved suitable they could be re-used in construction of the pier. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed adjacent to terminal at North Ronaldsay to allow access to pier for ferry vessel</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	# ST	Yes
<p><b>Comment:</b> Dredging operation would result in short-term exhaust emissions from dredge vessel. Negative impact on benthic biodiversity would be expected as a small area of marine substrate would be altered. The sea bed around Nouster Pier is not designated but its benthic cover is unknown. There would be locally increased levels of suspended solids in the water environment. If blasting is required negative impact would be possible on geology. EPS, e.g. Cetaceans might be affected by noise. Appropriate Assessment would be necessary due to proximity to Sanday SAC. The potential impact on cultural heritage is uncertain but no protected wrecks are recorded in this area. Some disposal of dredge spoil might be necessary but the intention would be to reuse as much as possible in construction of the breakwater.</p>													
<b>4. Dredging of seabed associated with construction of new terminal on north coast of Sanday</b>	# ST	□	# LT	# ST	□	# LT	□	?	□	□	□	# ST	Yes
<p><b>Comment:</b> Dredging operation would result in short-term exhaust emissions from dredge vessel. Negative impact would be highly probable on biodiversity, as this area is the subject of multiple designations due to its natural heritage importance. The coastline is part of the Sanday SAC, East Sanday Coast SPA, a Ramsar site and the East Sanday Coast SSSI. Appropriate Assessment of the project would be required. Dredging would lead to increased levels of suspended solids in the water environment. This area's designation as an SAC and SSSI is due in part to the presence of reefs, sandflats and mudflats and dredging would be incompatible with their protection and could increase coastal erosion. A large area of the seabed of Otterswick contains dense beds of eelgrass, <i>Zostera marina</i> which is a UK Species of Conservation Concern. There would also be potential for negative impact to undiscovered archaeological remains. The natural heritage interests of the area would be vulnerable to noise and to the presence of the dredge vessel.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for North Ronaldsay  Option (b) Non-tidal RO-RO service between North Ronaldsay and Sanday (contd.)	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>5. Construction of new terminal on north coast of Sanday</b>	# ST	# ST	## LT	# ST	? ?	# LT	# LT	? ?	□ □	□ □	# ST	# ST	Yes
<p><b>Comment:</b> Under this option a new terminal would be constructed on the north coast of Sanday, probably to the south-west of Kirk Taing on the shore of Otterswick. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be highly probable on biodiversity, as this area is the subject of multiple designations due to its natural heritage importance. The coastline is part of the Sanday SAC, East Sanday Coast SPA, a Ramsar site and the East Sanday Coast SSSI and otters may also be present. Appropriate Assessment of the project would therefore be required. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Aspects of the works could lead to a risk of increased levels of suspended solids in the water environment close to the terminal. Changes to water movement and sediment transport would be possible as a result of terminal development, and these could lead to increasing risk of coastal erosion along the vulnerable coastline to the north-east of the proposed development site. Minor impact on geology would be likely due to piling. Land-Take would result in negative impact on soil in the vicinity of the terminal. Minor impact on geology would be likely due to piling. This area is important for its geomorphology, and landforms such as sandbanks and mudflats would be vulnerable to any changes in tidal movement and sediment distribution which could result from the introduction of a new coastal structure. Long-term negative impact on the local landscape would be possible. No Scheduled Ancient Monuments are present in this area but a number of Burnt Mounds are marked on the OS 1:50,000 map and negative impact to undiscovered archaeological remains would be possible. Use of primary aggregates and sand would lead to short term negative impact on material assets. Most of these would be sourced locally but some rock might be sourced from outwith the county. The construction work would result in minor increases in background noise.</p>													
<b>6. Upgrading of roads on Sanday to link new terminal with original terminal at Loth</b>	# ST	# ST	# LT	# ST	# LT	? ?	# LT	? ?	□ □	# LT	# ST	# LT	Yes
<p><b>Comment:</b> Construction work would result in short-term exhaust emissions from vehicles, and slight temporary effects are possible from dust and fumes. If any part of the road in question bordered or crossed a designated area, e.g. the Central Sanday SSSI then the biological or geomorphological interests of that site may be vulnerable to damage from the road-works. Negative impact due to increased suspended sediment in water courses would be possible and if roads were widened, soil would also be impacted due to land take and excavation. Potential impact on geology is uncertain. Negative impact on landscape would be possible and would depend on width of road and signage etc. The increase in traffic would lead to increased risk of road accidents and increased environmental noise. The construction work would result in minor increases in background noise.</p>													
<b>7. Operation of Option (b), a non-tidal Ro-Ro service between North Ronaldsay and Sanday</b>	✓ LT	✓ LT	# LT	✓ LT	? ?	□ □	□ □	? ?	✓ LT	# LT ✓ LT	□ □	# LT	Yes
<p><b>Comment:</b> The vessel which would be purchased for Option (b) would be similar to the large vessels described above but somewhat smaller. The environmental impacts of this vessel would therefore be similar to that of the larger vessels. However, operation of the service through such a heavily designated area would have the potential to impact negatively on the biodiversity, flora and fauna of the area and would require Appropriate Assessment. There would be positive impact on the population of North Ronaldsay. However the increased road traffic, in particular heavy goods vehicles, passing through Sanday would lead to an increased risk of road accidents and increased noise.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Papa Westray  Option (a) RO-RO service to Kirkwall using large ferry	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to present terminal at Moclett, Papa Westray to provide RO-RO access for large ferry vessel and direct link with Kirkwall</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> This option would require major alterations to Moclett Pier. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Area is also close to Papa Westray SPA which comprises North Hill SSSI, designated for its importance as a breeding site for Arctic skua and Arctic tern, and Holm of Papa Westray SSSI, designated for its importance as a breeding site for black guillemot. Appropriate Assessment of the project would therefore be necessary. Aspects of the works, e.g. those involving concrete and aggregates could lead to a risk of locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would be possible. Minor impact on geology would be likely due to piling. Negative impact on the local landscape is possible due to the increased size of the pier and RO-RO infrastructure. The closest Scheduled Ancient Monument to the pier is the Castle of Bothikan, a broch, which is located c. 400m to the NW at HY492 497. Impact on the broch and its historical setting would be uncertain and there is also potential, when carrying out construction work, for negative impact on previously undiscovered archaeological remains. Use of primary aggregate and sand would lead to short term negative impact on material assets. Most of these would be sourced locally but some rock might be sourced from outwith the county. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed adjacent to terminal at Moclett, Papa Westray to allow access to pier for large ferry vessel</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. No priority habitats are known to be present on the seabed of the Bay of Moclett but its benthic cover is not fully recorded. Dredging would lead to short-term, locally increased levels of suspended solids in the water environment. Habitats which would be sensitive to the effects of increased suspended solids and sedimentation include <i>Zostera marina</i> beds off the Bight of Quoyolie off the south-west of Papa Westray and a small bed of the mussel, <i>Musculus discors</i> off Sheepheight on the south-east. A number of aquaculture sites are present in the area and these may also be vulnerable to the effects of increased suspended solids. The site which is closest to Moclett Pier is located off the west coast of Vest Ness. Appropriate Assessment would be necessary due to proximity to Papa Westray SPA. The impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Disposal of the resulting dredge spoil would be necessary.</p>													
<b>3. Operation of Option (a), a direct link with Kirkwall</b>	✓ LT	✓ LT	□	✓ LT	□	□	□	□	✓✓ LT	✓✓ LT	□	✓ LT	No
<p><b>Comment:</b> Generally the impacts would be positive. However this option would not include the benefits of a direct link with Pierowall in Westray and the opportunity for the two islands to share services and facilities.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Papa Westray Option (b) RO-RO service to Westray using cascaded vessel	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to present terminal at Moclett, Papa Westray to provide RO-RO access for cascaded ferry vessel</b>	# ST	# ST	# ST	# ST	□	□	?	?	□	□	# ST	□	Yes
<p><b>Comment:</b> Under this option a ramp would be built alongside the present jetty and the vessel Eynhallow would be cascaded to operate the Papa Westray – Pierowall route until its replacement by a new vessel. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. However, in the longer term, emissions would be likely to decrease as the present twice-weekly sailings to Kirkwall would be replaced by the new service to Pierowall. Negative impact during construction would be possible on biodiversity, flora and fauna, e.g. European Protected Species, otter which may be present in the area. The nearby Links of Moclett, an area of dune grassland, is a Site of Local Nature Importance for botanical reasons but would be unlikely to be impacted. The area is also close to Papa Westray SPA which comprises North Hill SSSI, designated for its importance as a breeding site for Arctic skua and Arctic tern, and Holm of Papa Westray SSSI, designated for its importance as a breeding site for black guillemot. Appropriate Assessment of the project would therefore be necessary. Aspects of the works, e.g. those involving concrete and aggregates could lead to locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Impact on the area’s landscape is unlikely as the ramp would be a low-level structure and for much of the time would be under water. Impact on cultural heritage is uncertain as there is potential, when carrying out construction work, for negative impact on previously undiscovered archaeological remains. The closest Scheduled Ancient Monument to the pier is the Castle of Bothikan, a broch, which is located c. 400m to the NW at HY492 497. Neither construction of the ramp nor future operation of the service is likely to impact on the broch or the setting in which it sits. Use of primary aggregate and sand would lead to short term negative impact on material assets. It is anticipated that these materials would be sourced locally. The construction work would result in minor increases in background noise.</p>													
<b>2. Modifications to present terminal at Pierowall, Westray to provide RO-RO access for cascaded ferry vessel</b>	# ST	# ST	# ST	# ST	□	□	?	?	□	□	# ST	□	Yes
<p><b>Comment:</b> Under this option a ramp would be constructed alongside the western pier. The work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact during construction would be possible on biodiversity, flora and fauna, e.g. European Protected Species, otter which may be present in the area. Aspects of the works, e.g. those involving concrete and aggregates could lead to locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Impact on the area’s landscape is unlikely as the ramp would be a low-level structure and for much of the time would be under water. Impact on cultural heritage is uncertain as there is potential, when carrying out construction work, for negative impact on previously undiscovered archaeological remains. There are no Scheduled Ancient Monuments in the vicinity of the Pier. The adjacent Gill Pier is used by a range of vessels including a tender which is used to service nearby aquaculture sites, and the Golden Mariana which presently provides a passenger-only ferry service between Pierowall and Papa Westray. Use of primary aggregate and sand would lead to short term negative impact on material assets. It is anticipated that these materials would be sourced locally. The construction work would result in minor increases in background noise.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Papa Westray Option (b) RO-RO service to Westray using cascaded vessel	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>3. Dredging of seabed adjacent to terminal at Pierowall Westray</b>	# ST	☐	# ST	# ST	☐	# LT	☐	?	☐	☐	☐	☐	<b>Yes</b>
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as a small area of marine substrate would be altered. No priority habitats are known to be present on the seabed of Bay of Pierowall but its benthic cover is not fully recorded. Zostera beds have been recorded off Backaskaill on the south-west of Papa Westray. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. A number of aquaculture sites are present in the area which may be vulnerable to the effects of increased suspended solids. Sites in the vicinity of Bay of Pierowall are located off Scarfhall Point and Ouse Ness. Appropriate Assessment would be necessary due to proximity to Papa Westray SPA. Minor impact on geology would be possible. The impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Disposal of the resulting dredge spoil would be necessary.</p>													
<b>4. Operation of Option (b), a direct link with Westray</b>	✓ LT	☐	☐	☐	☐	☐	☐	?	✓ LT	✓ LT	☐	☐	<b>No</b>
<p><b>Comment:</b> Replacement of the present twice-weekly sailings to Kirkwall by the new service to Pierowall would result in reduced ferry emissions associated with this connection. However this would be partially offset by an increase in road vehicle use to and from the island due to the upgrade to a RO-RO service. Improved connectivity for Papa Westray and the upgrade to a RO-RO service would be expected to have a positive impact on the island's population. Improved connectivity between Westray and Papa Westray would allow improved sharing of facilities on both islands, e.g. in the provision of education and health facilities.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<p style="text-align: center;"><b>Westray</b></p> <p style="text-align: center;"><b>Modifications required to piers prior to replacement of present RO-RO vessels with new, larger fully compliant vessels</b></p>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to Rapness Pier, Westray to accommodate larger ferries</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> Rapness pier would be extended and the linkspan made wider to accommodate the larger ferries. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Rapness Pier is also close to Faray and Holm of Faray SAC which is designated for its importance to grey seal, an Annex II species, so Appropriate Assessment would be necessary in order to further assess the project's impact on the conservation interests of this site. No priority species or habitats have been recorded in the vicinity of the pier but no details of benthic flora and fauna of the surrounding area are currently available. Work involving cement and aggregates could lead to locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications to the pier could add to its impact on the local landscape. There are no Scheduled Ancient Monuments in the vicinity of the pier but when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed adjacent to Rapness Pier</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from dredge vessel. Negative impact on benthic flora and fauna would be expected as a small area of marine substrate would be altered. No priority habitats are known to be present on the seabed off Rapness but its benthic cover is not fully recorded. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. European Protected Species, e.g. Cetaceans might be affected by noise. The approach to Rapness is close to Faray and Holm of Faray SAC which is designated due to its importance for grey seal. Appropriate Assessment would therefore be necessary in order that any impact of the dredging operation on the Conservation Objectives of the site may be assessed. Minor impact on geology would be possible. Any impact on cultural heritage would be uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Disposal of the resulting dredge spoil would be necessary.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Eday  Modifications required to piers prior to replacement of present RO-RO vessels with new, larger fully compliant vessels	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modification to Backaland Pier, Eday to accommodate larger ferries</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> Backaland pier would be extended and the linkspan made wider to accommodate the larger ferries. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Backaland Pier is also close to Calf of Eday SPA and SSSI which is designated for its importance to aggregations of breeding seabirds including cormorant, fulmar, greater black-backed gull, guillemot and kittiwake. Appropriate Assessment would therefore be necessary in order to further assess the project's impact on the conservation interests of this site. The available marine biotope data indicate that while much of the surrounding substrate is infralittoral rock dominated by kelp and dense red algae, areas of the priority habitat maerl are also present in the south Eday Channel to the east and south-east of Veness and to the west of Linga Holm. Work involving cement and aggregates could lead to locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications to the pier could add to its impact on the local landscape. Impact on cultural heritage is uncertain. There are no Scheduled Ancient Monuments in the vicinity of the pier but when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. Two aquaculture sites are located in Eday Sound, one of which is c. 1 km north of the pier. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed adjacent to Backaland Pier</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from dredge vessel. Negative localised impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. The available marine biotope data indicate that while much of the surrounding substrate is infralittoral rock dominated by kelp and dense red algae, areas of the priority habitat maerl are also present in the south Eday Channel to the east and south-east of Veness and to the west of Linga Holm. Backaland Pier is also close to Calf of Eday SPA and SSSI which is designated for its importance to aggregations of breeding seabirds including cormorant, fulmar, greater black-backed gull, guillemot and kittiwake. Appropriate Assessment would therefore be necessary in order to further assess the possible impact of dredging on the conservation interests of this site. Minor impact on geology would be possible. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains, however no protected wrecks are known in this area. Two aquaculture sites are located in Eday Sound, one of which is c. 1 km north of the pier and would be vulnerable to the effects of increased suspended solids. Disposal of the resulting dredge spoil would be necessary.</p>													



OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<p style="text-align: center;"><b>Sanday</b></p> <p style="text-align: center;"><b>Modifications required to piers prior to replacement of present RO-RO vessels with new, larger fully compliant vessels</b></p>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modification to Loth Pier, Sanday to accommodate larger ferry vessels</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> Loth pier would be extended and the linkspan made wider to accommodate the larger ferries. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Loth Pier is also close to Calf of Eday SPA and SSSI which is designated for its importance to aggregations of breeding seabirds, including cormorant, fulmar, greater black-backed gull, guillemot and kittiwake. Also nearby is Sanday SAC which is designated for its importance to common seal. Appropriate Assessment would therefore be necessary in order to further assess the project's impact on the conservation interests of these sites. The available marine biotope data indicate that much of the offshore substrate is infralittoral rock dominated by kelp and dense red algae. Immediately offshore from the pier is an area of circalittoral rock with sparse fauna and <i>Abietinaria abietina</i>, which is not a priority species. Work involving concrete and aggregates could lead to locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications to the pier could add to its impact on the local landscape. Impact on cultural heritage is uncertain. There are no Scheduled Ancient Monuments in the vicinity of the pier but when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. Two aquaculture sites are located in Eday Sound. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed adjacent to Loth Pier</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from dredge vessel. Negative localised impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. The available marine biotope data indicate that the surrounding substrate is infralittoral rock dominated by kelp and dense red algae, and Immediately offshore from the pier is an area of circalittoral rock with sparse fauna and <i>Abietinaria abietina</i>, a species of hydroid. Neither are UK priority habitats or species. Loth Pier is also close to Calf of Eday SPA and SSSI which is designated for its importance to aggregations of breeding seabirds including cormorant, fulmar, greater black-backed gull, guillemot and kittiwake. Appropriate Assessment would therefore be necessary in order to further assess the possible impact of dredging on the conservation interests of this site. Minor impact on geology would be possible. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Two aquaculture sites are located in Eday Sound. Disposal of the resulting dredge spoil would be necessary.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Westray, Eday and Sanday  Replacement of present RO-RO vessels with (a) three or (b) two new larger, fully compliant vessels	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>Option (a) replacement of present RO-RO vessels with three new vessels</b>	✓✓ LT	✓✓ LT	☐	✓ LT	☐	☐	☐	?	✓✓ LT	✓✓ LT	☐	✓ LT	<b>No</b>
<p><b>Comment:</b> This option would result in replacement of the present Earls Sigurd and Thorfinn and the Varagen by three larger, more fuel-efficient, fully compliant vessels and would allow the greatest improvement in connectivity to the islands. The Earls would be sold and the Varagen would initially be cascaded to the South Isles route, allowing the Hoy Head to be cascaded to the Shapinsay route and the Shapinsay to service Rousay, Egilsay and Wyre. The Eynhallow would then be cascaded to the Papa Westray-Westray route.</p> <p>Overall, the impacts would be positive, as the new ferries would produce lower emissions which, in turn, would result in improvements to climatic factors and air quality. Improved treatment of effluents and lower noise emissions would lead to positive impact on the marine environment. Increased connectivity and improved access and passenger comfort on the ferry would bring about positive impacts on population and human health issues.</p>													
<b>Option (b) replacement of present RO-RO vessels with two new vessels</b>	✓ LT	✓ LT	☐	✓ LT	☐	☐	☐	?	✓ LT	✓ LT	☐	✓ LT	<b>No</b>
<p><b>Comment:</b> Under this option one of the present Earls would have to be retained to maintain an adequate level of service. Even then the older vessel would not be fully compliant with European Union requirements and would require substantial modification which would include a resultant reduction in deck space.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA													
Options for Stronsay  Option (a) Relocation of Stronsay terminal to Linga Sound	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?	
<b>1. Construction of new Stronsay terminal on a site on the west coast of Stronsay adjacent to Linga Sound</b>	# ST	# ST	# ST	# ST	# LT	# LT	# LT	? ?	□	□	# ST	# ST	Yes	
<p><b>Comment:</b> A new terminal would be located just south of the area marked Pier of Stursy on the OS 1:50,000 map. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Linga Holm, a small island which lies less than 1 km to the west of the site of the proposed terminal, is owned by the Scottish Wildlife Trust and is a breeding and pupping site for grey seal which is listed as a protected species under Annex II and Annex V of the Habitats Directive. Excavation work and operations requiring the use of cement could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Construction of the terminal and associated marshalling area would require a limited amount of land take and loss of soil environment. Minor impact on geology would be likely due to piling. Construction of the terminal and associated linkspan would cause impact on landscape and relevant features for consideration would include lighting and signage etc. There are no Scheduled Ancient Monuments in the vicinity of the proposed site but when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. Use of primary aggregates and sand would lead to short term negative impact on material assets. Most of these would be sourced locally but some rock might be sourced from outwith the county. The construction work would result in minor increases in background noise.</p>														
<b>2. Construction of access road to relocated Stronsay terminal</b>	# ST	# ST	# ST	# ST	# LT	? ?	# LT	? ?	□	□	# ST	# ST	Yes	
<p><b>Comment:</b> Construction work would result in short-term exhaust emissions from vehicles, and slight temporary effects are possible from dust in the immediate vicinity of the site. Negative impact would be possible on biodiversity, flora and fauna, e.g. EPS, otter may be in the area and although the proposed route of the road does not lie within any designated area, the habitats and species present are not known. Excavation work could lead to increased suspended solids in water courses. Construction of the road will require a limited amount of land take and the resulting disturbance to the soil environment. The potential effect on the geology of the area will be unknown until survey work is carried out. Negative impact on landscape would be possible and would depend on width of road and signage etc. Use of primary aggregates would lead to short term negative impact on material assets. Most of these would be sourced locally but some rock might be sourced from outwith the county. The construction work would result in minor increases in background noise.</p>														
<b>3. Dredging of the seabed around the new terminal and its approaches</b>	# ST	□	# ST	# ST	□	# LT	□	? ?	□	□	□	□	Yes	
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. There would be localised negative impact on benthic fauna and flora as an area of marine substrate would be removed. The sea bed around Linga Sound is not designated and no priority habitats or species are recorded but its benthic cover is unknown. Disposal of dredge spoil would be necessary. Dredging could also lead to locally increased levels of suspended solids in the water environment. Minor impact on geology would be likely. The potential impact on cultural heritage is uncertain. No protected wrecks are known in this area.</p>														

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<p style="text-align: center;"><b>Options for Stronsay</b></p> <p><b>Option (a) Relocation of Stronsay terminal to Linga Sound</b></p>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>4. Operation of option (a), a ferry service from a terminal relocated to the west coast of Stronsay</b>	✓✓ LT	✓✓ LT	? ?	✓ LT	□	□	□	? ?	✓✓ LT	✓✓ LT	□	✓ LT	<b>No</b>
<p><b>Comment:</b> The results of environmental assessment of Option (a), operation of the ferry service from a relocated Stronsay terminal, identify positive impacts on climate factors and local air quality, these due to the greater efficiency of the new ferry vessel engines and the reduction in route length which relocation of the terminal would allow. Positive impact is also identified on the water environment as a result of the improved storage and/or treatment on board the vessels of fuel and waste water. The benefits of improved connectivity between Stronsay and Kirkwall, Eday and Sanday and the reduction in travelling time at sea would have positive impacts on population and human health factors, and reduced noise would be beneficial both to humans and to the natural environment. Although the proposed location of the new terminal is within 1 km of Linga Holm, which is owned and managed by the Scottish Wildlife Trust as a sanctuary for grey seal, it is unlikely that the operation of the ferry service will have a negative impact on the seal colony.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Stronsay Option (b) Modification of existing terminal to accommodate new vessels	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to terminal at Whitehall, Stronsay to accommodate larger vessel</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> The present pier would be extended and the linkspan widened to accommodate the longer, wider ferries. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and Cetaceans which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Whitehall village is low-lying and would be vulnerable to any possible rise in sea level. SEPA's indicative flood maps show that much of the village could be vulnerable to flooding. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications to the pier could add to its impact on the local landscape. Impact on cultural heritage is uncertain. There are no Scheduled Ancient Monuments in the immediate vicinity of the pier – the nearest are to be found on the adjacent island of Papa Stronsay and these include the Doocot Knowe broch and the Earl's Knoll long cairn. Papa Stronsay House is also a listed building, and Golgotha Monastery on the island is home to a group of Transalpine Redemptorist monks. However, when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed along entry channel to Whitehall Pier</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. No priority habitats are known to be present on the seabed off the north coast of Stronsay but its benthic cover is not recorded. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. The approach to Whitehall is relatively close to the Sanday SAC which is designated partly due to its importance for common seal. Appropriate Assessment would therefore be necessary in order that any impact of the dredging operation on the Conservation Objectives of the site may be assessed. Minor impact on geology would be possible. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Disposal of the resulting dredge spoil would be necessary.</p>													
<b>3. Continued operation of service from terminal at Whitehall, Stronsay</b>	✓ LT	✓ LT	□	?	□	□	# LT	□	✓ LT	✓ LT	□	✓ LT	No
<p><b>Comment:</b> The entrance channel to Whitehall pier is shallow, and sharp turns must be negotiated to remain within its safe limits, even by the ferry vessels which presently service this route. The increased draft and length of the new vessels would present added challenges to approaching and berthing at the pier. Extensive capital dredging to Papa Sound would be required to enable the new vessels to gain entry and, over time, regular maintenance dredging would also be necessary. A further factor for consideration is distance to Whitehall and the time (and fuel) needed to negotiate round Holm of Huip and through Papa Sound. The area around the pier is low-lying and is shown on SEPA's indicative flood maps to be at risk of flooding.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Option for Rousay, Egilsay and Wyre  Option (a) Cascaded vessel and associated modifications and required works to terminals	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to terminal at Rousay</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> The ferry vessel Shapinsay would be lengthened and cascaded to operate the Rousay, Egilsay and Wyre service. Brinyan pier may be lengthened but modification of the ramp would not be necessary. The construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications could add to impact of pier on local landscape. Rousay contains many Scheduled Ancient Monuments but none of these is in the immediate vicinity of the pier. Impact on cultural heritage is uncertain as in carrying out construction there is potential for negative impact to undiscovered archaeological remains. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed around Rousay Pier</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. Extensive maerl beds are known to be present on the seabed between Rousay and Wyre. Maerl is a UK priority habitat and is susceptible to the blanketing effect of suspended solids. An area of <i>Zostera marina</i> is also present off the eastern shore of the neighbouring island of Eynhallow. Minor impact on geology would be possible. Possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Disposal of the resulting dredge spoil would be necessary.</p>													
<b>3. Modifications to Egilsay terminal</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> The Egilsay terminal would be extended to accommodate the Shapinsay but the ramp should not require modification. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Operations requiring use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Three aquaculture sites are located in Rousay Sound and may be vulnerable to increased suspended solids. Minor impact on geology would be likely due to piling. Modifications to the pier could add to its impact on the local landscape. There are Scheduled Ancient Monuments in Egilsay but none of these is in the immediate vicinity of the pier. However, impact on cultural heritage would be uncertain. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Option for Rousay, Egilsay and Wyre  Option (a) Cascaded vessel and associated modifications and required works to terminals	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
4. Dredging of seabed around Egilsay Pier	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. Extensive maerl beds are known to be present on the seabed immediately to the north of the pier and across the Sound between Egilsay and Rousay. Maerl is a UK priority habitat and is susceptible to the blanketing effect of suspended solids. Three aquaculture sites are located in Rousay Sound and may also be vulnerable to increased suspended solids. Minor impact on geology would be possible. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Disposal of the resulting dredge spoil would be necessary.</p>													
5. Modifications to Wyre terminal	# ST	# ST	# ST	# ST	□	□	✓ LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> At Wyre the dog-leg extension would be removed from the end of the pier to allow improved ease of access to the larger vessel. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Modifications to the pier could have positive impact on the local landscape. There are Scheduled Ancient Monuments in Wyre but none of these is in the immediate vicinity of the pier. However, impact on cultural heritage is uncertain as when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The construction work would result in minor increases in background noise.</p>													
6. Dredging of seabed around Wyre Pier	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. Extensive maerl beds are known to be present on the seabed between Rousay and Wyre. Maerl is a UK priority habitat and is susceptible to the blanketing effect of suspended solids. An area of <i>Zostera marina</i> is also present off the eastern shore of the neighbouring island of Eynhallow – which is surprising as the waters surrounding Eynhallow are characterised by very strong tidal flows. Minor impact on geology would be possible. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains, however no protected wrecks are known in this area. Disposal of the resulting dredge spoil would be necessary.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<b>Rousay, Egilsay and Wyre</b>  <b>Option (a) Cascaded vessel and associated modifications and required works to terminals</b>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>7.Operation of service to Rousay, Egilsay and Wyre</b>	# ST	☐	☐	☐	☐	☐	☐	?	✓ LT	✓ LT	☐	☐	No
<b>Comment:</b> Deployment of the larger vessel would result in increased exhaust emissions until the Shapinsay is ultimately replaced by a new vessel. The increased deck capacity should result in positive impact on the island's population and the vessel's greater size should result in a more comfortable crossing for passengers.													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<b>Rousay, Egilsay and Wyre</b>  <b>Option (b) Relocate Egilsay terminal to reduce journey time between Rousay, Egilsay and Wyre</b>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Relocate Egilsay terminal to the south of the island</b>	# ST	# ST	# ST	# ST	☐	# LT	# LT	?	☐	☐	# ST	# ST	Yes
<b>Comment:</b> A new terminal would be located in the south of the island. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Excavation work and operations requiring the use of cement could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Construction of the terminal and associated marshalling area would require a limited amount of land take and loss of soil environment. Minor impact on geology would be likely due to piling. Construction of the terminal and associated linkspan would cause impact on landscape and relevant features for consideration would include lighting and signage etc. There are no Scheduled Ancient Monuments in the vicinity of the proposed site but when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. Use of primary aggregates and sand would lead to short term negative impact on material assets. Most of these would be sourced locally but some rock might be sourced from outwith the county. The construction work would result in minor increases in background noise.													



OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<p align="center"><b>Rousay, Egilsay and Wyre</b></p> <p align="center"><b>Option (b) Cascaded vessel and operation of service to include new Egilsay terminal</b></p>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<p><b>2. Operation of service to Rousay, Egilsay and Wyre featuring relocated Egilsay terminal</b></p>	?	☐	☐	☐	☐	☐	☐	?	✓ LT	✓ LT	☐	☐	<b>No</b>
<p><b>Comment:</b> Deployment of the larger vessel would result in increased exhaust emissions until the Shapinsay is ultimately replaced by a new vessel. However this may be balanced by the shorter journey time to the relocated Egilsay pier. The increased deck capacity should result in positive impact on the island's population and the vessel's greater size should result in a more comfortable crossing for passengers.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Shapinsay  Cascaded vessel and associated modifications and required works to terminal	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to terminal at Shapinsay</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> The ferry vessel, Hoy Head would be cascaded to operate the Shapinsay service. The linkspan would be relocated to the opposite side of the pier and the pier would be lengthened. Construction work would result in short-term exhaust emissions from vehicles, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications to the pier could add to its impact on the local landscape. Balfour Castle, its grounds and the village come under a Gardens and Designed Landscapes designation and Balfour village is an Urban Conservation Area. There are no Scheduled Ancient Monuments in the immediate vicinity of the pier but Balfour Castle and many buildings in the village are listed. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed around Shapinsay Pier</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. No priority habitats or species are recorded in the vicinity of the pier but tide-swept <i>Modiolus modiolus</i> beds and maerl beds are located to the east in Shapinsay Sound and there is an extensive area of maerl in Wide Firth to the west of Shapinsay. These are species/habitats which would be vulnerable to the blanketing effect of suspended solids and therefore to the dumping of dredge spoil. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. Aquaculture farms are located in Carness Bay and Bay of Meil nearby and may be vulnerable to increased suspended solids. Minor impact on geology would be possible. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Porpoises are known to pass through 'The String', the strongly tidal channel which separates Shapinsay from the Orkney Mainland.</p>													
<b>3. Operation of the Shapinsay service</b>	# ST	□	□	□	□	□	□	?	✓ LT	✓ LT	□	□	No
<p><b>Comment:</b> Deployment of the larger vessel would result in increased exhaust emissions until the Hoy Head were ultimately replaced by a new vessel. The increase deck capacity should result in positive impact on the island's population and the vessel's greater size should mean fewer sailings are cancelled due to adverse weather conditions and should result in a more comfortable crossing for passengers.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Graemsay and Moaness  Stretch Graemsay vessel and associated modifications to Graemsay terminal	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to terminal at Graemsay</b>	# ST	☐	☐	# ST	☐	☐	?	?	☐	☐	# ST	☐	Yes
<p><b>Comment:</b> There will be slight modification of the pier at Graemsay, involving construction of either a small ramp or landing platform, to allow landing of heavy goods either side of High Water. Works requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Graemsay lies within the National Scenic Area but it is not considered that the proposed modification to the pier would have any detrimental effect on the landscape of the area. However a formal assessment would be necessary. Potential impact on cultural heritage interests is uncertain. The increased capacity of the ferry vessel and the proposed facility for unloading heavy goods is expected to have a positive impact on the population of the island. The use of primary aggregates and sand would lead to short term slight negative impact on material assets, most of which would be sourced locally. There will be no requirement for dredging to be carried out at the Graemsay pier.</p>													
<b>2. Operation of the service between Graemsay and Moaness</b>	# LT	☐	☐	☐	☐	☐	☐	☐	✓ LT	✓ LT	☐	☐	No
<p><b>Comment:</b> Plans are currently under way to lengthen the ferry vessel Graemsay in order to increase its deck capacity. This will slightly increase the weight of the vessel and its fuel usage (and therefore its emissions). The increased capacity of the ferry vessel and the proposed facility for unloading heavy goods is expected to have a positive impact on the population of Graemsay. Modifications will not be necessary to the pier at Moaness, Hoy, as this part of the route will continue to be operated as a passenger only service. The increased capacity of the vessel will also benefit the population of the North of Hoy as it will increase access for residents and will help promote tourism in the area.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Hoy and Flotta  Option (a) Cascaded vessel and associated harbour works at Lyness, Flotta and Houton	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to terminal at Lyness</b>	# ST	# ST	# ST	# ST	□	□	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> Initially the ferry vessel Varagen would be cascaded to operate the Hoy and Flotta service. The Varagen would then be due for replacement three years following the introduction of the new North Isles ferries. At Lyness the linkspan would require to be widened to accommodate the wider vessel but no changes would be necessary to the length of the pier. The construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Modifications to the pier are unlikely to add to its impact on the local landscape as the surrounding landscape is largely developed. A range of Scheduled Ancient Monuments are located at Lyness. These include a diesel pumping station, a steam pumping station and an oil tank dating from the Second World War. However, impact on cultural heritage is uncertain as when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise. Dredging would not be necessary around Lyness pier.</p>													
<b>2. The terminal at Longhope</b>	□	□	□	□	□	□	□	□	□	□	□	□	No
<p><b>Comment:</b> No modifications will be required to the terminal at Longhope.</p>													
<b>3. Modifications to terminal at Flotta</b>	# ST	# ST	# ST	# ST	□	# LT	□	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> At Flotta the linkspan would require to be widened to accommodate the wider vessel and it might be necessary to extend the pier. The construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications to the pier are unlikely to result in significant impact on the local landscape as the area is largely developed due to the presence of the oil terminal. Two Scheduled Ancient Monuments are located in Flotta – the Buchanan Battery and the Stanger Head Battery - but neither is in the immediate vicinity of the pier. However, impact on cultural heritage is uncertain as when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Hoy and Flotta  Option (a) Cascaded vessel and associated harbour works at Lyness, Flotta and Houton	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>4. Dredging of seabed around Flotta Pier</b>	# ST	☐	# ST	# ST	☐	# LT	☐	?	☐	☐	☐	☐	Yes
<b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. No priority habitats are known to be present on the seabed off the north coast of Flotta but its benthic cover is not recorded. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. Minor impact on geology would be possible. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. The wreck of HMS Vanguard lies off the north shore of Flotta and is protected under the Orkney Harbour Byelaws 1977 which prohibit diving on the wreck.													
<b>3. Modifications to terminal at Houton</b>	# ST	# ST	# ST	# ST	☐	# LT	# LT	?	☐	☐	# ST	# ST	Yes
<b>Comment:</b> At Houton the linkspan would require to be widened to accommodate the wider vessel and it would be necessary to extend the pier. The construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications to the pier could increase its impact on the local landscape. No Scheduled Ancient Monuments are located in the immediate vicinity of the pier. However, impact on cultural heritage is uncertain as when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise													
<b>4. Dredging of seabed around Houton Pier</b>	# ST	☐	# ST	# ST	☐	# LT	☐	?	☐	☐	☐	# ST	Yes
<b>Comment:</b> The entrance channel to Houton Pier is narrow and a significant amount of dredging and possibly blasting would be required in order to permit access for the larger ferry vessel. Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. No priority habitats are known to be present on the seabed of this area but its benthic cover is not recorded. Minor impact on geology would be likely. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area.													
<b>5. Operation of the service between Houton, Lyness and Flotta</b>	# ST	☐	☐	☐	☐	☐	☐	☐	✓ LT	✓ LT	☐	☐	No
<b>Comment:</b> The Varagen is larger than the present ferry, Hoy Head so its fuel usage (and therefore its emissions) will be higher. The increased capacity and deck space is expected to have a positive impact on the populations of Hoy and Flotta. The Hoy head can presently carry 14-16 cars, whereas the Varagen can carry 30 cars.													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Hoy and Flotta  Option (b) Cascaded vessel, associated works at Lyness and Flotta and re-route to Stromness	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to terminal at Stromness</b>	# ST	# ST	# ST	# ST	□	?	?	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> It may be necessary to modify the existing linkspan at Stromness. The construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Stromness is part of a National Scenic Area but it is not considered that the proposed modification to the pier will have any detrimental effect on the landscape of the area. However a formal assessment would be necessary. The construction work would result in minor short term impact on material assets and may result in minor background noise.</p>													
<b>2. Operation of the service between Stromness, Lyness and Flotta</b>	# ST	□	□	□	□	□	□	?	✓ LT	✓ LT	□	□	No
<p><b>Comment:</b> The Varagen is larger than the present ferry, the Hoy Head, so its fuel usage (and therefore its emissions) will be higher. The Hoy Head can presently carry 14-16 cars, whereas the Varagen can carry 30 cars. The increased capacity and deck space is expected to have a positive impact on the populations of Hoy and Flotta The sea journey to Stromness would be ten minutes longer than the journey to Houton and the bus journey from Stromness to Kirkwall would also be ten minutes longer than the journey from Houton to Kirkwall. However, it is possible that people would choose to shop and carry out much of their business in Stromness rather than in Kirkwall, thus benefiting the town of Stromness. The Varagen is due for replacement three years after the cascade and a further option could be to replace the Varagen with a medium speed catamaran which would have similar power output to the Varagen, and would use a similar quantity of fuel but would be cleaner due to its modern, more efficient engines.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Hoy and Flotta  Option (c) Cascaded vessel, relocate terminal to bring Head, Hoy and re-route to Stromness	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
1. Construction of new terminal at Bring Head, Hoy	# ST	# ST	# LT	# ST	# LT	# LT	# LT	? □	□	□	# ST	# ST	Yes
<p><b>Comment:</b> Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the site. However, in the long term, the decrease in journey time between Hoy and Stromness would lead to a reduction in both emissions and journey time. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Bring Head lies within the part of Hoy which is designated an SAC, SPA and SSSI and Appropriate Assessment would be necessary. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Aquaculture sites are located off Bring Head and also a little farther south in Chalmer's Hope and could be susceptible to increased .</p> <p>Extensive upgrading of the road between Bring Head and South Walls would be necessary to accommodate the increase in traffic, especially Heavy Goods Vehicles. This would involve significant land take and further impact on the natural heritage interests of the area. Impact on geology and cultural heritage would be uncertain. This is also part of the National Scenic Area and construction of a ferry terminal would be likely to impact negatively on its landscape character. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in increased background noise.</p>													
2. Operation of the service between Stromness, Bring Head and Flotta	✓ LT	□	# LT	□	□	□	□	? □	✓ LT	✓ LT	□	□	Yes
<p><b>Comment:</b> The reduction in journey time would lead to a reduction in emissions. Negative effect, due to land take for both the terminal and road upgrading, is likely to the natural heritage interests of the area which include its ornithology, botany and a range of habitats which within Orkney are unique to Hoy. Further long term negative impact would be probable on landscape. The decreased journey time between Hoy and the mainland of Orkney could result in positive impact on population as access to the mainland would be improved. Positive impact human health also likely due to shorter journey time.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<b>Air Service Option (a)</b>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Preserve air services as at present</b>	☐	☐	☐	☐	☐	☐	☐	?	✓ LT	✓ LT	☐	☐	<b>No</b>
<p><b>Comment:</b> Under this option, the air service would continue to be operated as at present under a Public Service Obligation, with a subsequent repeat tendering exercise at the end of the existing contract period (2009). This variant would seek to improve the present provision, for example by optimising the timetabling of flights. This would result in no change to the current level of emissions, and Orkney Islands Council would continue to maintain the island airstrips so use of material assets would also remain broadly similar to that in recent years. The positive impact on population and human health issues would continue.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<b>Air Service Option (b)</b>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>2. Provide additional capacity and flexibility in network</b>	# LT	☐	☐	☐	☐	☐	# LT	?	✓ LT	✓ LT	# LT	☐	<b>Yes</b>
<p><b>Comment:</b> Under this option, possibilities include a two plane operation throughout the year or installation of airstrip lighting to allow operations to start earlier or finish later during the winter months. More frequent flights would result in increased air emissions but it is not anticipated that the increase in flight frequency would be sufficient to affect local air quality which is generally good throughout the Orkney Islands. There would be no need to extend operating hours at Kirkwall Airport so increased use of runway de-icer used would not be required. Installation of airstrip lighting could have negative impact on landscape when in operation. Additional capacity and flexibility in the network would improve access to services and facilities on mainland Orkney, e.g. to attend hospital or dental appointments or to participate in cultural activities. Improved connectivity would benefit patients returning from hospital on mainland UK. Secondary effects such as increased levels of tourism could result from improved opportunities for people to visit the isles and to appreciate their natural and historic environments. Increased maintenance may be necessary on island airstrips and if lighting were installed this could also lead to further use of material assets.</p>													



OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<b>Air Service Option (c)</b>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>3. Rationalise air service network, focusing on lifeline connections where particular needs are not met by the ferry operation.</b>	✓ LT	☐	☐	☐	☐	☐	# LT	? #	✓ LT # LT	✓ LT # LT	# ST	☐	Yes
<p><b>Comment:</b> Under this option the air service would focus on those connections which are not fully satisfied by the ferry service alone. Depending on the nature of the ferry service option variants that are taken forward, attention is likely to focus on North Ronaldsay and, perhaps, Papa Westray. A focus on these links could see an enhancement in the connections, in terms of timings, capacity or airstrip lighting. Positive impact on climate factors could be expected in the event of a reduction in the air service. Installation of lighting at airstrips could have negative impact on landscape whilst in operation. Positive impact would be expected on the population and aspects of the residents' health of those islands which continue to be served by the air service as they would continue to have rapid access to services and facilities on the mainland of Orkney. Conversely, a degree of negative impact may be experienced by the residents of the islands where the air service becomes less frequent. If lighting were installed this could also lead to short term use of material assets.</p>													

## APPENDIX E Assessment of Orkney Islands Inter-isles Connectivity Strategy

**Table 13: Assessment of Environmental Effects of the Selected Options for the Preferred Strategy**

**KEY TO SYMBOLS:**

✓ = positive environmental effect; ✓✓ = strongly positive effect # = negative environmental effect; ## = strongly negative environmental effect;

□ = no environmental effect; ? = effect uncertain

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
FERRY SERVICE  Replacement ferry vessels	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
1. Replace the Earl Sigurd, Earl Thorfinn and Varagen ferry vessels with new, larger, compliant vessels.	✓✓ LT	✓✓ LT	□	✓ LT	□	□	□	□	✓✓ LT	✓✓ LT	□	✓ LT	No
<p><b>Comment:</b> The new vessels would be longer and wider than those which presently operate on the Outer North Isles routes, and would be designed to suit the open water conditions surrounding the North Isles. A diesel-electric system would manage the power requirements of the vessels, allowing engine usage to be adjusted as required. When at sea a minimum of two engines should be in operation. The vessels would operate at speeds of up to 13 knots at 85% of Maximum Continuous Rating. Emissions must comply with International Maritime Organisation (IMO) regulations and the diesel-electric system would produce lower emissions than those from the present ferries, e.g. engine start-up while alongside the pier would be electronically controlled allowing a more efficient air/fuel mix and hence more complete combustion of fuel and improved local air quality. The increase in vessel size would lead to an increase in fuel consumption; however this would be balanced by increased engine efficiency.</p> <p>The ferries would be powered by marine gas oil which is a low-sulphur fuel. Approximately 30 tonnes of fuel would be stored in-board on the vessels within separately-supported tanks thus minimising the risk of damage to tanks and pollution incidents. A further 3 tonnes of lubricating oil would be stored. Fuel and lubricating oil would be taken on board from road tankers at the Kirkwall pier. Absorbent pads are presently, and will continue to be, carried for use on deck to contain any minor spillages. An oily water separator would treat waste water to IMO standards prior to its disposal to sea in open waters. Each vessel would contain a holding tank on board where, alternatively, oily water could be stored prior to pumping ashore for onward storage at Bossack Civic Amenity site then shipment to mainland UK for disposal. There would be a further holding tank for sewage on board and each vessel would have a treatment plant for treatment of sewage to the required standard prior to disposal at sea. The accommodation space of the ferries would be electrically heated. Clean drinking water taken on board at Kirkwall pier would be stored in purpose-built potable water tanks. Cooked food would no longer be provided for passengers and instead snacks and drinks would be available from vending machines. Containers would be installed in the passenger lounge for the collection of cans, glass bottles and paper for recycling. Waste would then be disposed of to an onshore container for collection by Harbours staff. Other waste from the vessel would be disposed of as specified in Orkney Ferries' Waste Management Plan. The vessels would meet requirements laid down for the carriage of disabled passengers and their vehicles by the Disabled Persons Transport Advisory Committee (DiPTAC), providing improved access and more comfortable conditions for all passengers. It is anticipated that these improvements and the increased frequency of service would impact positively on the populations of the islands by promoting enhanced access to facilities and services on mainland Orkney, and by facilitating increased levels of economic activity in the Isles. The new ferries would be powered by medium speed engines running at 800 – 1000 rpm and would be much quieter and more comfortable than those of the present ferries which are operated by high speed engines which run at 1200 – 2000 rpm.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for North Ronaldsay  Option (a) Non-tidal RO-RO service direct to Kirkwall using large ferry vessel	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to present terminal at Nouster, North Ronaldsay to provide non-tidal RO-RO access</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> The present pier would be extended and a further 'leg' constructed perpendicular to its east side. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. No priority species or habitats have been recorded in the vicinity of the pier but details of benthic flora and fauna of the surrounding area are not currently available. This area is close to the Sanday SAC which is designated for common seal, so Appropriate Assessment would be necessary. The coastline of the island is designated as a Site of Local Nature Conservation Importance. Native North Ronaldsay sheep which graze the intertidal may be vulnerable to disturbance. Aspects of the works could lead to locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would also be possible. Minor impact on geology would be likely due to piling. The increased size of the pier and RO-RO infrastructure would add to its impact on the local landscape. Impact on cultural heritage is uncertain. There are no Scheduled Ancient Monuments in the immediate vicinity of the pier but when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The closest scheduled monument is Howmae Brae which is located 1 km to the east of the pier. The use of primary aggregates and sand would lead to short term negative impact on material assets. Some of these would be sourced locally but it may be necessary to source further rock from outwith the county. If the dredged materials proved suitable they could be re-used in construction of the pier. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed adjacent to terminal at North Ronaldsay to allow access to pier for larger ferry vessels</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	# ST	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. There would be medium-term negative impact on benthic fauna and flora as an area of marine substrate would be removed. The sea bed around Nouster Pier is not designated and no priority habitats or species are recorded but its benthic cover is unknown. Dredging could also lead to locally increased levels of suspended solids in the water environment. Negative impact would be expected on a small area of seabed geology. If blasting proved necessary, Cetaceans could be negatively impacted by underwater noise. Appropriate Assessment would be necessary due to proximity to Sanday SAC. The potential impact on cultural heritage is uncertain but no protected wrecks are known in this area. Some disposal of dredge spoil might be necessary but the intention would be to reuse as much as possible in construction of the pier.</p>													
<b>3. Operation of Option (a), a non-tidal Ro-Ro service direct to Kirkwall</b>	✓ LT	✓ LT	□	✓ LT	□	□	□	?	✓✓ LT	✓✓ LT	□	✓ LT	No
<p><b>Comment:</b> Generally the impacts would be positive, as the new ferries would produce lower emissions which, in turn, would result in improvements to climatic factors and air quality. Improved treatment of effluents and lower noise emissions would lead to positive impact on the marine environment. Increased connectivity and improved access and passenger comfort on the ferry would bring about positive impacts on population and human health issues.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Papa Westray Option (b) RO-RO service to Westray using cascaded vessel	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to present terminal at Moclett, Papa Westray to provide RO-RO access for cascaded ferry vessel</b>	# ST	# ST	# ST	# ST	□	□	?	?	□	□	# ST	□	Yes
<p><b>Comment:</b> Under this option a ramp would be built alongside the present jetty and the vessel Eynhallow would be cascaded to operate the Papa Westray – Pierowall route until its replacement by a new vessel. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact during construction would be possible on biodiversity, flora and fauna, e.g. European Protected Species, otter which may be present in the area. The nearby Links of Moclett, an area of dune grassland, is a Site of Local Nature Importance for botanical reasons but would be unlikely to be impacted. The area is also close to Papa Westray SPA which comprises North Hill SSSI, designated for its importance as a breeding site for Arctic skua and Arctic tern, and Holm of Papa Westray SSSI, designated for its importance as a breeding site for black guillemot. Appropriate Assessment of the project would therefore be necessary. Aspects of the works, e.g. those involving concrete and aggregates could lead to locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Impact on the area’s landscape is unlikely as the ramp would be a low-level structure and for much of the time would be under water. Impact on cultural heritage is uncertain as there is potential, when carrying out construction work, for negative impact on previously undiscovered archaeological remains. The closest Scheduled Ancient Monument to the pier is the Castle of Bothikan, a broch, which is located c. 400m to the NW at HY492 497. Neither construction of the ramp nor future operation of the service is likely to impact on the broch or the setting in which it sits. Use of primary aggregate and sand would lead to short term negative impact on material assets. It is anticipated that these materials would be sourced locally. The construction work would result in minor increases in background noise.</p>													
<b>2. Modifications to present terminal at Pierowall, Westray to provide RO-RO access for cascaded ferry vessel</b>	# ST	# ST	# ST	# ST	□	□	?	?	□	□	# ST	□	Yes
<p><b>Comment:</b> Under this option a ramp would be constructed alongside the western pier. The work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust and fumes in the immediate vicinity of the pier. Negative impact during construction would be possible on biodiversity, flora and fauna, e.g. European Protected Species, otter which may be present in the area. Aspects of the works, e.g. those involving concrete and aggregates could lead to locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Impact on the area’s landscape is unlikely as the ramp would be a low-level structure and for much of the time would be under water. Impact on cultural heritage is uncertain as there is potential, when carrying out construction work, for negative impact on previously undiscovered archaeological remains. There are no Scheduled Ancient Monuments in the vicinity of the Pier. The adjacent Gill Pier is used by a range of vessels including a tender which is used to service nearby aquaculture sites and the Golden Mariana which presently provides a passenger-only ferry service between Pierowall and Papa Westray. Use of primary aggregate and sand would lead to short term negative impact on material assets. It is anticipated that these materials would be sourced locally. The construction work would result in minor increases in background noise.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<p align="center"><b>Options for Papa Westray</b></p> <p><b>Option (b) RO-RO service to Westray using cascaded vessel</b></p>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<p><b>3. Dredging of seabed adjacent to terminal at Pierowall Westray</b></p>	# ST	☐	# ST	# ST	☐	# LT	☐	?	☐	☐	☐	☐	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as a small area of marine substrate would be altered. No priority habitats are known to be present on the seabed of Bay of Pierowall but its benthic cover is not fully recorded. Zostera beds have been recorded off Backaskaill on the south-west of Papa Westray. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. A number of aquaculture sites are present in the area which may be vulnerable to the effects of increased suspended solids. Sites in the vicinity of Bay of Pierowall are located off Scarfhall Point and Ouse Ness. Appropriate Assessment would be necessary due to proximity to Papa Westray SPA. Minor impact on geology would be possible. The impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Disposal of the resulting dredge spoil would be necessary.</p>													
<p><b>4. Operation of Option (b), a direct link with Westray</b></p>	✓ LT	☐	☐	☐	☐	☐	☐	?	✓ LT	✓ LT	☐	☐	No
<p><b>Comment:</b> Replacement of the present twice-weekly sailings to Kirkwall by the new service to Pierowall would result in reduced ferry emissions associated with this connection. However this would be partially offset by an increase in road vehicle use to and from the island due to the upgrade to a RO-RO service. Improved connectivity for Papa Westray and the upgrade to a RO-RO service would be expected to have a positive impact on the island's population. Improved connectivity between Westray and Papa Westray would allow improved sharing of facilities on both islands, e.g. in the provision of education and health facilities.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<b>Westray</b>  <b>Modifications required to piers prior to replacement of present RO-RO vessels with new, larger fully compliant vessels</b>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to Rapness Pier, Westray to accommodate larger ferries</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> Rapness pier would be extended and the linkspan made wider to accommodate the larger ferries. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Rapness Pier is also close to Faray and Holm of Faray SAC which is designated for its importance to grey seal, so Appropriate Assessment would be necessary in order to further assess the project's impact on the conservation interests of this site. No priority species or habitats have been recorded in the vicinity of the pier but no details of benthic flora and fauna of the surrounding area are currently available. Work involving cement and aggregates could lead to locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications to the pier could add to its impact on the local landscape. There are no Scheduled Ancient Monuments in the vicinity of the pier but when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed adjacent to Rapness Pier</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from dredge vessel. Negative impact on benthic flora and fauna would be expected as a small area of marine substrate would be altered. No priority habitats are known to be present on the seabed off Rapness but its benthic cover is not fully recorded. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. The approach to Rapness is close to Faray and Holm of Faray SAC which is designated due to its importance for grey seal. Appropriate Assessment would therefore be necessary in order that any impact of the dredging operation on the Conservation Objectives of the site may be assessed. Minor impact on geology would be possible. Any impact on cultural heritage would be uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Disposal of the resulting dredge spoil would be necessary.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<p style="text-align: center;"><b>Eday</b></p> <p style="text-align: center;"><b>Modifications required to piers prior to replacement of present RO-RO vessels with new, larger fully compliant vessels</b></p>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modification to Backland Pier, Eday to accommodate larger ferries</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> Backland pier would be extended and the linkspan made wider to accommodate the larger ferries. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Backland Pier is also close to Calf of Eday SPA and SSSI which is designated for its importance to aggregations of breeding seabirds including cormorant, fulmar, greater black-backed gull, guillemot and kittiwake. Appropriate Assessment would therefore be necessary in order to further assess the project's impact on the conservation interests of this site. The available marine biotope data indicate that while much of the surrounding substrate is infralittoral rock dominated by kelp and dense red algae, areas of the priority habitat, maerl, are also present in the south Eday Channel to the east and south-east of Veness and to the west of Linga Holm. Work involving cement and aggregates could lead to locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications to the pier could add to its impact on the local landscape. Impact on cultural heritage is uncertain. There are no Scheduled Ancient Monuments in the vicinity of the pier but when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. Two aquaculture sites are located in Eday Sound, one of which is c. 1 km north of the pier. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed adjacent to Backland Pier</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from dredge vessel. Negative localised impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. The available marine biotope data indicate that while much of the surrounding substrate is infralittoral rock dominated by kelp and dense red algae, areas of the priority habitat maerl are also present in the south Eday Channel to the east and south-east of Veness and to the west of Linga Holm. Backland Pier is also close to Calf of Eday SPA and SSSI which is designated for its importance to aggregations of breeding seabirds including cormorant, fulmar, greater black-backed gull, guillemot and kittiwake. Appropriate Assessment would therefore be necessary in order to further assess the possible impact of dredging on the conservation interests of this site. Minor impact on geology would be possible. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains, however no protected wrecks are known in this area. Two aquaculture sites are located in Eday Sound, one of which is c. 1 km north of the pier and would be vulnerable to the effects of increased suspended solids. Disposal of the resulting dredge spoil would be necessary.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<p style="text-align: center;"><b>Sanday</b></p> <p style="text-align: center;"><b>Modifications required to piers prior to replacement of present RO-RO vessels with new, larger fully compliant vessels</b></p>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modification to Loth Pier, Sanday to accommodate larger ferry vessels</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> Loth pier would be extended and the linkspan made wider to accommodate the larger ferries. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Loth Pier is also close to Calf of Eday SPA and SSSI which is designated for its importance to aggregations of breeding seabirds, including cormorant, fulmar, greater black-backed gull, guillemot and kittiwake. Also nearby is Sanday SAC which is designated for its importance to common seal. Appropriate Assessment would therefore be necessary in order to further assess the project's impact on the conservation interests of these sites. The available marine biotope data indicate that much of the offshore substrate is infralittoral rock dominated by kelp and dense red algae. Immediately offshore from the pier is an area of circalittoral rock with sparse fauna and <i>Abietinaria abietina</i>, which is not a priority species. Work involving concrete and aggregates could lead to locally increased levels of suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications to the pier could add to its impact on the local landscape. Impact on cultural heritage is uncertain. There are no Scheduled Ancient Monuments in the vicinity of the pier but when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. Two aquaculture sites are located in Eday Sound. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed adjacent to Loth Pier</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from dredge vessel. Negative localised impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. The available marine biotope data indicate that the surrounding substrate is infralittoral rock dominated by kelp and dense red algae, and Immediately offshore from the pier is an area of circalittoral rock with sparse fauna and <i>Abietinaria abietina</i>, a species of hydroid. Neither are UK priority habitats or species. Loth Pier is also close to Calf of Eday SPA and SSSI which is designated for its importance to aggregations of breeding seabirds including cormorant, fulmar, greater black-backed gull, guillemot and kittiwake. Appropriate Assessment would therefore be necessary in order to further assess the possible impact of dredging on the conservation interests of this site. Minor impact on geology would be possible. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Two aquaculture sites are located in Eday Sound. Disposal of the resulting dredge spoil would be necessary.</p>													



OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<p align="center"><b>Options for Westray, Eday and Sanday</b></p> <p align="center"><b>Replacement of present RO-RO vessels with (a) three or (b) two new larger, fully compliant vessels</b></p>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<p><b>1. Option (a) replacement of present RO-RO vessels with three new vessels</b></p>	✓✓ LT	✓✓ LT	☐	✓ LT	☐	☐	☐	?	✓✓ LT	✓✓ LT	☐	✓ LT	<b>No</b>
<p><b>Comment:</b> This option would result in replacement of the present Earls Sigurd and Thorfinn and the Varagen by three larger, more fuel-efficient, fully compliant vessels and would allow the greatest improvement in connectivity to the islands. The Earls would be sold and the Varagen would initially be cascaded to the South Isles route, allowing the Hoy Head to be cascaded to the Shapinsay route and the Shapinsay to service Rousay, Egilsay and Wyre. The Eynhallow would then be cascaded to the Papa Westray-Westray route.</p> <p>Overall, the impacts would be positive, as the new ferries would produce lower emissions which, in turn, would result in improvements to climatic factors and air quality. Improved treatment of effluents and lower noise emissions would lead to positive impact on the marine environment. Increased connectivity and improved access and passenger comfort on the ferry would bring about positive impacts on population and human health issues.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA													
Options for Stronsay  Option (a) Relocation of Stronsay terminal to Linga Sound	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?	
<b>1. Construction of new Stronsay terminal on a site on the west coast of Stronsay adjacent to Linga Sound</b>	# ST	# ST	# ST	# ST	# LT	# LT	# LT	?	□	□	# ST	# ST	Yes	
<p><b>Comment:</b> A new terminal would be located just south of the area marked Pier of Stursy on the OS 1:50,000 map. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the site. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans, which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Linga Holm, a small island which lies less than 1 km to the west of the site of the proposed terminal, is owned by the Scottish Wildlife Trust and is a breeding and pupping site for grey seal which is listed as a protected species under Annex II of the Habitats Directive. Excavation work and operations requiring the use of cement could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Construction of the terminal and associated marshalling area would require a limited amount of land take and loss of soil environment. Minor impact on geology would be likely due to piling. Construction of the terminal and associated linkspan would cause impact on landscape and relevant features for consideration would include lighting and signage etc. There are no Scheduled Ancient Monuments in the vicinity of the proposed site but when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. Use of primary aggregates and sand would lead to short term negative impact on material assets. Most of these would be sourced locally but some rock might be sourced from outwith the county. The construction work would result in minor increases in background noise.</p>														
<b>2. Construction of access road to relocated Stronsay terminal</b>	# ST	# ST	# ST	# ST	# LT	?	# LT	?	□	□	# ST	# ST	Yes	
<p><b>Comment:</b> Construction work would result in short-term exhaust emissions from vehicles, and slight localised temporary effects are possible from dust. Negative impact would be possible on biodiversity, flora and fauna, e.g. EPS, otter may be in the area, and although the proposed route of the road does not lie within any designated area, the habitats and species present are not known. Excavation work could lead to increased suspended solids in water courses. Construction of the road will require a limited amount of land take and the resulting disturbance to the soil environment. The potential effect on the geology of the area will be unknown until survey work is carried out. Negative impact on landscape would be possible and would depend on width of road and signage etc. Use of primary aggregates would lead to short term negative impact on material assets. Most of these would be sourced locally but some rock might be sourced from outwith the county. The construction work would result in minor increases in background noise.</p>														
<b>3. Dredging of the seabed around the new terminal and its approaches</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes	
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. There would be localised negative impact on benthic fauna and flora as an area of marine substrate would be removed. The sea bed around Linga Sound is not designated and no priority habitats or species are recorded, but its benthic cover is unknown. Dredging could also lead to locally increased levels of suspended solids in the water environment. Disposal of dredge spoil would be necessary. Minor impact on geology would be likely. The potential impact on cultural heritage is uncertain. No protected wrecks are known in this area.</p>														

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<p style="text-align: center;"><b>Options for Stronsay</b></p> <p><b>Option (a) Relocation of Stronsay terminal to Linga Sound</b></p>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>4. Operation of option (a), a ferry service from a terminal relocated to the west coast of Stronsay</b>	✓✓ LT	✓✓ LT	? ?	✓ LT	□	□	□	? ?	✓✓ LT	✓✓ LT	□	✓ LT	No
<p><b>Comment:</b> The results of environmental assessment of Option (a), operation of the ferry service from a relocated Stronsay terminal, identify positive impacts on climate factors and local air quality, these due to the greater efficiency of the new ferry vessel engines and the reduction in route length which relocation of the terminal would allow. Positive impact is also identified on the water environment as a result of the improved storage and/or treatment on board the vessels of fuel and waste water. The benefits of improved connectivity between Stronsay and Kirkwall, Eday and Sanday and the reduction in travelling time at sea would have positive impacts on population and human health factors, and reduced noise would be beneficial both to humans and to the natural environment. Although the proposed location of the new terminal is within 1 km of Linga Holm, which is owned and managed by the Scottish Wildlife Trust as a sanctuary for grey seal, it is unlikely that the operation of the ferry service will have a negative impact on the seal colony.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Rousay, Egilsay and Wyre Cascaded vessel and associated modifications and required works to terminals	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to terminal at Rousay</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> The ferry vessel Shapinsay would be lengthened and cascaded to operate the Rousay, Egilsay and Wyre service. Brinyan pier may be lengthened but modification of the ramp would not be necessary. The construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications could add to impact of pier on local landscape. Rousay contains many Scheduled Ancient Monuments but none of these is in the immediate vicinity of the pier. Impact on cultural heritage is uncertain as in carrying out construction there is potential for negative impact to undiscovered archaeological remains. Use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work may result in minor background noise.</p>													
<b>2. Dredging of seabed around Rousay Pier</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. Extensive maerl beds are known to be present on the seabed between Rousay and Wyre. Maerl is a UK priority habitat and is susceptible to the blanketing effect of suspended solids. An area of <i>Zostera marina</i> is also present off the eastern shore of the neighbouring island of Eynhallow. Minor impact on geology would be possible. Possible impact on cultural heritage would be uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Disposal of the resulting dredge spoil would be necessary.</p>													
<b>3. Modifications to Egilsay terminal</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> The Egilsay terminal would be extended to accommodate the Shapinsay but the ramp should not require modification. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Operations requiring use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Three aquaculture sites are located in Rousay Sound and may be vulnerable to increased suspended solids. Minor impact on geology would be likely due to piling. Modifications to the pier could add to its impact on the local landscape. There are Scheduled Ancient Monuments in Egilsay but none of these is in the immediate vicinity of the pier. However, impact on cultural heritage would be uncertain. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Rousay, Egilsay and Wyre Cascaded vessel and associated modifications and required works to terminals	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>4. Dredging of seabed around Egilsay Pier</b>	# ST	☐	# ST	# ST	☐	# LT	☐	?	☐	☐	☐	☐	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. Extensive maerl beds are known to be present on the seabed immediately to the north of the pier and across the Sound between Egilsay and Rousay. Maerl is a UK priority habitat and is susceptible to the blanketing effect of suspended solids. Three aquaculture sites are located in Rousay Sound and may also be vulnerable to increased suspended solids. Minor impact on geology would be possible. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Disposal of the resulting dredge spoil would be necessary.</p>													
<b>5. Modifications to Wyre terminal</b>	# ST	# ST	# ST	# ST	☐	☐	✓ LT	?	☐	☐	# ST	# ST	Yes
<p><b>Comment:</b> At Wyre the dog-leg extension would be removed from the end of the pier to allow improved ease of access to the larger vessel. Construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Modifications to the pier could have positive impact on the local landscape. There are Scheduled Ancient Monuments in Wyre but none of these is in the immediate vicinity of the pier. However, impact on cultural heritage is uncertain as when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The construction work would result in minor increases in background noise.</p>													
<b>6. Dredging of seabed around Wyre Pier</b>	# ST	☐	# ST	# ST	☐	# LT	☐	?	☐	☐	☐	☐	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. Extensive maerl beds are known to be present on the seabed between Rousay and Wyre. Maerl is a UK priority habitat and is susceptible to the blanketing effect of suspended solids. An area of <i>Zostera marina</i> is also present off the eastern shore of the neighbouring island of Eynhallow – which is surprising as the waters surrounding Eynhallow are characterised by very strong tidal flows. Minor impact on geology would be possible. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains, however no protected wrecks are known in this area. Disposal of the resulting dredge spoil would be necessary.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<p align="center"><b>Rousay, Egilsay and Wyre</b></p> <p align="center"><b>Cascaded vessel and associated modifications and required works to terminals</b></p>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
7. Operation of service to Rousay, Eday and Wyre	# ST	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	?	✓ LT	✓ LT	<input type="checkbox"/>	<input type="checkbox"/>	No
<p><b>Comment:</b> Deployment of the larger vessel would result in increased exhaust emissions until the Shapinsay is ultimately replaced by a new vessel. The increase deck capacity should result in positive impact on the island's population and the vessel's greater size should result in a more comfortable crossing for passengers.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<p style="text-align: center;"><b>Shapinsay</b></p> <p style="text-align: center;"><b>Cascaded vessel and associated modifications and required works to terminal</b></p>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Modifications to terminal at Shapinsay</b>	# ST	# ST	# ST	# ST	□	# LT	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> The ferry vessel, Hoy Head would be cascaded to operate the Shapinsay service. The linkspan would be relocated to the opposite side of the pier and the pier would be lengthened. Construction work would result in short-term exhaust emissions from vehicles, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications to the pier could add to its impact on the local landscape. Balfour Castle, its grounds and the village come under a Gardens and Designed Landscapes designation and Balfour village is an Urban Conservation Area. There are no Scheduled Ancient Monuments in the immediate vicinity of the pier but Balfour Castle and many buildings in the village are listed. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise.</p>													
<b>2. Dredging of seabed around Shapinsay Pier</b>	# ST	□	# ST	# ST	□	# LT	□	?	□	□	□	□	Yes
<p><b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. No priority habitats or species are recorded in the vicinity of the pier but tide-swept <i>Modiolus modiolus</i> beds and maerl beds are located to the east in Shapinsay Sound and there is an extensive area of maerl in Wide Firth to the west of Shapinsay. These are species/habitats which would be vulnerable to the blanketing effect of suspended solids and therefore to the dumping of dredge spoil. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. Aquaculture farms are located in Carness Bay and Bay of Meil nearby and may be vulnerable to increased suspended solids. Minor impact on geology would be possible. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. No protected wrecks are known in this area. Porpoises are known to pass through 'The String', the strongly tidal channel which separates Shapinsay from the Mainland.</p>													
<b>3. Operation of the Shapinsay service</b>	# ST	□	□	□	□	□	□	?	✓ LT	✓ LT	□	□	No
<p><b>Comment:</b> Deployment of the larger vessel would result in increased exhaust emissions until the Hoy Head were ultimately replaced by a new vessel. The increase deck capacity should result in positive impact on the island's population and the vessel's greater size should mean fewer sailings are cancelled due to adverse weather conditions and should result in a more comfortable crossing for passengers.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Graemsay and Moaness Stretch Graemsay vessel and associated modifications to Graemsay terminal	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
1. Modifications to terminal at Graemsay	# ST	☐	☐	# ST	☐	☐	?	?	☐	☐	# ST	☐	Yes
<p><b>Comment:</b> There will be slight modification of the pier at Graemsay, involving construction of either a small ramp or landing platform, to allow landing of heavy goods either side of High Water. Works requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Graemsay lies within the National Scenic Area but it is not considered that the proposed modification to the pier would have any detrimental effect on the landscape of the area. However a formal assessment would be necessary. Potential impact on cultural heritage interests is uncertain. The increased capacity of the ferry vessel and the proposed facility for unloading heavy goods is expected to have a positive impact on the population of the island. The use of primary aggregates and sand would lead to short term slight negative impact on material assets, most of which would be sourced locally. There will be no requirement for dredging to be carried out at the Graemsay pier.</p>													
2. Operation of the service between Graemsay and Moaness	# LT	☐	☐	☐	☐	☐	☐	☐	✓ LT	✓ LT	☐	☐	No
<p><b>Comment:</b> Plans are currently under way to lengthen the ferry vessel Graemsay in order to increase its deck capacity. This will slightly increase the weight of the vessel and its fuel usage (and therefore its emissions). The increased capacity of the ferry vessel and the proposed facility for unloading heavy goods is expected to have a positive impact on the population of Graemsay. Modifications will not be necessary to the pier at Moaness, Hoy, as this part of the route will continue to be operated as a passenger only service. The increased capacity of the vessel will also benefit the population of the north of Hoy as it will increase access for residents and will help promote tourism in the area.</p>													



OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<p style="text-align: center;"><b>Hoy and Flotta</b></p> <p style="text-align: center;"><b>Option (b) Cascaded vessel and associated harbour works at Lyness, Flotta and Stromness</b></p>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<p><b>1. Modifications to terminal at Lyness</b></p>	# ST	# ST	# ST	# ST	□	□	# LT	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> Initially the ferry vessel Varagen would be cascaded to operate the Hoy and Flotta service. The Varagen would then be due for replacement three years following the introduction of the new North Isles ferries. At Lyness the linkspan would require to be widened to accommodate the wider vessel but no changes would be necessary to the length of the pier. The construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Modifications to the pier are unlikely to add to its impact on the local landscape as the surrounding landscape is largely developed. A range of Scheduled Ancient Monuments are located at Lyness. These include a diesel pumping station, a steam pumping station and an oil tank dating from the Second World War. However, impact on cultural heritage is uncertain as when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise. Dredging would not be necessary around Lyness pier.</p>													
<p><b>2. The terminal at Longhope</b></p>	□	□	□	□	□	□	□	□	□	□	□	□	No
<p><b>Comment:</b> No modifications will be required to the terminal at Longhope.</p>													
<p><b>3. Modifications to terminal at Flotta</b></p>	# ST	# ST	# ST	# ST	□	# LT	□	?	□	□	# ST	# ST	Yes
<p><b>Comment:</b> At Flotta the linkspan would require to be widened to accommodate the wider vessel and it might be necessary to extend the pier. The construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Cetaceans in particular would be vulnerable to underwater noise resulting from activities such as pile driving. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Minor impact on geology would be likely due to piling. Modifications to the pier are unlikely to result in significant impact on the local landscape as the surrounding area is largely developed due to the presence of the oil terminal. Two Scheduled Ancient Monuments are located in Flotta – the Buchanan Battery and the Stanger Head Battery - but neither is in the immediate vicinity of the pier. However, impact on cultural heritage is uncertain as when carrying out construction work there is potential for negative impact to previously undiscovered archaeological remains. The use of primary aggregates and sand would lead to short term negative impact on material assets, most of which would be sourced locally. The construction work would result in minor increases in background noise.</p>													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
Options for Hoy and Flotta  Option (b) Cascaded vessel, associated harbour works at Lyness and Flotta and re-route to Stromness	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>4. Dredging of seabed around Flotta Pier</b>	# ST	☐	# ST	# ST	☐	# LT	☐	?	☐	☐	☐	☐	Yes
<b>Comment:</b> Dredging operations would result in short-term exhaust emissions from the dredge vessel. Negative impact on benthic flora and fauna would be expected as an area of marine substrate would be altered. No priority habitats are known to be present on the seabed off the north coast of Flotta but its benthic cover is not recorded. Dredging would lead to short-term locally increased levels of suspended solids in the water environment. Minor impact on geology would be possible. The possible impact on cultural heritage is uncertain as dredging operations have potential to disturb underwater archaeological remains. The wreck of HMS Vanguard lies off the north shore of Flotta and is protected under the Orkney Harbour Byelaws 1977 which prohibit diving on the wreck.													
<b>5. Modifications to terminal at Stromness</b>	# ST	# ST	# ST	# ST	☐	?	?	?	☐	☐	# ST	# ST	Yes
<b>Comment:</b> It may be necessary to modify the existing linkspan at Stromness. The construction work would result in short-term exhaust emissions from vehicles and machinery, and slight temporary effects would be possible from dust in the immediate vicinity of the pier. Negative impact would be possible on biodiversity, flora and fauna, e.g. European Protected Species otter and cetaceans which may be present in the area. Cetaceans are especially vulnerable to underwater noise. Operations requiring the use of cement and aggregates could lead to increased suspended solids in the water environment. Changes to water movement and sediment transport would be possible as a result of terminal development. Stromness is part of a National Scenic Area but it is not considered that the proposed modification to the pier will have any detrimental effect on the landscape of the area. However a formal assessment would be necessary. The construction work would result in minor short term impact on material assets and may result in minor background noise. The construction work would result in minor short term impact on material assets and may result in minor background noise.													
<b>6. Operation of the service between Stromness, Lyness and Flotta</b>	# ST	☐	☐	☐	☐	☐	☐	?	✓ LT	✓ LT	☐	☐	No
<b>Comment:</b> The Varagen is larger than the present ferry, the Hoy Head, so its fuel usage (and therefore its emissions) will be higher. The Hoy Head can presently carry 14-16 cars, whereas the Varagen can carry 30 cars. The increased capacity and deck space is expected to have a positive impact on the populations of Hoy and Flotta. The sea journey to Stromness would be ten minutes longer than the journey to Houton and the bus journey from Stromness to Kirkwall would also be ten minutes longer than the journey from Houton to Kirkwall. However, it is possible that people would choose to shop and carry out much of their business in Stromness rather than in Kirkwall, thus benefiting the town of Stromness. The Varagen is due for replacement three years after the cascade and a further option could be to replace the Varagen with a medium speed catamaran which would have similar power output to the Varagen, and would use a similar quantity of fuel but would be cleaner due to its modern, more efficient engines.													

OBJECTIVE/ COMPONENT OF PPS	ASSESSMENT CRITERIA												
<b>Air Service</b>  <b>Option (c)</b>	Climatic factors	Local air quality	Biodiversity, flora & fauna	Water	Soil	Geology	Landscape	Cultural Heritage	Population	Human health	Material assets	Noise	Mitigation required?
<b>1. Rationalise air service network, focusing on lifeline connections where particular needs are not met by the ferry operation.</b>	<input checked="" type="checkbox"/> <b>LT</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>#</b> <b>LT</b>	<b>?</b>	<input checked="" type="checkbox"/> <b>LT</b> <b>#</b> <b>LT</b>	<input checked="" type="checkbox"/> <b>LT</b> <b>#</b> <b>LT</b>	<b>#</b> <b>ST</b>	<input type="checkbox"/>	<b>Yes</b>
<p><b>Comment:</b> Under this option the air service would focus on those connections which are not fully satisfied by the ferry service alone. Depending on the nature of the ferry service option variants that are taken forward, attention is likely to focus on North Ronaldsay and, perhaps, Papa Westray. A focus on these links could see an enhancement in the connections, in terms of timings, capacity or airstrip lighting. Positive impact on climate factors could be expected in the event of a reduction in the air service. Installation of lighting at airstrips could have negative impact on landscape whilst in operation. Positive impact would be expected on the population and aspects of the residents' health of those islands which continue to be served by the air service as they would continue to have rapid access to services and facilities on the mainland of Orkney. Conversely, a degree of negative impact may be experienced by the residents of the islands where the air service becomes less frequent. If lighting were installed this could also lead to short term use of material assets.</p>													

**STRATEGIC ENVIRONMENTAL ASSESSMENT OF THE ORKNEY ISLANDS INTER-ISLES CONNECTIVITY STRATEGY**  
**APPENDIX F: Summary of the Assessment of Cumulative Effects of the Strategy**

**Table 14: Assessment of cumulative effects**

SEA topic	Orkney Islands Inter-isles Connectivity Strategy Individual Projects																										Cumulative impact				
	N. Ronaldsay Option (a)		P. Westray Option (b)		Westray Option (a)		Eday Option (a)		Sanday Option (a)		Stronsay Option (a)		Rousay		Egilsay		Wyre		Shapinsay		Graemsay & Moaness		Hoy		Flotta			Stromness Option (b)		Air	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2		1	2	1	2
Climate factors	-ST	+LT	-ST	+LT	-ST	+LT	-ST	+LT	-ST	+LT	-ST	+LT	-ST	-ST	-ST	-ST	-ST	-ST	-ST	-ST	-ST	-ST	-ST	-ST	-ST	-ST	-ST	-ST	-ST	+LT	Short term negative impacts at all locations due to construction work on piers, dredging and also road construction in Stronsay. Long term positive impacts predicted from introduction of new, fully compliant ferry vessels and replacement of direct Papa Westray to Kirkwall route by shorter Papa Westray to Pierowall route. Short term negative impacts are forecast where larger vessels from the present fleet would be cascaded to replace smaller vessels.
Air quality	-ST	+LT	-ST	0	-ST	+LT	-ST	+LT	-ST	+LT	-ST	+LT	-ST	0	-ST	0	-ST	0	-ST	0	0	0	-ST	0	-ST	0	-ST	0	0	0	Minor short term negative impacts at all locations due to construction works of piers and road works on Stronsay. Positive impacts predicted from introduction of new ferries.
Biodiversity flora & fauna	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	?	-ST	0	-ST	0	-ST	0	-ST	0	0	0	-ST	0	-ST	0	-ST	0	0	0	Short term negative impacts at all locations due to construction work on piers, dredging and road construction on Stronsay.
Water	-ST	+LT	-ST	0	-ST	+LT	-ST	+LT	-ST	+LT	-ST	+LT	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	0	0	Short term negative impacts at all locations due to construction work on piers, dredging and road construction on Stronsay.
Soil	0	0	0	0	0	0	0	0	0	0	-LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Only negative impact in Stronsay due to land take for access road and terminal marshalling area.	
Geology	-LT	0	-LT	0	-LT	0	-LT	0	-LT	0	-LT	0	-LT	0	-LT	0	-LT	0	-LT	0	0	0	0	0	0	-LT	0	?	0	0	Long term minor impact on geology due to pile driving operations associated with pier extensions, and also to dredging of the seabed.
Landscape	-LT	0	?	0	-LT	0	-LT	0	-LT	0	-LT	0	-LT	0	-LT	0	+LT	0	-LT	0	?	0	-LT	0	0	0	?	0	0	-LT	Long term negative impact possible at most locations due to pier extensions and new terminal and access road in Stronsay. Impact of ramps at Pierowall and Moclett uncertain.
Cultural heritage	?	0	?	0	?	0	?	0	?	0	?	0	?	0	?	0	?	0	?	0	?	0	?	0	?	0	?	0	?	0	Impact on cultural heritage is uncertain but it is acknowledged that there is potential during excavations and construction work for damage to occur to archaeological remains.
Population	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	Overall positive impacts anticipated on the populations of all islands. Potential for negative impact where air provision may be reduced to certain islands.
Health	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	0	+LT	Overall positive impacts anticipated on health of the residents of all islands. Some negative impact where air provision may be reduced to certain islands.
Material assets	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	-ST	0	Short term negative impact on material assets due to proposed work on transport infrastructure projects.
Noise	-ST	+LT	0	0	-ST	+LT	-ST	+LT	-ST	+LT	-ST	+LT	-ST	0	-ST	0	-ST	0	-ST	0	0	0	-ST	0	-ST	0	-ST	0	0	0	Short term negative impact on noise at locations where blasting is required and where pier extensions will be built. Also on Stronsay during construction of new terminal and road. Long term positive impact is anticipated as a result of quieter engines in proposed new ferries. On Stronsay, the site of the proposed terminal is presently undeveloped, so slight increase to present noise level is expected.
Inter-relationship	In marine and coastal environments, the sea and the biodiversity, flora and fauna which live within and around it are closely inter-related and interdependent.																														

**KEY**  
 1 = Construction works; 2 = Operation of service  
 +LT = positive long term environmental impact    -LT = long term negative environmental impact    0 = no environmental impact    ? = impact uncertain    -ST = short term negative environmental impact