

Strategic Environmental Assessment of Supplementary Guidance Aquaculture (2017)

Appendix B: Environmental baseline

1. Biodiversity and Geodiversity

Orkney has a rich and varied natural heritage which includes internationally, nationally and locally designated sites, species that are protected through legislation and also the wider biodiversity and geodiversity.

International sites include Special Protection Areas (SPA) and Special Areas for Conservation (SAC) which are designated under the EC Birds and Habitats Directives as part of the EU Natura 2000 network; these sites are strictly protected. The same level of protection is afforded in the UK to wetland sites, known as Ramsar sites, which are designated as internationally important for birds under the 1971 Convention on Wetlands.

In Orkney there are thirteen SPAs, six SACs and one Ramsar site. Seven SPAs in Orkney include marine areas that are important to breeding seabirds for essential resting and maintenance activities. Work is ongoing throughout the UK to identify a suite of wholly marine SPAs, and the following areas within Orkney waters are currently identified as proposed SPAs:

- North Orkney
- Scapa Flow
- Pentland Firth

Nationally protected sites include the Sites of Special Scientific Interest (SSSI). The boundaries of SSSIs do not extend below Mean Low Water Springs; nonetheless there is potential for aquaculture development to have an effect upon the qualifying interests of sites either directly or indirectly, e.g. where these qualifying interests include seals or certain bird species.

The Marine (Scotland) Act 2010 established a new power for Marine Protected Areas (MPAs) in the seas around Scotland, to recognise features of national importance and to meet international commitments for developing a network of MPAs. SNH has undertaken reviews of a large number of marine habitats and species in order to identify those it considers to be of greatest marine nature conservation importance in Scottish territorial waters – these are termed Priority Marine Features (PMFs). The list of Priority Marine PMFs can be accessed from the SNH website at <http://www.snh.gov.uk/protecting-scotlands-nature/priority-marine-features/> A subset of the PMFs has been used to underpin the selection of Nature Conservation MPAs. There are two NC MPAs in Orkney waters – Wyre and Rousay Sounds and Papa Westray.

Many PMFs are already included in the UK Biodiversity Action Plan (UKBAP), as well as the Scottish Biodiversity List which was compiled to help public bodies carry

out their Biodiversity Duty, by identifying the species and habitats which are the highest priority for biodiversity conservation in Scotland.

PMFs which occur locally include benthic habitats such as horse mussel beds, maerl beds and seagrass beds as well as species such as common and grey seal, ocean quahog and the flame shell. Information on the distribution of Priority Marine Features in Orkney waters is available in Scotland's Marine Atlas which may be accessed at <http://www.scotland.gov.uk/Publications/2011/03/16182005/0>.

The sea trout *Salmo trutta*, listed on the UKBAP and Scottish Biodiversity List, is one of the species included on the list of PMFs. In common with other salmonids, sea trout are vulnerable to infection by sea lice, in particular the salmonid-specific *Lepeophtheirus salmonis*. Studies have demonstrated a spatial link between fin fish farming and increased levels of sea lice infection in wild salmonid species. Recognising the increased vulnerability of juvenile sea trout as they enter the marine environment from spawning burns, the Orkney Trout Fishing Association has undertaken a survey to identify the main sea trout spawning burns in Orkney. A summary of the sea trout survey, including a list of sea trout spawning burns may be accessed at http://www.orkneytroutfishing.co.uk/envirionment/e_seatroutsurvey.html.

A suite of draft Local Nature Conservation Sites (LNCS) has been identified as being of local importance to wildlife or exhibiting features of local natural heritage interest. Although these are predominantly in terrestrial locations, a number are in the intertidal area. Site statements for each LNCS have been prepared and these are available in the Orkney Local Development Plan Supplementary Guidance Natural Environment Annex 1 which may be accessed from the OIC website at <http://www.orkney.gov.uk/Service-Directory/R/natural-heritage.htm>

The boundaries of Orkney's Natura 2000 sites, Ramsar site, SSSIs and NC MPAs are included in the Orkney Local Development Plan Proposals Maps.

The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) enact the provisions of the Habitats Directive. Schedule 2 of the Regulations identifies European Protected Species (EPS) which are afforded the highest level of legal protection available under European and UK legislation. EPS which may be found in the marine environment of Orkney and are of relevance to aquaculture include European otter, any cetacean species and any species of marine turtle.

Basking shark is listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and is protected against intentional or reckless disturbance or harassment.

SNH Commissioned Report 419: Abundance and behaviour of cetaceans and basking sharks in the Pentland Firth and Orkney Waters provides further information on the distribution of these species and may be accessed at <http://www.snh.gov.uk/publications-data-and-research/publications/search-the-catalogue/publication-detail/?id=1875>

Lists of species that are protected in Scotland, along with information on the legislation which gives protection, can be accessed from the Scottish Natural

Heritage website at <http://www.snh.gov.uk/protecting-scotlands-nature/protected-species/which-and-how/>.

Stocked cages attract wild predators, which may include seals and certain bird species, and for this reason information on the distribution of these species is an important factor in the selection of new aquaculture sites.

Recent figures show that harbour seal numbers around Scotland as a whole are declining. The decline was first noticed in the Northern Isles and the east coast and the latest results confirm that the harbour seal populations of Orkney, Shetland and the Firth of Tay continue to decrease. So far the Moray Firth population appears to have stabilised and the west coast of Scotland and the Outer Hebrides population does not appear to show the same dramatic decline as the Northern Isles. In August 2010 SNH commissioned a survey of harbour (common) seals in Orkney, the results of which are available at <http://www.snh.gov.uk/publications-data-and-research/publications/search-the-catalogue/publication-detail/?id=1762>. The reason for the decline is not yet clear, since harbour seals have declined and grey seals have not. There have been no obvious signs of disease in the harbour seal population and therefore the decline is thought to be due to a combination of factors including climate change (particularly the effect on the seals' prey such as sandeels), competition between species for reduced amounts of prey, predation (for example from killer whales), pollution and shooting.

The Marine (Scotland) Act 2010 provides for improved protection of seals by making it an offence to kill or take seals at any time. The Act allows exceptions only under specific licence or for animal welfare and introduces a new offence of harassment of seals at listed haul-out sites (Scottish Government, 2011). Details of designated haul-out sites on the coastlines of Orkney may be accessed at <http://www.gov.scot/Topics/marine/marine-environment/species/19887/20814/maps>. Further information on seals and licensing is available from the Scottish Government website at <http://www.scotland.gov.uk/Topics/marine/Licensing/SealLicensing>.

The Act also provides for Scottish Ministers to designate "seal conservation areas". The areas previously covered by the Conservation of Seal (Scotland) Orders namely Shetland, Orkney, the Moray Firth and the East Coast of Scotland have been transcribed into seal conservation areas. Marine Scotland must not grant a seal licence authorising the killing or taking of seals in a seal conservation area unless they are satisfied that there is no satisfactory alternative way of achieving the purpose for which the licence is granted, and that the killing or taking authorised by the licence will not be detrimental to the maintenance of the population of any species of seal at a favourable conservation status in their natural range (within the meaning of Article 1(e) of the Habitats Directive).

A number of fish and shellfish-eating bird species, including cormorant and eider, are found around the coasts of Orkney. Breeding cormorant is one of the qualifying species of the Calf of Eday SPA and another large colony is located on Boray Holm, to the south of Gairsay. Eider is widespread in Orkney but particularly large aggregations are found in the vicinity of Rousay Sound. Non-breeding common eider is one of the qualifying species of both the North Orkney pSPA and the Scapa Flow pSPA.

The Orkney Local Biodiversity Action Plan (2002) provides descriptions and other useful information on selected priority marine habitats and Version 1.2 of the LBAP which was published in 2013 includes lists of priority species and habitats which appear on the UK Biodiversity Action Plan and/or the Scottish Biodiversity List.

Water

All aquaculture developments rely on high water quality and a degree of tidal flushing. In inshore marine locations it is important to select sites with good water exchange characteristics where tidal currents can disperse waste materials, maintaining well-oxygenated conditions and, in the case of shellfish cultivation, providing adequate supplies of planktonic food organisms.

Fish farm cage sites impact upon the seabed, for example by smothering with carbon from waste feed and faecal material and through chemical toxicity, for instance due to deposition of sealice therapeutants and antifoulant agents from nets. The inputs from shellfish farms to the water column are usually minimal as shellfish feed on marine plankton and no additional feed is required. However, where very large scale shellfish farms are proposed, water column and benthic (seabed) impacts may need to be considered.

In order to achieve improvements to water quality, the Water Framework Directive requires member states to identify River Basin Districts and to establish River Basin Management Plans. Most of Scotland is within the Scotland river basin district, which is covered by the Scotland River Basin Management Plan (RBMP). Key objectives of the Scotland RBMP are that the water quality and overall status of water bodies achieve a good or high status, and that there is no deterioration in current status. The water quality and overall status of coastal waters in and around Orkney is currently classified as being at either good or high. Further information on water classification is available from Scotland's Environment Web which can be accessed at <http://www.environment.scotland.gov.uk/>.

The "Locational Guidelines for the Authorisation of Marine Fish Farms in Scottish Waters" categorise sea lochs, voes and embayments into 3 Categories based on predictions of the impacts from the existing scale of development and can be accessed at <http://www.gov.scot/Resource/0049/00497652.pdf>. Models predicting the nutrient enhancement of the water column and the proportion of sea bed likely to be degraded are used to identify areas more likely to be able to support additional farmed fish biomass. Currently, no further increases in maximum biomass are permitted in Category 1 areas. Increases are more likely to be permitted in Category 2 and 3 areas (subject to site specific assessment through EIA and CAR).

There are two Category 3 areas in Orkney; these are located at Kirk Hope and Pierowall Bay. The remainder of Orkney waters have not been categorised as they are more open than in other parts of Scotland.

Shellfish Water Protected Areas (SWPA) are regulated by European legislation through the River Basin Management Planning framework in order to support shellfish life and growth, contributing to the high quality of edible shellfish products and also to protect shellfish growing waters against pollution and, where necessary,

establish programmes to reduce pollution. Currently, one area of coastal waters in Orkney is designated as a SWPA - the Bay of Firth. A map showing the extent of this area may be accessed from the Scottish Government website at <http://www.gov.scot/Resource/0043/00439141.pdf>.

Geology and sediments

A number of coastal sites are nationally designated on account of their geological or geomorphological value. These include the Central Sanday SSSI which is notified for its outstanding mix of blown sand and shingle landforms. In the marine environment the Wyre and Rousay Sounds and Papa Westray NC MPAs both lie within the Orkney carbonate production area, an internationally important example of a non-tropical shelf carbonate system. Further information on these sites is available from the SNH website at http://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=10412. There are also a number of coastal Geological Conservation Review sites, some of which are designated as Local Nature Conservation Sites. The full list of Orkney's GCR sites may be accessed from the JNCC website at <http://jncc.defra.gov.uk/default.aspx?page=4177&authority=UKM45>

Landscape

With their extensive and varied coastlines, the Orkney Islands feature a wide range of landscapes and seascapes, each with its own capacity to accommodate new development. A number of publications relating to the landscape of Orkney are available from the SNH website. These include:

The Orkney Landscape Character Assessment (1998)

<http://www.snh.gov.uk/publications-data-and-research/publications/search-the-catalogue/publication-detail/?id=299>

Orkney Landscape Capacity for Aquaculture: Scapa Flow and Wide Firth (2011)

<http://www.snh.gov.uk/publications-data-and-research/publications/search-the-catalogue/publication-detail/?id=1827>

Coastal character assessment: Orkney and North Caithness (2016)

<http://www.snh.gov.uk/mwg-internal/de5fs23hu73ds/progress?id=mVBwvMAx3i4LoZF57z5yUnbxADpkCLqi9RiP82IKwWU>

Scotland's National Scenic Areas (NSA) are areas which are considered to be of national significance on the basis of their outstanding scenic interest, and which must be conserved as part of the country's natural heritage. The Hoy and West Mainland NSA, which extends to 14,800 hectares, is the only part of Orkney to hold this designation. A description of the Hoy and West Mainland NSA and its special qualities may be accessed from the Scottish Natural Heritage website at <http://gateway.snh.gov.uk/sitelink/index.jsp>.

An area within Hoy is identified for its wild character. Further information on this area is available on the SNH website at <http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/landscape-policy-and-guidance/wild-land/mapping/>

Cultural heritage

Orkney has a rich and diverse cultural heritage, much of which has a close association with the coastal and marine environments.

Many of the islands' Scheduled Monuments (SMs) have a coastal setting and these include a number of sites which are popular tourist attractions. The remains of many ship wrecks are located in the marine environment around Orkney's extensive coastlines. These include vessels of the German fleet which were scuttled in Scapa Flow following the end of World War I and are now designated as SMs:

- Brummer
- Coln
- Dresden
- Karlsruhe
- Konig
- Markgraf
- Kronprinz Wilhelm

The sites of a further three naval wrecks are designated as war graves. These include the resting places of HMS Hampshire which hit a mine in 1916 and sank off Marwick Head in Birsay, and HMS Vanguard which sank in 1917 off Flotta following an explosion and fire on board. In 1939 at the beginning of World War II HMS Royal Oak was torpedoed by a German U-boat as she lay at anchor and her remains lie on the seabed close to the eastern coastline of Scapa Flow.

Historic sites such as brochs and burial chambers are commonly found in coastal locations, and sea level rise following the end of the ice age means that further submerged archaeological resources are known to be present in certain offshore locations. There is potential for submerged landscapes to persist, with the potential for this lowest in current swept areas. Consultation with the County Archaeologist has identified the potential for these features in 5m or less in depth, subject to the depositional and erosional history of the seabed. In deeper waters the sea bed has potential to contain information related to the post-glacial inundation of Orkney. Further information on unscheduled archaeology, wrecks and underwater sites is available from Orkney Council's own archaeology service. Data on nationally designated heritage assets can be downloaded from Pastmap, Historic Environment Scotland's Data Services Website at: <https://www.historicenvironment.scot/archives-and-research/archives-and-collections/pastmap/>.

Conservation Areas and Listed Buildings will not normally be affected directly by aquaculture development but their setting may be impacted if the buildings or conservation area have a coastal position. There are four Urban Conservation Areas in Orkney, in Kirkwall, Stromness, St Margaret's Hope and Balfour, Shapinsay, all of which have a coastal boundary. The island of Eynhallow and the Inner Zone of Visual Influence of the Heart of Neolithic Orkney World Heritage Site at Brodgar are Rural Conservation Areas. The latter does not have a coastal boundary and will not be affected by aquaculture development.

Listed buildings can also be found in locations outside Conservation Areas and many have a coastal setting which may be affected by aquaculture development.

Historic gardens and designed landscapes represent a further element of the historic environment which requires protection. There are three such sites in Orkney – at Melsetter House, Hoy; Balfour Castle, Shapinsay and Skail House, Sandwick.

The Marine (Scotland) Act 2010 has established a new power for Marine Protected Areas (MPAs) in the seas around Scotland, to recognise features of national importance and to meet international commitments for developing a network of MPAs.

The Act allows for three different types of MPAs to be set up:

- Nature Conservation MPAs
- Demonstration and Research MPAs
- Historic MPAs

Historic Scotland is working with Marine Scotland, Scottish Natural Heritage, and the Joint Nature Conservation Committee on the Scottish Marine Protected Areas Project, to make recommendations to Scottish Ministers on the development of a network of MPAs in the seas around Scotland.

The Heart of Neolithic Orkney World Heritage Site represents an important part of Orkney's cultural heritage and is spread over two areas. The Ring of Brodgar, Maeshowe burial chamber and the Stones of Stenness are all located in the parish of Stenness where they are remote from the marine environment. The Neolithic village of Skara Brae is located in the parish Sandwick, on the shores of Orkney's western coastline at the Bay of Skail; however due to the high level of exposure along this coast it is highly unlikely that this area would be considered for aquaculture development. However, for reasons of completeness and consistency the WHS has been included in this environmental baseline.

Population

The population of Orkney is currently approximately 21,670 (mid-year estimate 30 June 2015). Further details of population statistics from the Orkney Islands Council Area Demographic Factsheet may be accessed from the National Records of Scotland website at <https://www.nrscotland.gov.uk/files/statistics/council-area-data-sheets/orkney-islands-factsheet.pdf>

Of the 70+ islands that make up this archipelago, 19 are inhabited with the highest population living in the largest of these, the Mainland. The smaller Isles are located to the north and south of the Mainland and of these the most populated is Westray. The smallest populated Isle is Papa Stronsay which, since 1999, has been the location of the Golgotha Monastery and home to a group of Transalpine Redemptorist priests and monks.

The land area of the Orkney Islands is approximately 990 km² and its coastlines extend to over 980 km in total.

Orkney's coastlines and marine environment are important in terms of their amenity and recreational value. Its many sandy beaches are enjoyed by people of all ages and the County's extensive network of pathways includes a number of recognised coastal walks. The coastal and marine environment is also extensively used by a range of formal recreation groups for activities which include sport diving, sea angling and canoeing. Further information on the Orkney Core Paths Plan, as well as a full set of maps may be accessed from the Council's website at <http://www.orkney.gov.uk/Service-Directory/C/Core-Paths-Plan-and-Maps.htm>.

Material assets

Port infrastructure

The towns of Kirkwall and Stromness each provide a wide range of port facilities, as well as the nearby industrial estates at Hatston and Garson. Each of the inhabited Isles also has pier facilities, in some cases in multiple locations, along with varying levels of ancillary harbour and storage facilities. Further information is available in the Ports Handbook for Orkney which may be accessed from the Council's Marine Services website at: <http://www.orkneyharbours.com>.

Waste

In line with the waste hierarchy, developers are encouraged to reduce, re-use and recycle waste with disposal as a final option. Historically there have been waste issues associated with the aquaculture industry in Orkney. Some of these have been resolved as fish feed is now delivered in tonne bags rather than 25kg bags as was previously the practice, and the industry now sends these bags south for recycling.

Current commercial usage of the marine environment

The aquaculture industry is already well established in Orkney and a number of areas are currently leased for development. Information on finfish sites which are currently active may be accessed from the Scotland's Aquaculture website at http://aquaculture.scotland.gov.uk/map/map.aspx?postcode=Orkney&layers=AQUA_1,AQUA_6.

Other commercial users of Orkney waters include the local inshore fishing industry. Brown crab, lobster, velvet crab and king scallop are the main fisheries, along with smaller fisheries for queen clam, prawn and razor fish (spoots).

Energy

Talisman Energy operates the oil terminal on the island of Flotta where bulk tankers routinely call to load with crude oil.

Occasional ship to ship transfers of oil are carried out in Scapa Flow.

Development of the marine renewable energy industry is also underway with areas leased for research and development, as well as for commercial usage. These are mapped on the Crown Estate website as <http://www.thecrownestate.co.uk/estates-map/map?lat=55.75&long=-4.0&zoom=6>.

The European Marine Energy Centre (EMEC) operates a number of wave and tidal test sites in Orkney waters. The largest of these are the Billia Croo wave energy test site off the west coast of the mainland and the Fall of Warness tidal energy test site off the west coast of Eday. A scale wave test site is located in Scapa Flow, off Howequoy Head with a scale tidal test site in Shapinsay Sound, off the Head of Holland.