THE STATE OF THE EAST GRAMPIAN COAST












East Grampian Coastal Partnership

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DECEMBER 2009

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A SUMMARY OF FINDINGS

This summary condenses the findings of the State of the East Grampian Coast report into a quick, user friendly tool for gauging the state or condition of the aspects and issues included in the main report. The categories good, satisfactory or work required are used as well as a trend where sufficient data is available. A justification for each state is also given. Further information can be obtained by referring to the relevant section in the report.

STATE:

Good Satisfactory Work required

TREND:

Increasing No change Decreasing ? Unknown

TREND CONFIDENCE:

Confidence in the statements made, from the information available

0 No assessment possible **I** Low **II** Good **III** High

ASPECT	STATE	TREND	CONFIDENCE	DESCRIPTION
COASTAL MANAGEMENT				
	■	↑	II	There is much legislation relating to the protection of the marine and coastal environment. The management of the coast however, is underpinned by its ownership, and falls to the Crown Estate and Local Authorities as well as local coastal partnerships and management tools such as ICZM, EIA and designations. This approach is not seen as an efficient way of managing the coast and a reform will take place through the forthcoming Marine (Scotland) Bill.
SOCIETY				
Age Profile	■	?	0	The East Grampian coastal zone has a varied age profile with no major differences when compared to the Scottish average. The area has a slightly higher percentage of people in the 16–44 age groups, levelling out in the 45–59 year olds group and a lower percentage of older (60+) people. *This aspect is classified as good as it is consistent with the Scottish average.*
Economic Status	■	?	0	The economic status of the population of the East Grampian coast is encouraging. A larger proportion of the local population is economically active when compared to Scotland and consequently fewer are either economically inactive or unemployed. *This aspect is classified as good as it is favourable when compared with the Scottish average.*
Diversity of Employment	■	?	0	Many of the local industries support similar percentages of the population as they do across Scotland. The main industries of employment for the area include: health and social work; manufacturing; real estate, renting, business activities; and wholesale and retail trade repairs. The more traditional industries employ relatively few numbers. *This aspect is classified as good as it is consistent with the Scottish average.*
Distance to Work	■	?	0	The distance travelled to work by the local population compares favourably with Scotland as a whole; 77% travel less than 10km, compared to Scotland where on average people travel 12km. *This aspect is classified as good as it is consistent with the Scottish average.*

ASPECT	STATE	TREND	CONFIDENCE	DESCRIPTION
Qualification Level	■	?	0	There are significantly fewer people with no qualifications in this area when compared to Scotland as a whole. For each of the qualification levels including degree level the East Grampian coastal area outperforms the Scottish average. *This aspect is classified as good as it is compares favourably with the Scottish average.*
Education	■	?	0	School exam attainment in Aberdeen City and Aberdeenshire as a whole, is high compared to Scottish averages; Aberdeenshire is one of the better performing local authorities in Scotland. The information is not available at output area level so could not be calculated for the East Grampian coast. *This aspect is classified as satisfactory as it is compares favourably with the Scottish average, however further information would allow an assessment to be made of the East Grampian coast.*
Income	■	?	0	Income in the area is among some of the highest in the UK, with the top 20% earning on average £804.40 per week. There is a large divide between the highest and lowest earners however, with the lowest 20% earning £328.13 per week. This is also higher than the Scottish average though pockets of deprivation do exist. The information is not available at output area level thus could not be calculated for the East Grampian coast. *This aspect is classified as satisfactory as it is compares favourably with the Scottish average, however further information would allow an assessment to be made of the East Grampian coast.*
Household Deprivation	■	↓	II	The health of the East Grampian population is favourable when compared to Scotland. Fewer people (16.7%) suffer from a long term limiting illness than Scotland as a whole (20.3%). More specific health information is not available at output area level. *This aspect is classified as satisfactory as it is compares favourably with the Scottish average, however further information would allow an assessment to be made of the East Grampian coast.*
Health	■	?	0	The health of the East Grampian population is favourable when compared to Scotland. Fewer people (16.7%) suffer from a long term limiting illness than Scotland as a whole (20.3%). More specific health information is not available at output area level. *This aspect is classified as satisfactory as it is compares favourably with the Scottish average, however further information would allow an assessment to be made of the East Grampian coast.*
Vehicle Ownership	■	?	0	Vehicle dependence is much greater in rural areas than in urban areas, with cars being regarded as essential by many. Up to 89% of households in rural Scotland have access to a car and isolation from services appears to be the strongest determinant. Households in the East Grampian coastal area have more cars as a percentage of the population than Scotland as a whole, which may reflect the rural nature of the area, *thus this aspect is classified as satisfactory.*
Access to Services	■	↓	III	The provision of services is important to rural life especially to those with no access to private transport. The services in the East Grampian coastal area are centred on the main settlements of Fraserburgh, Peterhead, Ellon, Aberdeen and Stonehaven however access to the services is good when compared to other areas of Scotland. A slight falling trend can be seen in the number of services available since 1999. *This aspect is classified as satisfactory due to relatively good access to services.*
Housing	■	↓	III	Despite recent falls elsewhere in the housing market this area is a remaining stronghold. The average price in the last quarter of 2008 saw an increase from £181,587 to £196,088. There has been a reduction in the number of properties on the register. Fraserburgh is the best seaside town in Scotland for increasing property values with a rise of 46% from £69,446 in 2006 to £101,482 in 2007. The average house price has increased by 43% since 2001 and whilst this is good for home owners the high prices make it difficult for first time buyers, *therefore this aspect is classified as satisfactory.*
Road Travel	■	↑	III	Traffic counts take place on the A90 which runs the length of the East Grampian coast. From the counts it can be seen that all locations studied have experienced increases in the numbers of cars and vans in the period 2004-2007. *This aspect has been classified as satisfactory as increasing traffic can have a detrimental effect on the environment though it does show positive signs for the economy.*

ASPECT	STATE	TREND	CONFIDENCE	DESCRIPTION
Traditional Maritime Connections	■	↓	II	The East Grampian coast has long connections to the coastal and marine environment including whaling, fishing, ship building and more recently the oil and gas industry. There is a danger this connection will be lost as fewer rely directly on the sea for employment. *This aspect has been classified as work required because of the loss of maritime connections.*
Public Use of the Coast	■	↑	II	The numbers taking part in coastal events and visiting related attractions has remained constant or in some cases increased greatly since 2000. However, tourism information shows a decrease in the numbers visiting the Aberdeen and Grampian area as a whole with UK residents taking 1.58m tourist trips, staying for 5.61m bednights and spending £297m in the area in 2005. During 2006 this fell to 1.5m tourist trips, 5.3m nights* and £275m spent. *This aspect has been classified as satisfactory as despite an increasing numbers visiting coastal attractions, overall visitor numbers to the area have decreased.*
ECONOMY				
Port Authorities Aberdeen Harbour Port of Peterhead Fraserburgh Harbour	■	↑	III	The East Grampian coast is home to three of the largest ports in the UK and some of the largest in Europe. Each of the ports has reported an increase in business in the period 2004–2006. Main commerce includes servicing the fishing and oil and gas industries; freight; and passenger and vehicle ferries. In some cases high numbers of the population are employed either directly or indirectly by the ports. *This aspect has been classified as good due to the increasing business of the three major ports.*
Sustainability of Community Harbours	■	↓	III	There are 12 harbours along the East Grampian coast, six of which are owned and managed by local communities. These harbours are in various states of repair and the onus of repairs lies with the owners, thus the funding for the works must be raised by the communities themselves. In some cases the repair work needed is of a large scale and unless opportunities are sought, these harbours may be lost as coastal assets. *This aspect has been classified as work required due to the current condition and necessary upgrades needed to maintain these assets.*
North Sea Oil and Gas Oil and Gas Production Sales Workforce Training & Skills	■	↓	II	A decreasing supply of oil and gas from the North Sea and global market conditions have led to increasing prices since 2003. Employment figures have recently risen with employers expecting this to continue in the short term with a high demand for skilled workers, though this may be affected by recent falling prices. There are concerns over the demographics of the work force with an average worker age of 41 years. *This aspect has been classified as satisfactory due to the long term employment figures.*
Fisheries Fisheries Industry Main Species	■	↔	II	The introduction of quotas, decommissioning schemes and a cut in the permitted days at sea has affected the fishing industry. However, the North East tonnage has increased since 1995, with the ports contributing 52.5% and 36.5% respectively of all Scottish and UK landings. A number of the target species for east coast vessels have been identified as 'at risk' by IUCN and ICES, whilst insufficient information exists for other species to determine their status. *This aspect has been classified as satisfactory due to the recent stability in the industry.*
Coastal and Offshore Renewable Energy Production	■	↔	II	The East Grampian coast presently has no coastal and offshore energy production although this may change in the future. The Scottish Government are committed to producing 20% of Scotland's energy requirements from renewable sources by 2020. Given the mean wave and tidal power in the area it is unlikely there will be much in the way of related development. However, this area is ideally suited for energy generation from offshore windfarms, with a major planning application submitted for Aberdeen Bay. *This aspect has been classified as work required as renewable energy developments will provide new job opportunities and help diversify the economy of the NE and should be encouraged.*

ASPECT	STATE	TREND	CONFIDENCE	DESCRIPTION
ENVIRONMENT				
Coastal Geomorphology and Biodiversity Coastal Dune Systems	■	?	0	Sand dunes (a UK BAP Priority Habitat) are found along much of the East Grampian coastline. The dunes are managed in a number of ways but face increasing pressures from development and recreation. In places this has led to wide spread damage of the dune systems. *This aspect has been classified as work required due to the number of threats facing coastal dune systems and their potential impacts.*
Coastal Cliffs and Heath	■	?	0	The coastline of East Grampian has long stretches of cliffs particularly south of Peterhead and Aberdeen. Much of the coastal heath is designated to aid its protection; nonetheless it is facing a number of pressures including erosion, invasive species and agriculture. *This aspect has been classified as work required due to the number of threats facing coastal cliff and heath and their potential impacts.*
Estuarine Areas	■	?	0	The five estuaries along the East Grampian coast represent a small amount (0.098%) of the total UK estuarine area. They support large numbers of species most notably wildfowl and waders. Estuaries are at risk from eutrophication; leading to the growth of macroagal mats thus reducing their diversity and productivity. *This aspect has been classified as work required due to the number of threats facing estuarine areas and their potential impacts.*
Intertidal Habitats	■	?	0	The intertidal zone is home to a number of habitats including saltmarsh, mudflats, muddy gravels and rocky shores. Many of these habitats contain species of national or international importance or are locally significant. The current factors affecting the intertidal habitats are numerous but can include habitat loss; erosion and sedimentation; pollution; disturbance; dredging; climate change and sea level rise. *This aspect has been classified as work required due to the number of threats facing intertidal habitats and their potential impacts.*
Marine Environment	■	?	0	Marine habitats off the East Grampian coast include open seawater; mud habitats in deep water; sand and gravels; inshore sublittoral rock and a number of wrecks which can act as artificial reefs and become biodiversity hotspots. Large numbers of species are dependant upon these habitats but information on both the extent and status of the habitats and species is limited. The marine environment in this area is subject to a number of pressures including climate change; marine litter; introduced species; disturbance and habitat modification; and habitat loss through anthropogenic developments. *This aspect has been classified as work required due to the number of threats facing the marine environment and their potential impacts.*
Biodiversity	■	?	0	The area supports a diverse range of biodiversity, with a number of protected and rare habitats and species present. The coastal and marine area covered by this report also supports 81 Red list species. However, of the 131 designated sites, condition reporting has shown that 50 are listed as unfavourable. Generally, there is insufficient monitoring of indicators to know whether UK biodiversity targets are being met in the North East however individual species are in some cases well monitored and have been used as indicators. *This aspect is classified as work required due to the lack of knowledge and monitoring and the declining condition of some designated sites.*
Maritime Historic Environment	■	?	0	The coastal zone contains a rich variety of archaeological sites ranging from Mesolithic landscapes, through the Bronze Age and Iron Age settlements to the lost Medieval village of Rattray Head and the recent WWII defences of pillboxes and anti-tank blocks. There are also several hundred shipwrecks located from the low water mark to deeper waters further offshore. The historic environment in this area is subject to a variety of pressures, including climate change, development works and environmental disturbance. *This aspect has been classified as work required owing to the number of threats facing the historic marine environment and their potential impacts.*
Historic Coastal Rights			0	Historic rights apply to all coastal waters and in many cases the foreshore and include a public right of fishing, navigation and recreation, which includes the shooting of wildfowl.

ASPECT	STATE	TREND	CONFIDENCE	DESCRIPTION
Coastal Access	■	↔	II	Coastal access is heightened by the Land Reform (Scotland) Act 2003, as the legislation further clarified access rights and has been well publicised. Furthermore, the core paths plan and Nave Nortrail aim to provide a network of public paths. However, the coastal path is not complete and much work is needed to ensure the paths are suitable for a wide range of users. *This aspect has been classified as work required due to the current condition of the coastal path.*
Seaside Awards	■	↑	III	Seaside awards are given to beaches meeting a number of criteria including good water quality; litter management; information provision; community involvement; safety measures and active management. The East Grampian coast has seven beaches with the award including Aberdeen; Stonehaven; Balmedie; Collieston; Fraserburgh; Waters of Philorth; and Peterhead Lido. Due to water quality, Cruden Bay lost its award for the 2008 season. Due to visitor number criteria, all eligible beaches (apart from Cruden Bay) now hold the award. *This aspect has been classified as satisfactory, as despite an overall increase, Cruden Bay recently lost its award.*
Designated Bathing Waters	■	↑	III	The East Grampian coast currently has seven bathing waters, as designated under the Bathing Waters Directive. The results show that there has been a general increase in local water quality, although there have been exceptions to this. Poor water quality in the area can generally be attributed to agricultural run off and the direct discharge of human sewage in some areas. *This aspect has been classified as work required due to poor water quality at some sites.*
Nutrients in Coastal Waters	■	↑	II	Decaying organic matter, nitrates and phosphorous enter coastal waters via rivers, generally from agricultural run off and sewage discharges. High inputs cause excessive plant growth and oxygen depletion leading to eutrophication. Four of the rivers on the East Grampian coast have shown a drop in the levels of Total Phosphorus since 2000. The levels of Nitrate have remained stable. *This aspect has been classified as work required due to the continually high levels of nutrient input.*
Marine Litter	■	↓	II	Sources of litter include direct littering via beach users; fishing; sewage related debris; and shipping. Litter threatens wildlife through entanglement; ingestion; ghost fishing; blockage of the intestinal tract; and dispersal of alien species via litter rafts. The effects also extend to economic impacts on fisheries; aqua-culture; human health; recreation and leisure usage; navigation; military activities; power generation; seawater abstraction; flood defence; agriculture; and aesthetic impacts. A number of initiatives have been set up to reduce litter. These show an increase in the numbers participating in beach cleans and a large increase in litter levels in 2007, with much of the waste being left by beach visitors and from the fishing industry. *This aspect has been classified as work required due to the increases in litter levels.*
Contaminated Land	■	↔	II	One site along the East Grampian coast has been confirmed as contaminated. Blackdog was used as a landfill for drill muds which have since begun to leach onto the foreshore and into inshore surface and ground waters. A successful planning application was submitted to canalise Blackdog burn to slow the dune erosion in an attempt to contain the pollutants. A small number of radioactive particles have been found on Aberdeen Beach. *This aspect has been classified as work required due to the uncertainty of the potential impacts of the Blackdog landfill.*
Pollution Incidents	■	↑	II	The number, location and volume of pollution incidents are recorded annually. The details of the reported incidences in this area since 2001 show that there was a general increase in spills for the period 2001–2006 with the last two years having fewer incidences reported. *This aspect has been classified as satisfactory due to the reduction of incidents in recent years.*
Climate Change	■	?	0	Climate information has shown the air and surface water temperatures for this area to be higher than normal. Sea level has risen by 7cm in Aberdeen during the last century. Much work is still required to understand the potential effects of these changes. *This aspect has been classified as work required as the potential causes and effects of climate change are yet to be fully understood.*

DISCUSSION AND CONCLUSION

A great deal of information exists on the local coast, though locating this information has proved both difficult and time consuming in some cases. Large data gaps also exist particularly relating to social data at the local level. Some trend data has been found and where it has not, initial data sets have been gathered to allow trends to be shown in the future.

Overall, the social data collected shows the area to be performing well in terms of its society with many of the aspects being quite positive; the economic data shows high levels of variation, with some aspects performing much better than others. The environmental section identified a number of weaknesses, with the majority of aspects needing further work.

This report has allowed an assessment of the local coast to be made, indicating whether each of the aspects are good, satisfactory or in need of further work and improvement at the local level. Where it was felt improvement is needed or achievable, actions and partner organisations have been identified. It is recommended that each of the 'work required' issues and topics are taken forward as projects to meet the actions arising from this plan.

1.0 INTRODUCTION

1.1 Importance of the State of the Coast

This State of the Coast report brings together a wide range of coastal data currently held on the local area, by both individuals and organisations. In order to effectively manage the East Grampian coastline, an assessment of the present situation needs to be made. This can only be achieved if information is brought together into one document, to inform developments and priorities whilst providing a base line for future decision making and as a method for measuring change.

The marine and coastal environment plays a fundamental role in all of our lives and as such, its health is important to everyone who visits, lives and works in the north east. A healthy marine and coastal environment is not only crucial for maintaining ecosystems but it is also central to, and essential for, numerous everyday activities and functions both consumptive and non-consumptive including;

- Employment opportunities – Scotland's seas support approximately 50,000 jobs (excluding oil and gas extraction)
- Low input food production – 60% of Scotland's food exports come from our seas, worth approximately £422 million annually
- Transportation of goods and people – Scotland's ports handle over 100 million tonnes of cargo and 8 million passengers annually
- Leisure, recreation and tourism – boating alone is worth £250 million to the countries' economy
- Source of energy – Scotland has 25% of Europe's tidal and offshore wind resource
- Climate control
- Carbon storage
- Waste disposal including sewage, cooling waters and run off
- Helping to provide the basics of life
- A primary producer of oxygen
- Sustaining biodiversity – Scotland's seas contain over 40,000 species
- Aggregate supply
- A natural sea defence
- Research and education resource
- Preservation of our history and heritage

1.2 East Grampian Coast

Situated in the north east of Scotland, the East Grampian coast runs from Kinnaird Head in Fraserburgh to the mouth of the River North Esk by St Cyrus (figure 1.1); a length of approximately 100 miles (160km).

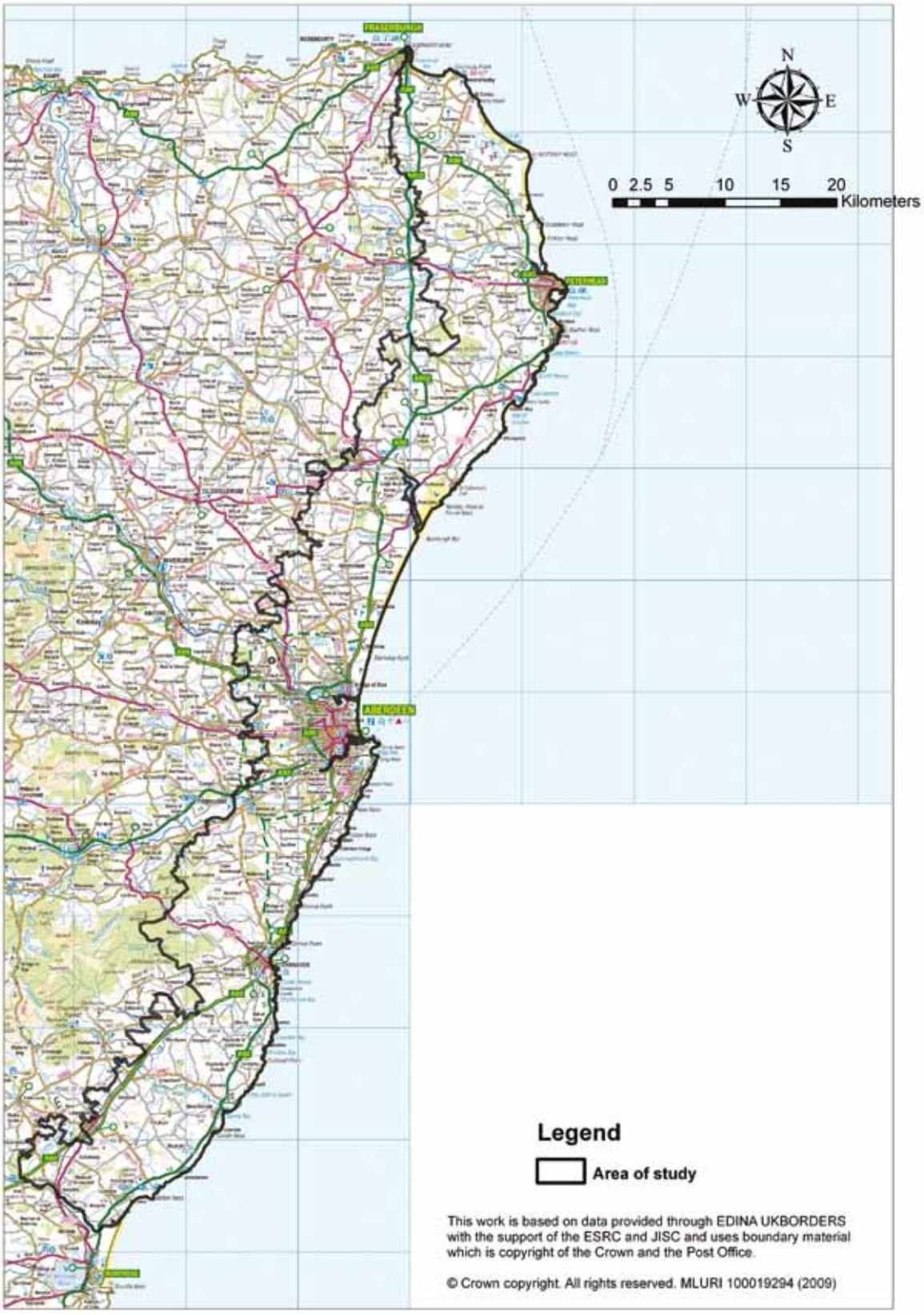


Figure 1.1 Report coverage area (OS, 2009 and OS, 2009a)

The coast in the area is very diverse with cliffs, rocky shores, sandy beaches, estuaries, salt marsh[1] and some of the largest coastal dune systems in the UK (figure 1.2).

Figure 1.2 Forvie National Nature Reserve has the fifth largest dune system in the UK (Drysdale, A. 2008)

The area has many quiet and undisturbed beaches and diverse biodiversity from rare birds, to cetaceans[2] and coastal flora; a great deal of which can be viewed in its near-natural habitat. Much of the coast is protected for its nature conservation value to safeguard the most environmentally important sites and ensure the conservation and enhancement of both habitats and species. This includes the National Nature Reserve at Forvie which covers almost 1000 ha of sand dunes, dune heath and the River Ythan estuary which supports one of Britain's largest colonies of breeding eider ducks. The Loch of Strathbeg near Fraserburgh is internationally renowned for its migratory wildfowl including pink-footed geese, black-tailed godwits and mute swans. The reserve at St Cyrus is particularly noted for its distinctive range of plants and insects. In addition there are smaller, less well known protected sites such as the Waters of Philorth, Donmouth and the Buchan Ness to Collieston Special Area of Conservation, designated for its abundance of coastal cliff vegetation.

The north east coastline has distinctive geomorphology with many landforms created by the successive advances of ice sheets during the last ice age and further transformed by the erosional forces of the sea. The coastal geology changes from north to south from the granites, schists and gneisses of Fraserburgh to the Old Red Sandstone and conglomerates in the south of the region. To the north of Stonehaven, the Highland Boundary Fault which separates the hard Precambrian and Cambrian metamorphic rocks from the softer, sedimentary rocks of the Devonian and Carboniferous periods is exposed in the cliff face.

[1] A type of marsh found only in intertidal area between the land and salt water

[2] The collective name for whales, dolphins and porpoises

The key land use in the north east coastal zone is agriculture including both arable and livestock farming. The coastal dune systems are utilised for conservation as well as recreation. Recreation is widespread along the coast but is often centered on villages and towns where the infrastructure and path network enable easy access.

Industry, with the exception of St Fergus Gas Terminal (figure 1.3) is centered on the main settlement areas of Fraserburgh, Peterhead, Aberdeen and Stonehaven, making much of the coastline relatively undeveloped when compared to other areas of the UK.

Figure 1.3 St Fergus Gas Terminal with its rural, coastal setting (Hay, I. 2007)

1.3 Factors Influencing the Coast

The factors influencing the state of the East Grampian coast are numerous and include the often competing demands placed upon it. In many cases these will vary over time and as such, the coast is subject to continuous change. Many changes result from a combination of natural forces, a changing climate and anthropogenic demands[3] which increase the pressure on the coast. Anthropogenic pressures and demands include an increasing population in the coastal zone who create more waste and sewage which then requires disposal. In addition, there are amplified requirements for food, energy, aggregates, transportation of goods and people along with increasing industry, tourism and recreation.

The combination of natural and anthropogenic pressures has in places, lead to coastal squeeze, whereby the coastal zone is compressed between a fixed coastal boundary such as coastal developments or hard engineering sea defences, and the rising sea level. This may reduce sediment availability, steepen and narrow the foreshore and culminate in an overall reduction of habitats and biodiversity.

1.4 Aims

This report has been written to collate, for the first time, a range of qualitative and quantitative information on social, economic and environmental aspects along the East Grampian coast. It is anticipated any trends will be identified and where there are no existing data, initial data sets will be gathered to allow comparisons to be made in future editions of this document. Furthermore, this report has been written for East Grampian Coastal Partnership staff to identify problems and potential solutions and to steer the future work of the Partnership. It is hoped the findings of this report will be of interest to local stakeholders and decision makers as well as communities of place and interest.

[3] Those derived from human activity

The State of the Coast report aims to assess the health of the local coast and coastal communities against the Scottish average (where possible) to indicate whether each of the aspects is good, satisfactory or in need of improvement at the local level. Where improvement is needed or achievable, actions and partner organisations will be identified in an attempt to remediate the issue. The report deals with quantifiable measures wherever possible with a subjective judgement in other cases. It is anticipated that through the writing of this report, the data which exists on the local coast held by agencies, organisations and individuals and any data gaps will be identified.

In 2002, the Recommendation concerning the implementation of integrated management of coastal zones in Europe (ICZM)[4] was approved by the European Parliament and the Council. Member States reported their experience gained with its implementation. The European ICZM expert group, composed of all coastal Member States, recognized the importance of indicators and proposed the Member States employ two sets of indicators:

1. A set of indicators to measure the progress of implementation of ICZM
2. A core set of 27 indicators to measure sustainable development of the coastal zone

The indicators are divided according to the seven goals of the EU ICZM Recommendation:

- To control further development of the undeveloped coast, as appropriate
- To protect, enhance and celebrate natural and cultural diversity
- To promote and support a dynamic and sustainable coastal economy
- To ensure that beaches are clean and that coastal waters are unpolluted
- To reduce social exclusion and promote social cohesion in coastal communities
- To use natural resources wisely
- To recognise the threat to coastal zones posed by climate change and to ensure appropriate and ecologically responsible coastal protection

The indicators in each group aim to help the European Commission, Member States and coastal partnerships monitor progress towards achieving the goals for coastal sustainability as set out in the EU Recommendation (Breton, F 2006). Throughout the report (marked in the text by *) the indicators have been used as a measure of sustainable development[5] in the coastal zone.

1.5 Report Boundaries

The coast, by its nature cannot be defined by spatial boundaries. Many processes affect the coast and, simultaneously those processes are often affected by the coast. However, for the purpose of this report, a spatial boundary is required to enable the collation of data. The landward limit of the coastal zone will be defined using a buffer zone from the coast with a set distance of 10km. Output areas (the smallest area for which detailed 2001 Census results are available) which have their centres entirely within this buffer zone (figure 1.4) have been employed. The use of a set distance allows the approach to be reproducible in other areas if required for comparative purposes. Offshore, the report will extend to 12 nautical miles (nm), to encompass the UK's territorial waters[6].

[4] Integrated coastal zone management – a joined up approach to managing the coast

[5] Development which meets the needs of today without comprising the ability of future generations to meet their needs

[6] The coastal waters extending to 12nm of a coastal state, over which a country has jurisdiction

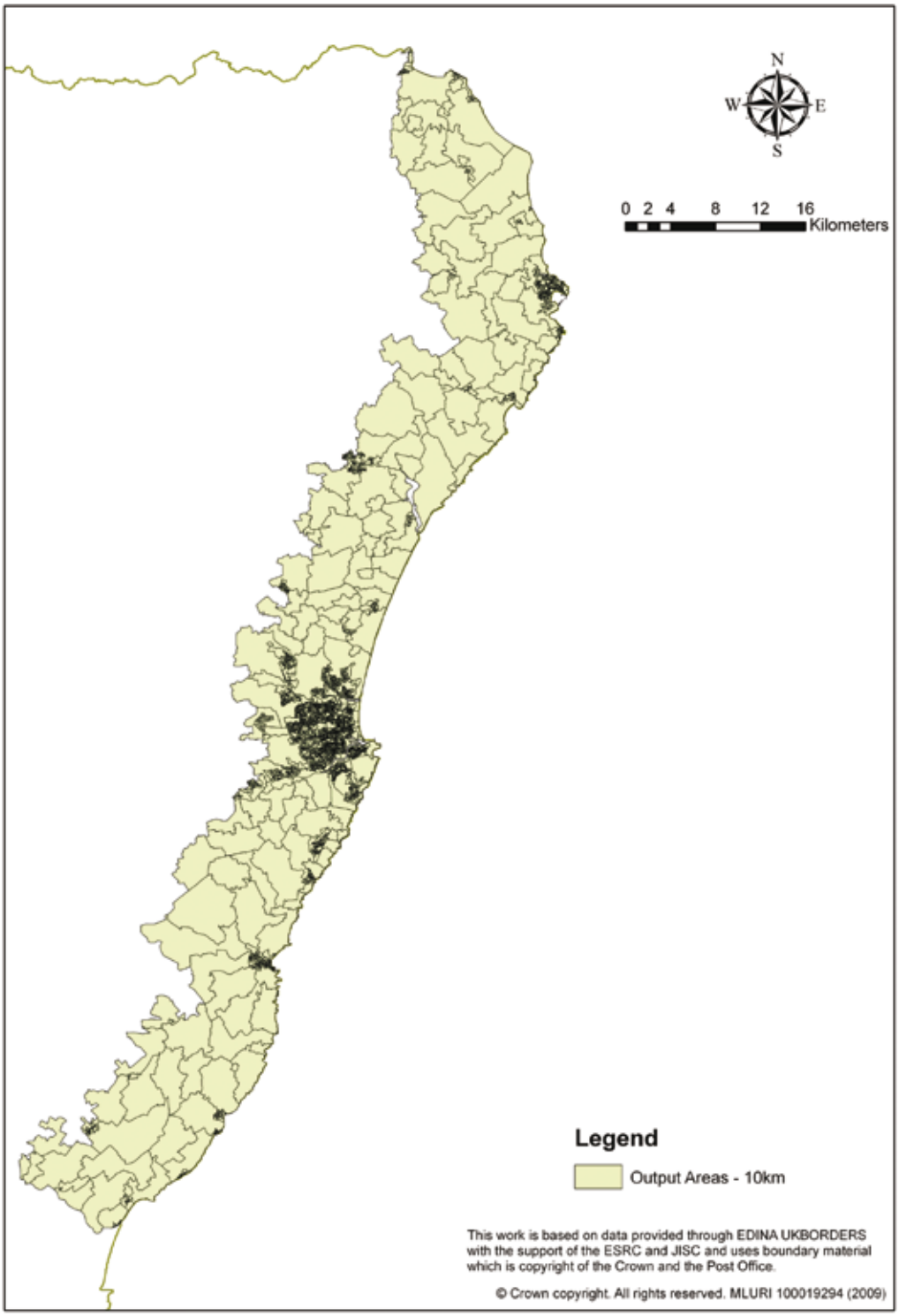


Figure 1.4 Report coverage and output areas (GROS, 2001)

1.6 Stakeholder Input and SWOT Analysis

A SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis has been used as an initial assessment of the East Grampian coast based on a stakeholder questionnaire (appendix 1) carried out in July 2008. The results of which will influence the contents of this report.

Aim-To improve the state of the East Grampian coast

STRENGTHS

- Unspoilt natural beauty
- Recreational opportunities
- A place to escape
- Biodiversity
- Protected sites
- History
- Geology
- Geography
- A distinct culture and heritage
- A wide range of contacts and stakeholders
- Diverse natural resources
- Opportunity to see wildlife close up
- Not over developed
- Variety of landscapes

WEAKNESSES

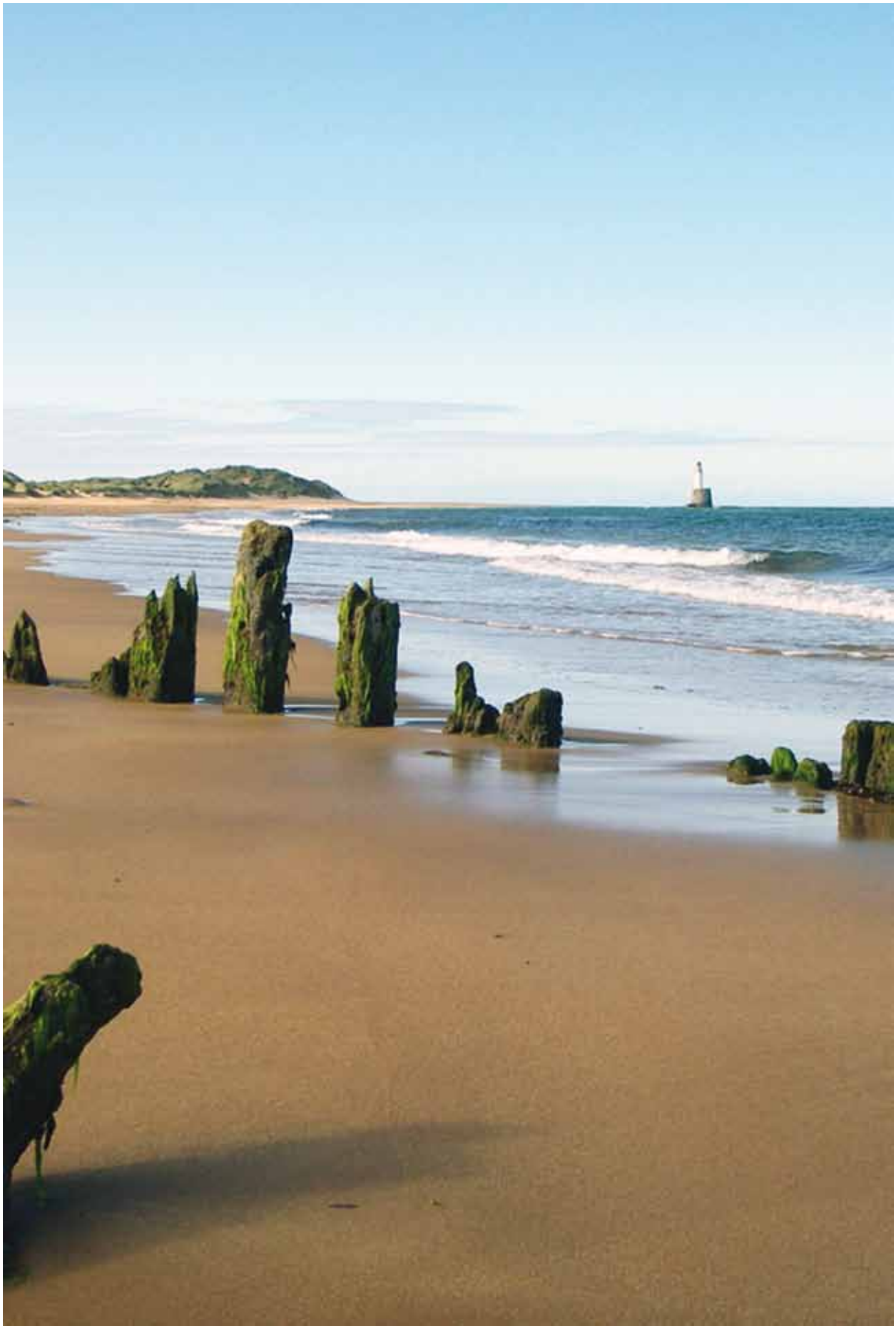
- Lack of resources to maintain areas' history and culture-including funding and people
- Poor promotion of area
- Lack of data and information
- Lack of facility/service provision
- Poor access
  – Coastal path
  – Small boat owners
- Lack of berthing facilities for recreational vessels
- Many areas economically dependant on the sea
- Poor public transport along the coast

OPPORTUNITIES

- Development of tourist and recreational potential and increased financial benefits
- Strong business interest
- Education and awareness raising
- Rising costs on travel abroad may increase tourist figures
- Unique area
- Linkage of coastal path to local resources, natural and built
- More joined up working
- Development of access points for water users
- Environmental education resource

THREATS

- Environmental degradation
- Declining traditional industries
- Declining fish stocks
- Quality of riverine input
- Pollution
- Litter including fly tipping
- Relationships and competing demands
- Climate change
- Development and related conflicts
- Erosion and flooding
- Species loss
- Recreational conflicts
- Wildlife disturbance



2.0 COASTAL MANAGEMENT

2.1 Significant Legislation

There is much legislation pertaining to the protection of the maritime environment. The majority has stemmed from European Directives and transposed into UK and Scots law, resulting in a multi-layered approach. Examples of the key legislation are shown in figure 2.1.

Legislation	Relevance to the north east marine and coastal environment
1982 UN Law of the Sea Convention	Provides a framework for the regulation of the oceans and sets out the responsibilities of coastal nations for marine habitats and species
MARPOL Convention	Concerned with pollution from shipping and includes provisions for identifying Particularly Sensitive Sea Areas and Special Areas
OSPAR Oslo Paris Convention	Aims to prevent pollution of the north-east Atlantic from land-based sources, and from dumping from ships and aircraft
Annex V to the OSPAR Convention on Protection of the Marine Environment of the North East Atlantic	Identifies important deep water or offshore habitats and species for protection
London (Dumping) Convention	Protection of the marine environment from pollution from ships, aircraft and man-made structures and that resulting from normal operations
EC Habitats Directive (Directive 92/43/EC)	Protection for marine habitats to 200 nm. The Directive has been transposed into UK law by the Conservation (Natural Habitats, &c.) Regulations 1994
EC Birds Directive (Directive 79/409/EC)	Protection and management for wild birds. The Directive gives power to designate Special Protection Areas to protect vulnerable species
Water Framework Directive (Directive 2000/60/EC)	Designed to protect and restore aquatic ecosystems. Assessment will be by the ecological status of the water bodies and is transposed by the Water Environment and Water Services (Scotland) Act 2003
1981 Wildlife and Countryside Act	Seals, cetaceans and a number of invertebrate species are given various levels of protection
Nature Conservation (Scotland) Act 2004	The Act strengthens protection for Sites of Special Scientific Interest, with maximum fines for intentional or reckless damage and sets out a duty for SNH to prepare a Marine Wildlife Watching Code
Food & Environment Protection Act, part II, 1985	Licences are issued for the control of dumping at sea and shoreline construction works, land reclamation and beach nourishment
The Urban Waste Water Treatment Directive (91/271/EEC)	Aims to reduce pollution and subsequent impacts on coastal waters from sewage discharges
EU Common Fisheries Policy	Management of the fish stocks in the UK waters and other EU coastal states
Inshore Fisheries Management	Conservation measures aimed at protecting stocks
UN agreement on Straddling Stocks	Aimed at achieving the holistic management of migratory stocks
Marine (Scotland) Bill	The Bill introduces a framework for the sustainable management of the seas around Scotland, ensuring the need to protect our seas is integrated with economic growth of marine industries
EU Marine Strategy Directive	Aims for a more holistic approach to the management of the marine environment in Europe
Conservation of Seals (Scotland) Order 2007	Extends the current closed season to the whole year between Stonehaven and Dunbar for common seals

Figure 2.1 Legislation covering the marine and coastal environment

2.2 Ownership

The legal situation and ownership relating to the coastal and marine environment is extremely complex and in turn affects its management. The territorial sea of the UK extends out to 12 nautical miles (nm) and within this limit, the Crown Estate own virtually all of the sea bed and approximately 55% of the foreshore (the area between MHWS[7] and MLWS[8] in Scotland). The remainder of the foreshore is in private ownership, including the Ministry of Defence, the Forestry Commission, Local Authorities and Harbour Authorities as well as a number of conservation bodies.

The owner of land usually has the exclusive rights to that land including the use of it and how it is managed. However, these rights are subject to any other legal or conventional[9] rights which may restrict them. Within the context of the coastal zone a number of legal and public rights apply including the right of navigation, fishing and recreation.

The public right of navigation applies to the sea and all navigable tidal waters and is predominantly one of innocent passage but does also include recreational sailing and the right to moor and beach boats and any other associated activities required to exercise that right (Rowan-Robinson and McKenzie Skene, 2000). The public right of fishing extends to whitefish and shellfish in the sea and all tidal waters, on and from the foreshore. It includes the right to perform any associated activities for example landing fish, drying nets and beaching boats. Exceptions to this right include all Royal fish including oysters, mussels, salmon and possibly lobsters (Reid and Zimmerman, 2000). The public right of navigation has preference over the public right of fishing. The extent of the public right of recreation is uncertain but is thought to extend to both the foreshore and the sea and include swimming and the shooting of wildfowl.

None of the above public rights carry with them a right of access to the foreshore, only along it. Historically, access could be gained only by public road, right of way or other lawful access point. This has since been over ruled to some extent in the Land Reform (Scotland) Act 2003.

2.3 Coastal Planning

Development in the coastal zone is controlled by local authorities under their planning powers and guided by National Planning Policy Guideline 13 (Coastal Planning) and Planning Advice Note 53 (Classifying the Coast for Planning Purposes), however this extends only to MLWS. Beyond this point terrestrial planning powers do not apply and proposed development is subject to control via seabed leases. Leases are required from the Crown Estate for activities such as port and harbour development; offshore renewable energy regeneration; and flood prevention works. In determining an application, they may take into account a number of planning factors and the effects of any development on the wider marine environment. In addition to this, any construction works below MHWS requires consent under Section 34 of the Coast Protection Act 1949. Local authorities now have responsibility out to 12nm for finfish and shellfish farming.

[7] Mean High Water Springs
[8] Mean Low Water Springs
[9] Based on or in accordance with general agreement, use, or practice

2.4 Integrated Coastal Zone Management

Integrated Coastal Zone Management (ICZM) is a process to bring together those involved in the development, management and use of the coast to achieve sustainable development at a local level. In 2000, proposals were made for a European Parliament and Council Recommendation for the implementation of ICZM in Europe where promotion would be through the use of community instruments and programmes. The Scottish Coastal Forum (SCF) was set up at a national level in 1996 to deal with coastal issues in Scotland and to communicate with Government in terms of ICZM. Part of the SCF's role is to encourage the formation of Local Coastal Partnerships and to further progress ICZM in Scotland.

The principles of ICZM have been set out and include;

- A broad overall perspective (thematic and geographic)
- A long-term perspective
- Adaptive management
- Local specificity
- Working with natural processes
- Involving all the parties concerned
- Use of a combination of instruments designed to facilitate coherence between sectoral policy objectives and coherence between planning and management.

These principles of ICZM will be embedded throughout the relevant proposals in the forthcoming Marine (Scotland) Bill.

At present, ICZM in Scotland is not enshrined in statute and therefore a voluntary approach is taken; predominately delivered by Local Coastal Partnerships. However, the actual effectiveness of ICZM in the current situation has been questioned. It has been seen to be more theoretical and rarely transferred into practice as a successful way of managing the coast (Chaniotis and Stead, 2007). The lack of funding available to implement ICZM has also played a major role in its effectiveness.

2.5 Marine Bill

The consultation on Scotland's first Marine Bill – Sustainable Seas For All, was launched in July 2008 and closed on October 6, 2008. The 9,135 individual responses to the consultation have been analysed and show;

- 96% of those that expressed an opinion agreed that change is needed to the management and legislative framework for managing Scotland's seas to deliver the following five elements:
  - A new system of planning for the sustainable use of Scotland's seas
  - Improvements to marine nature conservation to safeguard and protect Scotland's marine assets
  - A streamlined and modernised marine licensing and consents system
  - Better stewardship backed up by robust science and data
  - A new structure, Marine Scotland, to deliver sustainable seas

Generally respondents felt these changes would bring a positive impact on nature conservation; increased clarity from an integrated approach to planning and management; and protection of commercial assets. The Marine Bill is expected before the Scottish Parliament in winter 2009.

2.6 Marine Spatial Planning (MSP)

In Scotland the work of the Advisory Group on Marine and Coastal Strategy has fed into the discussion of a Scottish Marine Bill. Included in the findings is the possibility of Local Coastal Partnerships becoming a delivery body for MSP at the local level. It sees MSP as a tool of ICZM not as a replacement; Marine Spatial Planning will take most of the principals of ICZM and add a spatial component. This will include producing use/conflict maps that will be of benefit to those with an interest in coastal waters including developers who will be given an indication of suitable areas for development.

2.7 Designations

The use of designations to protect habitats or species and as a management tool is now common place. There are a number of designations relating to the marine and coastal environment to either the habitats or species which rely on those habitats, though many have limitations in relation to conservation of coastal areas. A number of examples are shown in figure 2.2. Despite the numerous designations there is concern whether the coast is adequately protected, as there are limited statutory designations applicable below MLWS.

Designation	Detail	Limitation
Sites of Special Scientific Interest (SSSI)	To protect important areas of flora and fauna or for geological interests	Applicable only to MLWS
National Nature Reserve (NNR)	Protect and enhance nature conservation	Applicable only to MLWS
Local Nature Reserve (LNR)	Established for their conservation and amenity value	Few coastal LNRs exist
Marine Nature Reserve (MNR)	Designated to protect their marine flora and fauna from MHWS to 3 nm	Scotland has only one voluntary MNR (St Abbs)
Special Protection Area (SPA)	To safe guard the habitats of migratory bird species	Applicable only to MLWS, though consultations are taking place for their extension
Marine Special Area of Conservation (MSAC)	To conserve rare or threatened habitats and species	34 sites now designated in Scotland
Ramsar Sites	To protect wetlands as wildfowl habitat	Can extend to a depth of 6 meters but in practice usually MLWS

Figure 2.2 Coastal and marine designations

2.8 Environmental Impact Assessment

Certain developments may require an Environmental Impact Assessment (EIA) irrespective of whether they are also subject to planning control. EIA's are carried out to assess a projects impact on the environment where it is likely to have significant effects due to its size, location or nature. The process is of great importance in the coastal zone as they act as a form of planning where many developments (all of those below MLWS) are not subject to planning control.

2.9 North East Scotland Local Biodiversity Action Plan

North East Scotland Local Biodiversity Action Plan (NE LBAP) is a locally driven process to conserve important species and habitats for the benefit of us and future generations. LBAP is a partnership of local authorities, environmental, forestry, farming, land and education agencies, businesses and many individuals involved in biodiversity across North East Scotland (Aberdeen, Aberdeenshire and Moray). NE LBAP has four coastal and marine action plans in place or under development including: Coastal Sand Dunes and Shingle; Coastal Cliffs and Heath; Estuarine and Intertidal Habitats; and Marine Habitats. It has been found that actions from LBAP plans are most likely to be implemented when it is already part of one of the partners' jobs to carry out the action or where a project officer is employed specifically to implement an action plan.

Species plans appear to be easier to implement and monitor than habitat plans; the actions that will benefit species are often more defined and charismatic target species attract funding. In some cases (e.g. water vole action plan and red squirrel action plan) the original targets have been surpassed. Both of these action plans have had specific project officers employed to implement actions.

Plans will normally have a working group that meets and agrees on actions which group members carry out. The limiting factors when implementing actions are often paid staff time and project funding. LBAPs are effective in providing general awareness raising events, although measuring the amount of awareness raised is difficult.

2.9.1 Marine Habitats Action Plan

The Marine HAP was completed in 2008. After talks with the Highland LBAP it has been decided that it would be beneficial to have a similar plan across the two areas tailored individually where required. It is hoped the two groups can work together to implement common actions. The group is very proactive and it is anticipated much effort will be put in to achieving the aims and objectives of the plan.

2.9.2 Coastal Sand Dunes and Shingle

A number of partner bodies are working on this plan including local countryside rangers and SNH. The rangers have completed a number of actions relating to involving local people, awareness raising and guided walks. However, these would have generally been carried out as part of their current duties and are not as a result of the action plan. SNH have also carried out a number of the actions, as have North East Scotland Biological Records Centre and the local authorities.

2.9.3 Coastal Cliffs and Heath

This plan is currently in draft form and little work has been undertaken on the plan itself since 2006.

2.9.4 Estuarine and Intertidal Habitats

As with the other plans, a number of partner bodies were involved with the writing of the action plan. Some of the actions have been undertaken but again there are uncertainties as to whether this work would have been carried out as part of the individuals' current duties and not as a result of the plan.

2.10 River Basin Management Plans and the Water Framework Directive

The Water Framework Directive (2000/60/EC) (WFD) is a wide-ranging and ambitious piece of European environmental legislation transposed into Scottish law through the Water Environment and Water Services (Scotland) Act 2003. The Directive establishes a new legal framework for the protection, improvement and sustainable use of surface waters, transitional waters, coastal waters and groundwater through River Basin Management Plans based on River Basin Districts. The districts consist of a geographical area made up of one or more river basins and their associated estuarine, coastal and ground waters. Scotland is covered by two districts; the Scotland river basin district covers the majority of the country. A second district (the Solway Tweed river basin district) covers the waters of the Solway and the Tweed and is jointly managed by SEPA and the Environment Agency. A river basin management plan will be written for each of these river basin districts.

The WFD obliges member states to ensure the aforementioned waters achieve good ecological and chemical status. The Directive is in force up to three nautical miles from the territorial baseline for good ecological status. However, a number of water bodies and areas will be exempt from the requirements as they can be classified as heavily modified, for example Aberdeen Harbour. Such classifications mean that body/area does not need to meet the good ecological requirements of the directive but instead has an objective of good ecological potential, which has to be achieved by 2015.

SOURCES OF FURTHER INFORMATION:

- Full lists of the legislation relating to the marine and coastal environment can be found in The Law of The Sea – 3rd Edition, Churchill. R and Lowe, V (2003)
- NPPG 13 Coast Planning
  http://www.scotland.gov.uk/Publications/1997/08/nppg13-coastal
- PAN 53 Classifying the Coast for Planning Purposes
  http://www.scotland.gov.uk/Publications/1998/10/pan53
- Sustainable Seas for All; a consultation on Scotland's first Marine Bill
  http://www.scotland.gov.uk/Publications/2008/07/11100221/0
- Recommendations of the Advisory Group on Marine and Coastal Strategy: A Follow up to Seas the Opportunity: A Strategy for the Long Term Sustainability of Scotland's Coasts and Seas
  http://www.scotland.gov.uk/Publications/2007/03/08103826/0

ACTION POINTS:

- Work with NE LBAP to progress the local coastal and marine action plans and their targets

3.0 SOCIETY

3.1 Social Data

The collation of social data for the East Grampian coastal zone is an important aspect of this report; it has not previously been collated for this area as it is typically done at the local authority level. As such, it is felt this report should draw together this information for the first time and be used as a measurement of sustainable development. Social data such as that shown in this section helps to highlight the challenges currently faced and where further work is required, in order to create prospering communities as well as a means of reviewing progress.

The EGCP is a voluntary organisation which is required to seek funding for its work. Potential funders require social information for an area before deciding to make a funding award as it demonstrates who will benefit from any award monies. If this information is unavailable to EGCP, many funding opportunities cannot be explored.

The data within this section has been obtained from Scotland's Census Results Online (SCROL, 2001) unless referenced otherwise. **PLEASE NOTE** – the figures given in this report are indicative only and cannot be guaranteed as accurate.

3.2 Population and Migration

This section covers the basic demographic characteristics of the people who live within the East Grampian coastal zone;

- 292,920 people live within the East Grampian coastal zone; 144,090 of which are male and 148,830 female
- 67% of the population of Aberdeenshire and Aberdeen City live within 10km of the East Grampian coast*
- The area has a population density of 2.6 people per hectare; a little higher than the UK density of 2.4 and significantly higher than Scotland as a whole at 0.65/ha
- The average age of the population is 44.9 years, with a breakdown of the individual age groups shown in figure 3.1
- 85% of the population of the East Grampian coast have Scotland as their country of Birth and 9% are English. The remaining 6% are made up of people from Wales (0.4%), Northern Ireland (0.5%), Republic of Ireland (0.3%), Other EU countries (1%) and Elsewhere (3.8%)
- The majority (86 %) of the population in this area are White Scottish, 9% are White British, with the remainder being made up of a number of different ethnic groups including Indian, Asian and Chinese
- 40% of the population reported they follow no particular religion, 39% are Church of Scotland, 8% other Christian and 5% Roman Catholic. The remaining 8% are made up of a number of other religions and not answered (4%)
- The working population can be divided into the following occupation groups: Managers and Senior Officials (11%); Professional (12%); Associate Professional and Technical (14%); Administrative and Secretarial (12%); Skilled Trade Occupations (11%); Personal Service (6%); Sales and Customer Service (7%); Process, Plant and Machine Operatives (9%); Elementary Occupations (12%)

*ICZM Indicator

3.2.1 Age Profile

Figure 3.1 and 3.2 show the age profile of the population of the East Grampian coast and comparative details for Scotland. When compared to Scotland, the East Grampian coastal zone has a good age profile with no major differences in any of the individual age groups. Overall the area has a slightly higher percentage of people in the 16–44 age groups, levelling out in the 45–59 year olds group and a lower percentage of older (60 +) people. This may be attributed to the large student population in Aberdeen or the numbers of people attracted to the area for work that may then leave, at or before retirement age.

As the area has a similar age profile to Scotland, it can be assumed future population projections will be comparable. Scotland's population is anticipated to rise over the next 15 years due to more births, fewer deaths and more people coming to Scotland than leaving. However, it is projected that we will be an ageing nation, as our birth rate has declined since the 1980s and our population is likely to fall from 2020, whilst the rest of the UK is on a rising trend.

Across Scotland the number of children (under 16) is projected to decrease by 15% by 2031; the number of people of working age is projected to fall by 7%; the number of people of pensionable age is projected to rise by 35%; the number of people aged 75 and over is projected to rise by 75% (GROS, 2008). Whilst on a different scale, it can be inferred this situation for Scotland will be accurate for the East Grampian coast. If correct, these projections will have implications for the area's future dependency ratio (how many young people (under 16) and older people (over 65) depend on people of working age (16 to 64)). This can be used to measure an area's ability to produce the resources needed to maintain living standards for the whole population. However, this dependency is changing as younger people remain in education for longer periods of time whilst older people are working and living longer.

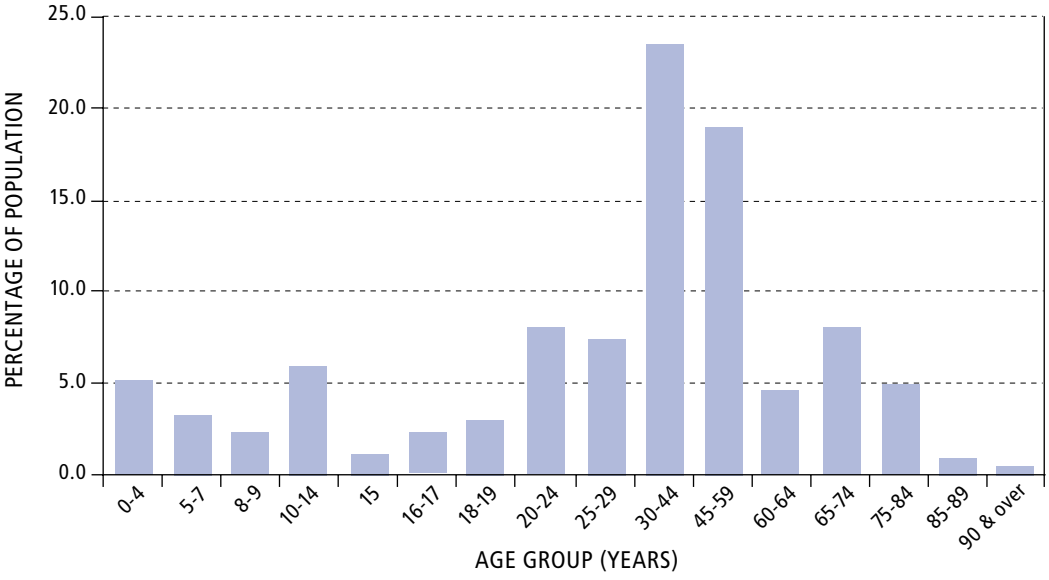


Figure 3.1 Age profile of the population of the East Grampian coast

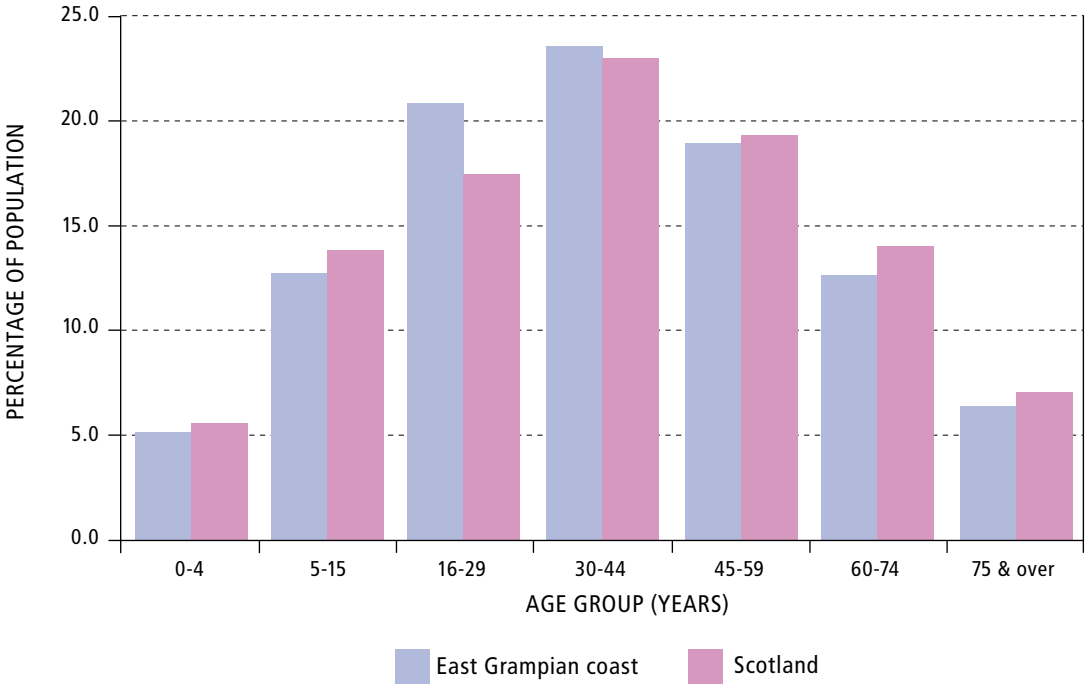


Figure 3.2 Age profile of the population of the East Grampian coast using Scotland as a comparative area

3.2.2 Economic Status

Figure 3.3 shows the economic status of the population of the East Grampian coast, using Scotland as a comparative area. From this, it is apparent that a larger proportion of the population is economically active when compared to Scotland as a whole and consequently fewer are either economically inactive or unemployed. Future versions of this document will allow comparisons to be made, as this information is not available for the East Grampian coastal area for previous years. However, Aberdeenshire and Aberdeen City have long experienced low unemployment levels. Since 1996 (when records for the area became available) levels have been much lower than Scotland and UK, and since this date the area has seen a 72% decline in the numbers registered unemployed (NOMIS, 2007).

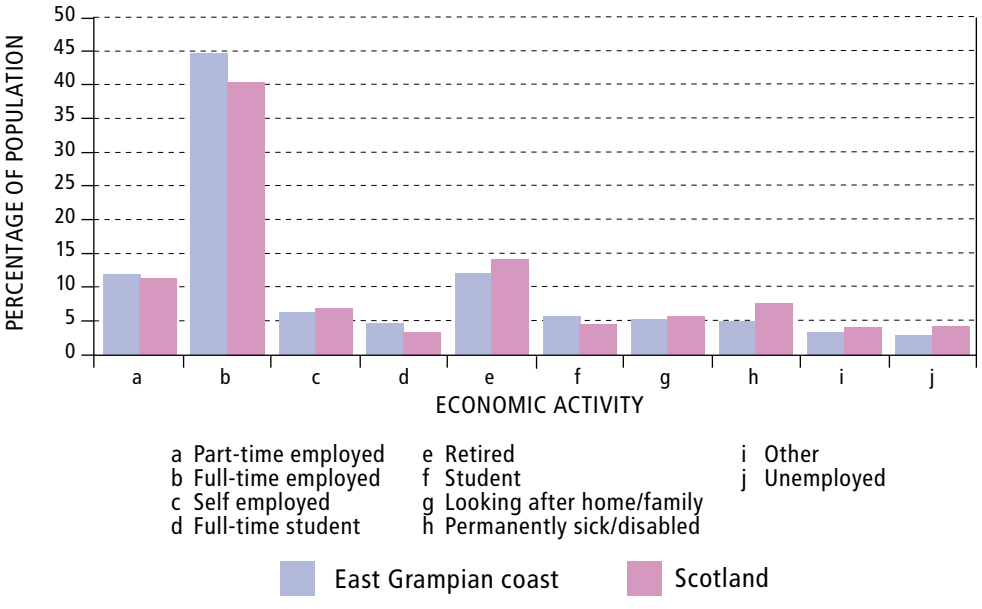


Figure 3.3 The economic status of the population of the East Grampian coast, using Scotland as a comparative area

3.2.3 Diversity of Employment

Figure 3.4 shows the industries of employment for the population of the East Grampian coast, using Scotland as a comparative area. Many of the industries support similar percentages of the population as they do across Scotland; however there are some exceptions including mining and quarrying. The main industries of employment for the area include: health and social work (11.3%); manufacturing (10.6%); real estate, renting and business activities (14.6%); and wholesale and retail trade repairs (14.5%), which together employ 51% of the population in total. Surprisingly, the industries which may be seen as more traditional to the area employ relatively few numbers. Agriculture, hunting and forestry employs 1% in total compared to 2.2% of the population across Scotland, whilst fisheries employs 0.5% compared to 0.3% across Scotland. Taking into consideration this area has two of the largest fishing ports in Europe; this is a small proportion of the local population.

Figure 3.4 The industries of employment of the population of the East Grampian coast, using Scotland as a comparative area*

*ICZM Indicator

3.2.4 Distance to Work

Figure 3.5 shows the distance travelled to the place of work by the population of the East Grampian coastal zone: 26% travel less than 2km; 51% travel less than 10km to their place of work, whilst 10% travel between 10 and >40 km. This compares favourably with Scotland as a whole, where the average distance travelled is 12 km. However, these figures may disguise the extremes in travel to work distances, as many in the far north and south of the region travel much greater distances to Aberdeen for employment.

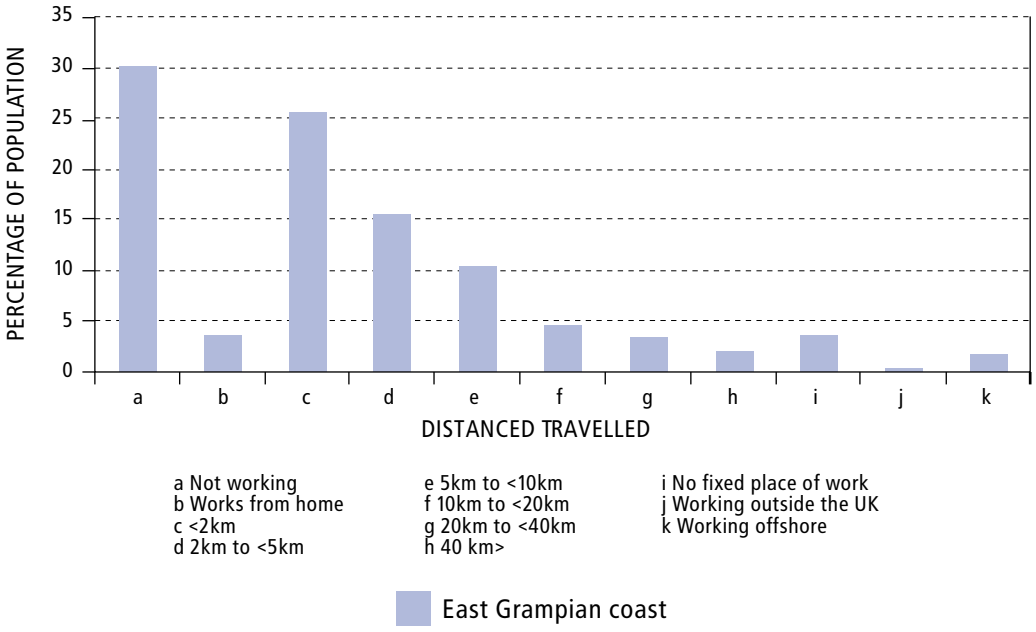


Figure 3.5 Distance travelled to place of work

3.2.5 Qualification Level

Figure 3.6 shows the qualification level of the population of the East Grampian coast. It can be seen that there are significantly fewer people with no qualifications in this area compared to Scotland. For each of the other qualification levels the area outperforms Scotland, most notably in the level 4 sector where 22% of the area's population have a First degree, Higher degree or Professional Qualification.

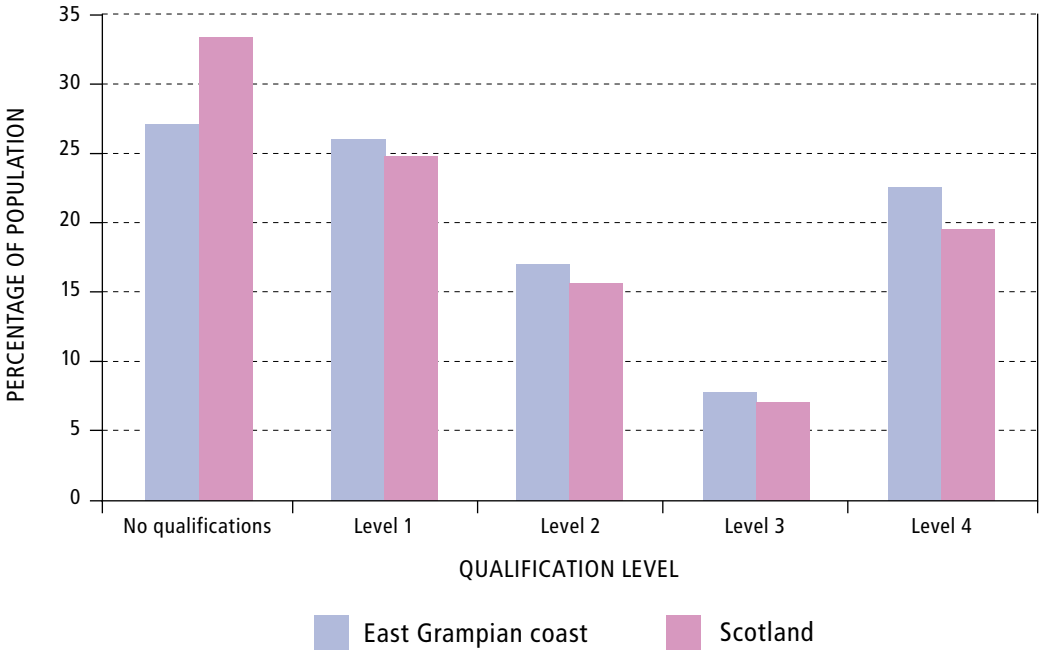


Figure 3.6 The qualification level of the population of the East Grampian coast, using Scotland as a comparative area

Level 1: 1 to 4 O level passes, 1 to 4 CSE/GCSE any grades, NVQ level 1 or Foundation GNVQ.
Level 2: 5 or more O level passes, 5 or more CSEs (grade 1), 5 or more GCSEs (grades A-C), School Certificate, 1 A level, 1 to 3 AS levels, NVQ level 2, Intermediate GNVQ.
Level 3: 2 or more A levels, 4 or more AS levels, Higher School Certificate, NVQ level 3, Advanced GNVQ.
Level 4/5: First degree, higher degree, NVQ levels 4 and 5, HNC, HND, Qualified Teacher Status, Qualified Medical Doctor, Dentist, Nurse, Midwife or Health Visitor.

3.2.6 Education

School exam attainment in Aberdeen City and Shire as a whole, is high compared to Scottish averages. Overall, Aberdeenshire continues to be one of the better performing local authorities in Scotland (though there are exceptions to this), despite drops in attainment levels for both Standard and Higher grades in 2006-07 (ACSEF, 2009). However, both Standard and Higher grades increased in the period 2007/08. The information is not available at output area level so could not be calculated for the East Grampian coast.

3.2.7 Income

In 2008, the average gross weekly wage in Aberdeen City and Shire was £616.30; higher than the Scottish average of £534.40 and also higher than the UK average of £574.30 (figure 3.7). The 20% highest paid in Aberdeen City and Shire earn on average £804.40 per week. The figure for Aberdeen City is higher than both the Scottish and UK figures at £854.20. The divide in earnings becomes apparent as the 20% lowest paid in Aberdeen City and Shire receive on average £328.13. This is slightly higher than both the Scottish and UK average though pockets of deprivation do exist.

LOCATION	AVERAGE GROSS WEEKLY EARNINGS	LOWEST		HIGHEST	
		10%	20%	20%	10%
Aberdeen City and Shire	£616.30	£279.00	£328.13	£804.40	—
Aberdeen	£650.20	£286.40	£339.50	£854.20	—
Aberdeenshire	£549.30	£264.50	£305.60	£705.60	—
Scotland	£534.40	£258.30	£306.30	£689.80	£862.40
UK	£574.30	£261.80	£312.60	£736.10	£946.80

Figure 3.7 Average Gross Weekly Earnings 2008 (ACSEF, 2008)*

The information is not available at output area level so could not be calculated for the East Grampian coast.

3.2.8 Household Deprivation

Households are classified by their level of deprivation in 1, 2, 3, or 4 dimensions:

- Employment (any member of the household aged 16 – 74 who is not a full time student is either unemployed or permanently sick);
- Education (no member of the household aged 16 and over has at least 1 Standard Grade or equivalent and no member aged 16 – 18 is in full time education);
- Health and disability (any member of the household whose health is 'not good' or has a limiting long term illness);
- Housing (the accommodation is overcrowded, in a shared dwelling, no sole use of bath/shower and toilet or has no central heating)

or a household can be classified as not deprived.

In Aberdeen City and Aberdeenshire 49% of households are not deprived, 29% are deprived in 1 dimension (it is not uncommon for rural houses to have no central heating system as many use open fires), 20% in 2 dimensions, 6% in 3 dimensions and 0.7% of households are deprived in all 4 dimensions (figure 3.8). This compares favourably with Scotland where 36% of households are not deprived, 29% are deprived in 1 dimension, 24% in 2 dimensions, 9% in 3 dimensions and 1% of households in Scotland are deprived in all 4 dimensions (GROS, 2008a).

The Scottish Governments' official tool for identifying concentrations of multiple deprivation across Scotland is the Scottish Index of Multiple Deprivation which is based on data zones. It shows Aberdeen City has seen relatively large increases in the number of data zones in the 15% most deprived areas between 2004 and 2006, with an increase of nine zones.

*ICZM Indicator

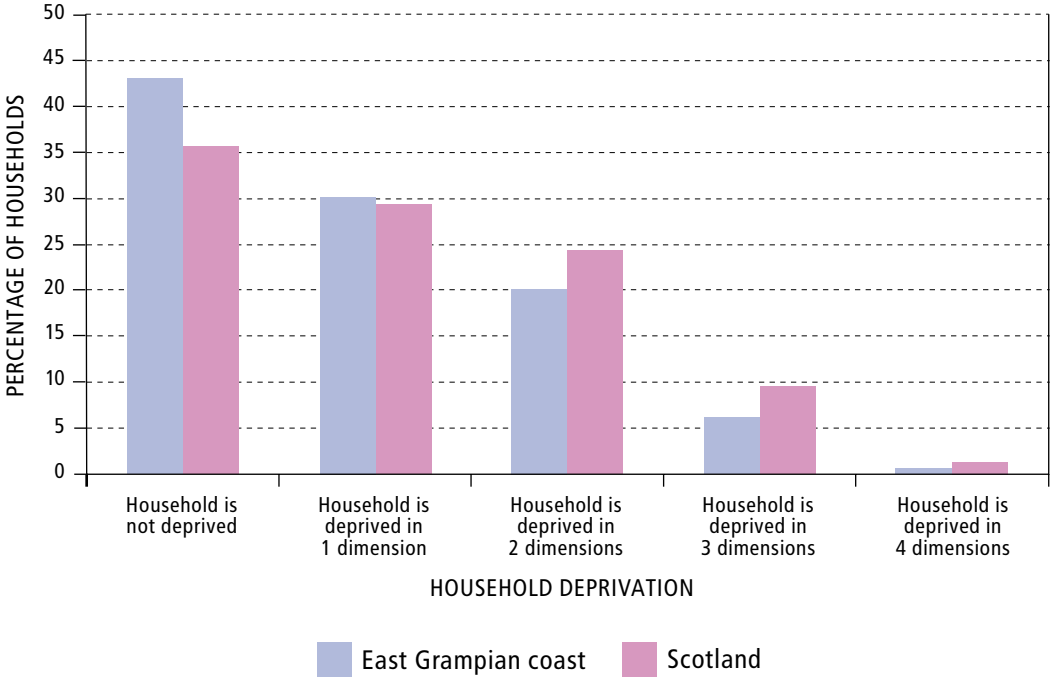


Figure 3.8 The levels of household deprivation for the population of the East Grampian Coastal Zone *

3.2.9 Health

This section looks at basic health information for the East Grampian coastal area and how this compares to Scotland as a whole. Figure 3.9 shows the health of the East Grampian coast is favourable when compared to Scotland as a whole. Fewer people (16.7%) suffer from a long term limiting illness (LLTI) when compared to Scotland (20.3%). Many other health profiles are available including life expectancy, hospital admissions and infant mortality; however this information is available only for Aberdeenshire and Aberdeen City local authority areas and not at the output area level.

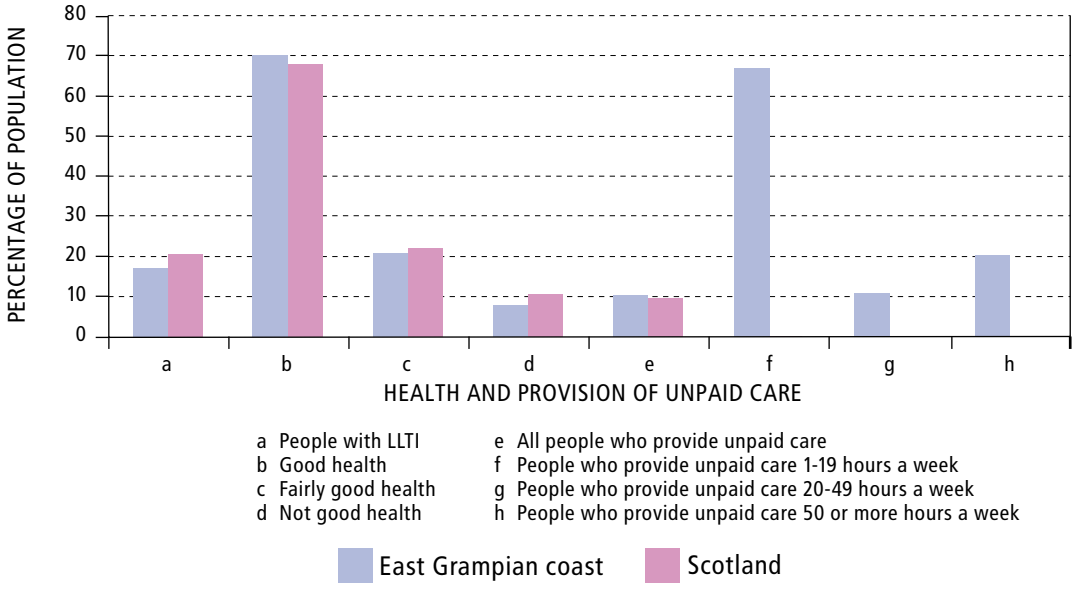


Figure 3.9 Health and Provision of unpaid care within the East Grampian coastal area, using Scotland as a comparative area

*ICZM Indicator

At the local authority level, Aberdeen has one of the lowest percentages (17.5%) of people with a long-term illness which limits their daily activities or work. In 1991, 11.4% of Aberdeen residents stated that they had a LLTI. In 2001 70.2% of Aberdeen residents felt their health had been good during the 12 months prior to Census Day; higher than the Scottish average of 67.9%. Aberdeenshire (73.6%) had the second highest figure, after East Renfrewshire (74.0%).

3.2.10 Vehicle Ownership

Car dependence is much greater in rural areas than in urban areas, with cars being regarded as essential by the majority of households. Studies have shown up to 89% of households in rural Scotland have access to a car and isolation from services appears to be the strongest determinant of car ownership, with even the least affluent in remote areas owning a car (Farrington *et al.* 1998). Many people who live in rural areas and do not own a vehicle are often dependent on others for travel to work and, particularly, the super-market. A large number of those living in rural areas are dependent on their cars because there are no viable alternatives; public transport in much of the area could not be used a reliable method of travelling to work. It is thought an increase in the cost of motoring will have a minimal impact on a majority of households due to the need to travel for work and services and the lack of alternative methods of travel. Figure 3.10 shows the levels of vehicle ownership in the East Grampian coastal area compared to Scotland as a whole.

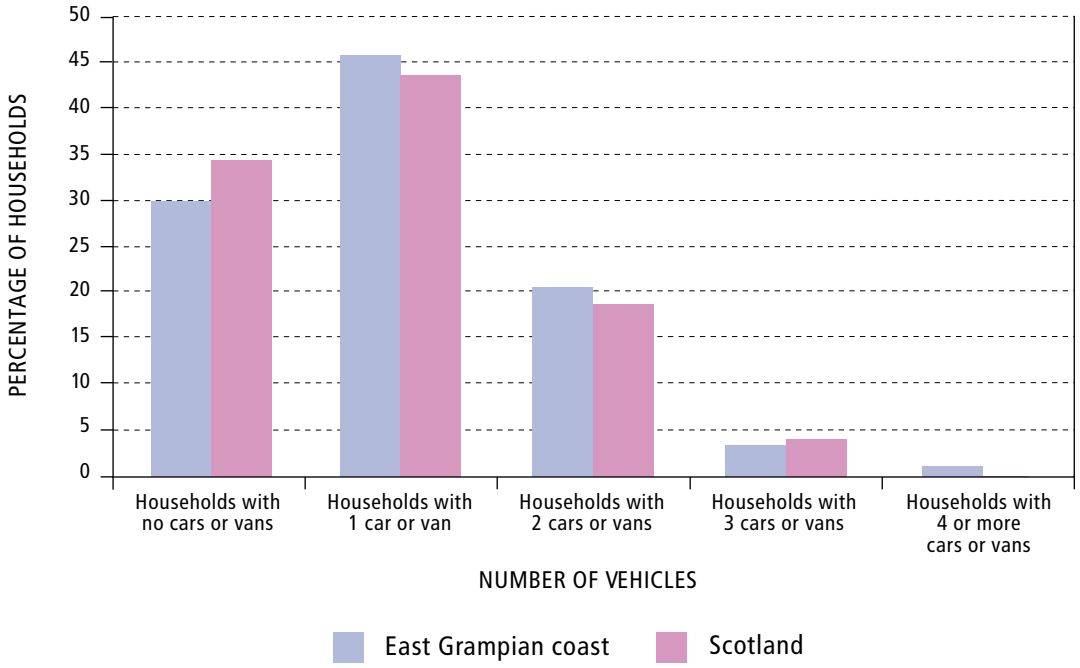


Figure 3.10 Vehicle ownership in the East Grampian coastal area, using Scotland as a comparative area

KEY SUMMARY POINTS:

- 292,920 people live within 10km of the coast between Fraserburgh and St Cyrus
- The majority of the basic demographic characteristics are in line with those for Scotland as a whole
- The main industries of employment are: health and social work (11.3%); manufacturing (10.6%); real estate, renting, business activities (14.6%); and wholesale and retail trade repairs (14.5%)
- Traditional industries including agriculture, hunting, forestry and fishing employ 1.5% of the area's population in total

SOURCES OF FURTHER INFORMATION:

- Aberdeenshire and Aberdeen City Health Information http://www.nhsgrampian.org

ACTIONS: (action partners)

- Work with local colleges and universities to promote fishing and maritime related courses (EGCP, Banff and Buchan College, University of Aberdeen)
- Support and promote events and activities which celebrate or maintain our knowledge of traditional industries (EGCP)

3.3 Access to Services

Peoples access to services is often dependant on where they live but the provision of these services is very important, especially to rural communities and many, for example post offices and primary schools are highly valued by local people (Scottish Executive, 2002). Of the key industries identified by the Scottish Executive including provision of health, education, information and advice and financial services, the coastal zone of East Grampian has relatively good access to these when compared to inland areas, with the majority of services available within a 0 – 30 minute drive time. The services are chiefly centred on the main settlement areas of Stonehaven, Aberdeen, Peterhead and Fraserburgh, with fewer services available and a longer travel time required in more rural areas. Figure 3.11 shows the information for a number of the key services, as identified by the Scottish Executive.

Figure 3.11 for the period 1999–2007 shows a slight falling trend in the number of key services within the East Grampian coastal area, for settlements with a population less than 5000. This is particularly noticeable for police, petrol stations and banks.

The provision of services is very important to the quality of life in an area, especially to those in more rural areas such as the East Grampian coastal zone. In such areas the travel times to access many of the services is higher than urban areas and those on lower incomes may find longer travel times increasingly difficult and consequently excluded from some services. For those in rural areas without access to a car, accessing services may become difficult, if not impossible if they are all centred on main settlement areas, as public transport services can be limited. The provision of locally available services will help to sustain an area's micro economy as local services provide employment for local people as well as being a more environmentally friendly option if travel times are reduced.

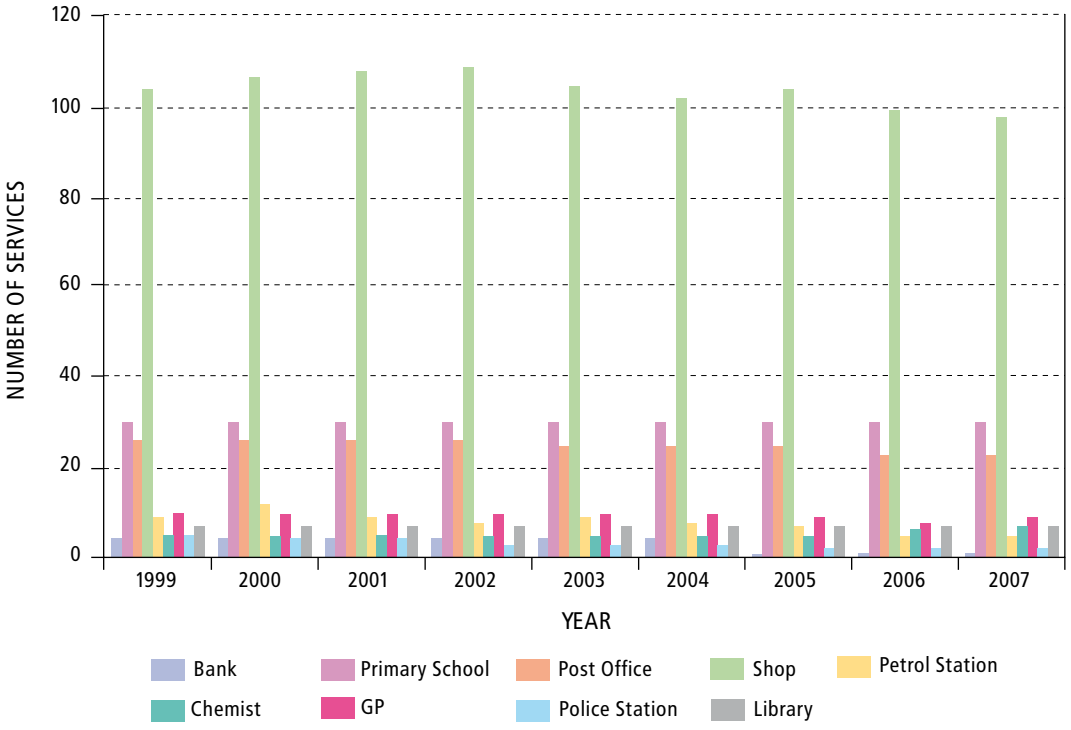


Figure 3.11 Number of key services in rural Aberdeenshire 1999-2007
(N.B. These figures are for settlements that fall within the 10km coastal boundary and where the population is less than 5000 residents)

KEY SUMMARY POINTS:

- The provision of services is seen as imperative to rural life
- Many of these are centred on the main settlements of Fraserburgh, Peterhead, Ellon, Aberdeen and Stonehaven, however access to them is good when compared to other areas of Scotland
- A slight falling trend can be seen in the number of services available since 1999

SOURCES OF FURTHER INFORMATION:

- Availability of Services in Rural Scotland, Scottish Executive
  www.scotland.gov.uk/Publications/2002/10/15646/12191

3.4 Housing

The local Housing Audit and Land Supply report (Aberdeen City and Shire, 2007) separates the area into the Aberdeen Housing Market Area (HMA) which includes Aberdeen City and part of Aberdeenshire whilst the remainder of Aberdeenshire is covered by the Rural HMA (figure 3.12).

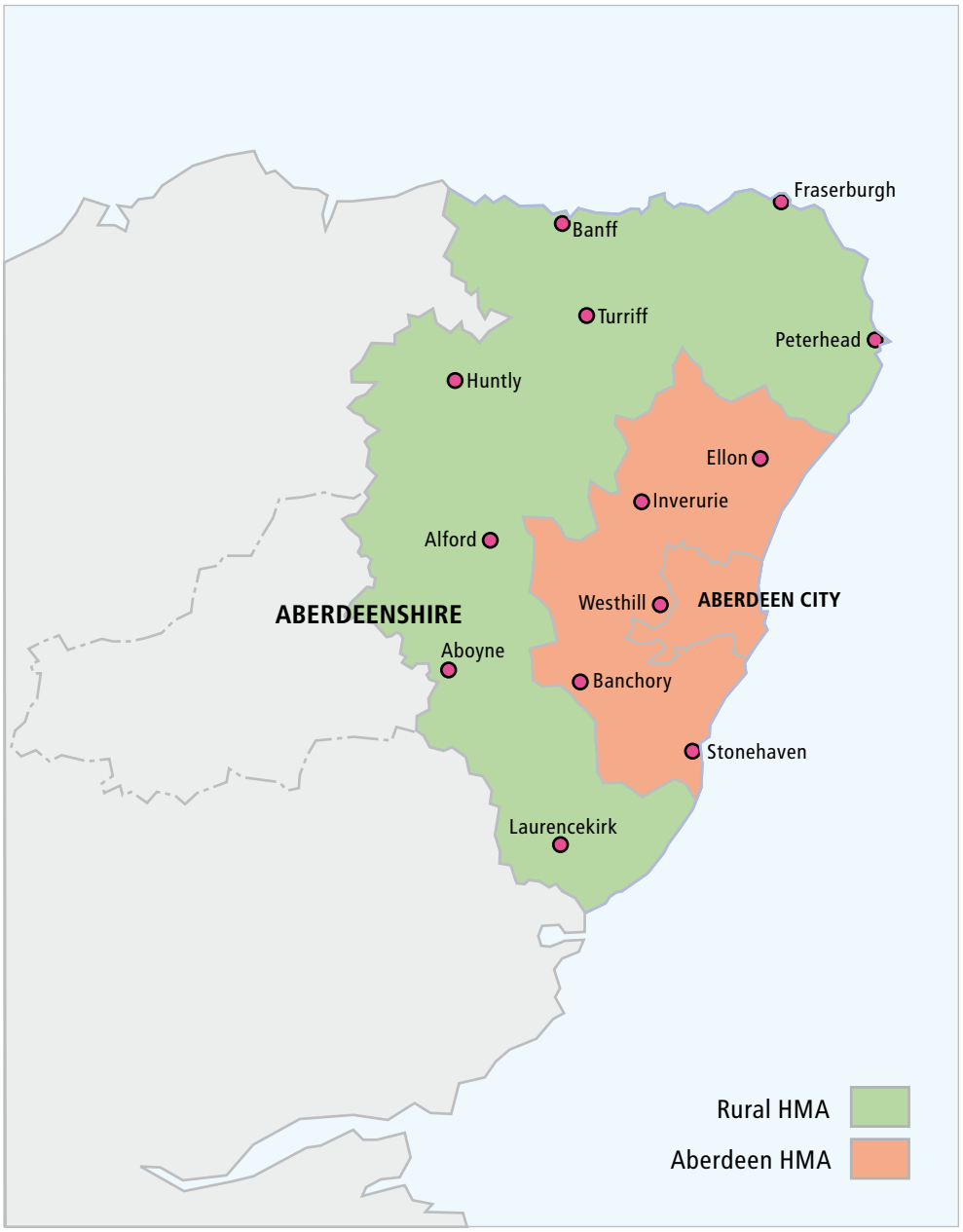


Figure 3.12 Local Housing Market Areas (Aberdeen City and Shire, 2007)

In 2007, the established land supply for housing (as shown in the Local Plan) in the Aberdeen HMA provided space for 8,016 units; a 1% fall on the previous year. The Rural HMA has a capacity for 6,782 units; also a 1% fall on the previous year. The proportion of units located on brownfield and greenfield land varies greatly between the two local authorities (figure 3.13). In Aberdeenshire, the majority of units utilise greenfield[11] sites, whilst in the City more units are located on brownfield[12] sites. This reflects the availability of the land types; with fewer brownfield sites being available in Aberdeenshire in what is predominately a rural area.

[11] Previously undeveloped land

[12] Land that was previously developed and used for industry or commercial uses which is now vacant

Area	Greenfield	Brownfield
Aberdeen City	201 (8%)	2,244 (92%)
Aberdeenshire (part)	4,672 (90%)	533 (10%)
Aberdeen HMA	**4, 873 (64%)**	**2,777 (36%)**
Rural HMA	**5,360 (88%)**	**737 (12%)**

Figure 3.13 Proportion of housing land on greenfield and brownfield sites* (Aberdeen City and Shire, 2007)

Land supply has fluctuated between 5,000 and 7,000 units in the Aberdeen HMA since 1995. Between 1995 and 1997, land supply increased by almost 30 % due to large areas of land at Kingswells and Ellon being released for development. In the Rural HMA, land supply decreased from 1995 to 1998. In 1999, however, there was an increase of almost 50% to 3,247 units following the removal of planning constraints in the Banff and Buchan area. From 2000, the supply declined but increased in 2003 and 2004. This trend continued into 2007 with another increase due mainly to rapid progress on sites and the removal of constraints. The supply has now almost doubled since 2005 which reflects increasing demand in parts of the Rural HMA.

During the period 2001–2006 the average house price rose by 43% in Aberdeen City and 44% in Aberdeenshire (SR&I, 2007). The average cost of a property in Aberdeenshire is currently £187,220, whilst in Aberdeen City it is £196,088; this is significantly higher than the Scottish average of £145,531*. Despite the current housing market collapse seen elsewhere in the country, Aberdeen HMA continues to increase, with a rise from £181,587 since the last quarter. However, there has been a small reduction in the number of properties on the register. Fraserburgh was the best performing seaside town in Scotland with an average house price increase of 46% from £69,446 in 2006 to £101,482 in 2007 (Bank of Scotland, 2008). The high prices and high demand result in more people living in the Rural HMA and commuting further distances for work.

KEY SUMMARY POINTS:

- The East Grampian coast is divided into two housing areas; the Aberdeen HMA and Rural HMA
- In 2007 there was provision for 14798 housing units, a 2% fall on the previous year
- 10233 units are on greenfield sites
- Land supply has fluctuated greatly but overall has doubled since 2005
- The average house price has risen 43% since 2001
- Fraserburgh was the best performing seaside town in Scotland in terms of increasing property value

SOURCES OF FURTHER INFORMATION:

- Housing Land Audit 2007, Aberdeen City and Shire
  http://www.aberdeencity.gov.uk/acci/web/site/Statistics/SL/stt_Home.asp

*ICZM Indicator

3.5 Road Travel

The volume of traffic on coastal roads can be used as an indicator for the number of people living in and using an area. Traffic is monitored by Transport Scotland on the trunk road network. Locally, the A90 is the only coastal road where traffic counts take place. Figure 3.14 shows the details of the counts at a number of coastal locations. From this it is apparent that all locations studied have experienced increases in the numbers of cars and vans in the period 2004–2007. This could be perceived as having a negative impact on an area due to the increased emissions, impacts to health and congestion or alternatively as an indicator of increased usage and business in the area, which can have economic benefits.

Location	Average Daily Flow (2008)	August Average			
		2004	2005	2006	2007
A90 South of Fraserburgh	6791	6703	6865	6991	7030
A90 Peterhead Peripheral South	5551	4472	4996	5447	5870
A90 Balmedie Bypass	17584	15759	15233 (May)	15928	18762
A90 Stonehaven Bypass North	24743	26620	26636	27268	28398

Figure 3.14 Traffic counts on East Grampian coastal roads *(Transport Scotland, 2008) (NB. Cars and vans only)

3.6 Traditional Maritime Connections

The East Grampian coast has long played an important role in the lives of the local communities. For centuries the sea was the mainstay of the area; providing food and employment in addition to a wealth of other environmental, cultural and economic resources. The three principle maritime industries in the area included fisheries, ship building and more recently the oil and gas industry.

Following the introduction of trawling in 1882, Aberdeen developed rapidly as a fishing port, attracting many workers to the City. In 1897, Aberdeen had 40 registered trawlers, by 1905, this had risen to 178. Around 1,000 people worked in trawling by 1900 and around 2,000 by 1910. The workforce included people who had moved in from surrounding villages and also a number of English fishermen, many of whom settled in Torry. By the early 20th century, Aberdeen was Scotland's leading white fish port.

During the mid nineteenth century, ship building in Peterhead was at its peak; by 1850 approximately six hundred men were employed in the industry. Its decline can be attributed to industrial evolutions including the introduction of steam and iron in ship building. The last vessel of its kind built in Peterhead was the *Windward*, a sailing whale ship which sailed from the port in 1893.

Several thousand ships were built in Aberdeen ranging from coastal schooners to steam trawlers. However, the last yard closed in 1992 and the City now has no shipbuilding industry. The last vessel built was *RMS St Helena*, completed in 1990; a £24 million passenger and cargo liner. Most of the shipyard sites in Aberdeen are now occupied by oil-related industries.

The production of North Sea oil began approximately 200 miles off Aberdeen in June 1975. Since then, the industry has made a huge contribution to the UK and local economy. The results of the industry can clearly been seen. At the harbour, virtually all quayside facilities were rebuilt in the 1970s and 80s. Aberdeen airport was transformed from a small regional airport into the world's busiest heliport. Dyce, Altens and Bridge of Don became sites for office blocks, pipe yards, fabrication facilities and oil majors' headquarters. There was an influx of people from elsewhere in the UK and overseas; a reversal of the historic emigration pattern. The demand for housing grew and commuter towns around the city took on a new lease of life. However, the industry collapsed in 1986 leading to 6,000 of the 28,000 offshore jobs being lost, with a further 22,000 of the onshore work-force unemployed. Since then the expected oil recovery from many fields has increased significantly, with improvements in technology allowing small, previously unachievable deposits to be exploited. The industry now employs around 260,000 people in some 6,000 companies throughout the UK, including 5% of the Scottish workforce and 20% of people in Aberdeen.

In modern society, many of the resources relied upon for centuries are subject to increasing pressures and an increasing demand. This may threaten their existence and availability to a level which can no longer sustain a strong economy. Alongside this, the nature of employment is changing as these resources diminish and more are reliant on employment which is unrelated to the maritime sectors. As such, there is a danger that the area will lose these connections as traditional settlements become commuter towns for office jobs in Aberdeen.

A number of events take place in the area each year to celebrate local traditions and to maintain the maritime culture and heritage, which may otherwise be lost. It is generally accepted that these traditions should be kept and maintained as they enrich our lives by helping us understand the past; by adding richness to the present environment; and because we feel they are to be of value to future generations. In addition to this if, in the future, we revert back to these industries, we may no longer have the skills base to support them due to a loss of knowledge.

The loss of cultural distinctiveness is used as an ICZM indicator, measured with the number of local products with Protected Designation of Origin (PDO) status. PDO is used to describe food products which are produced in a particular geographical area. In the East Grampian costal zone, no products qualify or have registered for PDO status*.

*ICZM Indicator

KEY SUMMARY POINTS:

- This area has had a long connection with the sea, with three principle industries including fisheries, ship building and the oil and gas industry
- These have all fluxed over time and led to economic collapse as well as regeneration
- Events and activities which celebrate and maintain this culture should be encouraged

SOURCES OF FURTHER INFORMATION:

- Aberdeen Maritime Museum, Shiprow Aberdeen

ACTIONS: (action partners)

- Work with local groups and harbours and encourage them to organise hands-on heritage days where knowledge can be passed to younger generations (EGCP, Harbour and Community Groups)

3.7 Public Use of the Coast

The local coast is a widely used resource and attracts a large number of visitors. However, actual numbers are difficult to obtain due to the rural nature of much of the coast in the area and the lack of facilities to monitor usage, for example car counters. As such, a number of coastal and marine related visitor attractions and events in the north east have been identified as examples of usage (figure 3.15). By looking at the visitor numbers for these it is hoped this will give an insight into the level of interest and public use of the coast.

	2000	2001	2002	2003	2004	2005	2006	2007
Adopt a beach/Beachwatch	3	57	95	184	159	208	137	155
Aberdeen Maritime Museum	68019	76402	83059	89686	89319	87373	89368	101117
Dunnottar Castle	34421	29176	32779	33785	32500	32643	38550	34158
RSPB Strathbeg				11,307	11,255	13,858	15,112	13,168
Forvie NNR		—	—					20,000*
Balmedie Country Park	—	—	—			248,544	247,008	250,000
St Cyrus NNR	3066*	4592*	3208*	5039*		18,634	17,149	18,580
Fraserburgh Lighthouse Museum	17,522	15,956	12,900	11,138	12,467	13,181	14,225	14,712

Figure 3.15 Participation and visitor numbers for local events and attractions (N.B. These figures are in some cases approximate and are based on estimates rather than actual counts) *Open May-Sept only

Figure 3.15 shows the participation levels and visitor numbers for a number of local events and attractions have remained constant or in some cases increased since 2000. Most notably, adopt a beach[13] and Aberdeen Maritime Museum have experienced significant increases. It is vital that raising awareness of the history and importance of our local coast is increased to encourage more participation.

In more general terms, tourism information is collected for Aberdeen and Aberdeenshire by Visit Scotland. This data shows a decrease in the number of visitors and in the number of tourist trips from 2005 to 2006. During 2005 it is estimated that UK residents took 1.58m tourist trips, stayed for 5.61m bednights* and spent £297m in the area. During 2006 this fell to 1.5m tourist trips, 5.3m nights* and £275m spent.

[13] An initiative involving local communities and groups in caring for their local coast

* ICZM Indicator

In 2006, 65% of trips were taken by Scottish residents whilst 33% were taken by English visitors. Overseas visitors took 0.25m trips to the area and stayed 1.8m nights. Overseas tourism spending in Aberdeen and Aberdeenshire totalled £92m; this is a considerable increase from 2005 where overseas tourism spending totalled £62m. Occupancy rates are similar to those of Scotland with hotels having an average of 66% occupancy; guest houses and B & B 46%; self catering units 49% and camp sites 44%-all of which are marginally higher than the 2005 occupancy figures*. Tourism related employment accounted for 8% of the workforce in the area. The Aberdeen Maritime Museum featured as one of the top ten destinations in the area for both 2005 and 2006. Information for 2007/08 is not available at the time of writing but will be included in future reports.

There are no tourist accommodations holding the EU Eco-Label*; five hold the Green Tourism Award.

The coast is a popular recreational and tourism resource, as many are attracted by its natural beauty, heritage and its appearance as a place of free access. The use and pressure from coastal recreation can be measured using the ICZM indicator of the number of berths and moorings for recreational vessels*. Currently there are approximately 445 berths on the East Grampian coast, though the majority of these are not specifically for recreational vessels and in many instances priority is given to local fishermen. The only official area is Peterhead marina with 175 moorings.

KEY SUMMARY POINTS:

- The nature of the coast means actual visitor numbers are not available
- Local visitor attractions have been used to gauge the level of use and show that numbers have remained constant or increased and in some cases significant increases have been seen for example numbers taking part in beach cleans
- Visitor figures for Grampian as a whole have decreased from 2005–2006, though visits from overseas tourists have increased
- Information for later years is currently unavailable

SOURCES OF FURTHER INFORMATION:

- Tourism in Aberdeen and Grampian Factsheets
  www.visitscotland.org/.../regional_facts_and_figures/

ACTIONS: (action partners)

- Promote where possible the area's maritime and coastal visitor attractions (EGCP)
- Encourage participation in adopt a beach (EGCP, MCS)
- Promote coastal related events to encourage participation (EGCP)
- Work with partners to improve access to the coast (EGCP)

*ICZM Indicator

4.0 ECONOMY

4.1 Key Industries

As shown in Part 3 of this report, the key industries of employment along the East Grampian coast include: health and social work (11.3%); manufacturing (10.6%); real estate, renting, business activities (14.6%); and wholesale and retail trade repairs (14.5%), which employ 51% of the population in total.

4.2 Port Authorities

4.2.1 Aberdeen Harbour

Aberdeen Harbour is one of the busiest Trust Ports in the United Kingdom, principally providing support for the offshore oil and gas industries as well as;

- The key commercial port in Northern Scotland
- An international port for general cargo and container traffic
- The principal mainland port for freight, passenger, vehicle and livestock services to Orkney and Shetland, with 140,000 passengers annually using the Northern Isles service*
- A major centre for forest product imports, finished paper exports and agricultural products and supplies
- A local fishing port
- A port of call for cruise ships

Being a Trust Port, all profits are reinvested for the benefit of the stakeholders of the Trust; this currently totals an investment in marine and landside facilities of £150 million since the 1970s. These investments have responded to customer needs and facilitated traffic growth. It is estimated that the Harbour provides employment for 9,330 people in Aberdeen City and a further 1,450 in Aberdeenshire resulting in approximately 11,000 Full Time Equivalent jobs in total. The economic impact of the Harbour in 2006, expressed as Gross Value Added, is estimated at £420 million (Aberdeen Harbour Board, 2007).

4.2.2 Port of Peterhead

Peterhead is a major white-fish and pelagic[14] port. The Port of Peterhead traditionally serviced the fishing industry but has since diversified to include;

- Servicing the North Sea oil and gas industry
- Cruise vessels
- Project cargo
- Recreational vessels
- Bulk cargo vessels

Peterhead has 14% of its local employment directly provided by the fisheries industry, whilst 28% of all jobs are in fishing and fishing related industries for example ship repair and distribution (Thomson, 2002). Aside from the effects of decommissioning and quota cuts, Peterhead remains a major fishing community, and in 2006 landed 46.5% of

[14] Fish found in open water away from the seabed

*ICZM Indicator

Scotland's pelagic catch and 40.4% of Scotland's total demersal[15]catch (Aberdeenshire Council, 2008) and has the largest fish market in the UK.

4.2.3 Fraserburgh Harbour

Fraserburgh Harbour is the leading Nephrop[16] (*Nephrops norvegicus*) port in the UK in terms of landings as well as having approved pelagic landing areas for large quantities of herring (*Clupea harengus*) and mackerel (*Scomber scombrus*). The harbour also serves the North Sea oil and gas industry. Last estimates showed approximately 45% of the working population in the Fraserburgh area are either directly or indirectly related to the fishing industry, with the harbour at the centre of this. Fraserburgh Harbour is also a Trust Port and stands or falls on the revenues it generates. Approximately 95% of that revenue is derived from the fishing industry with only a small percentage coming from commercial trade. All profits generated in the port are re-invested in port infrastructure; it is estimated over £40 million has been spent during the past 25 years (Ironside, pers. comm. 2008). General economic information for the three ports can be seen in figure 4.1.

	Aberdeen			Peterhead			Fraserburgh		
	2004	2005	2006	2004	2005	2006	2004	2005	2006
Imports and Exports (million tonnes)	4.7	4.85	5.11	0.856	1.06	1.04	0.100	0.100	0.100
Vessel Arrivals	8,334	8,335	8,433	1,754	1,467	2,131	7,500	7,500	7,500
Tonnage of Shipping (million tonnes)	21.1	21.7	23.46	4.5	4.1	6.2	0.100	0.100	0.120
Turnover (£million)	18.3	19.61	20.09	5.3	5.6	6.4	2.25	2.25	2.5
Pre-tax Profit (£million)	6.9	5.61	9.03	1.1	1.8	2.5	0.200	0.200	0.200

Figure 4.1 Economic information for the ports of Aberdeen, Peterhead and Fraserburgh, 2004-2006 *

KEY SUMMARY POINTS:

- The East Grampian coast is home to three of the largest ports in the UK and some of the largest in Europe
- Main business includes servicing the fishing and oil and gas industries; freight; passenger and vehicle ferries; and as a port of call for cruise ships
- Large proportions of the population are employed by the ports who also contribute greatly to the economy of an area

SOURCES OF FURTHER INFORMATION:

- Economic Impact Assessment of Aberdeen Harbour, Aberdeen Harbour Board http://www.aberdeenharbour.co.uk/downloads/Economic%20 Impact%20 Study%20200607.pdf
- Fisheries Bulletin, Aberdeenshire Council www.aberdeenshire.gov.uk

[15] Fish found near to the seabed
[16] A type of small lobster

4.3 Sustainability of Community Harbours

The East Grampian coast has 12 harbours along its length, many of which were established to support the local fishing industry and to service community based fishing fleets. The advent of large fishing vessels rendered many of the small harbours unsuitable for their original purpose, and subsequently diverted much of the local fishing industry to the larger ports in the area.

Today, a number of the small harbours have fallen in to various states of disrepair and without remedial works, may be lost as coastal assets. The harbours are a way of remembering the past and preserving the area's maritime heritage. At the present time they also support small numbers of local fishermen, who without local harbours would not be able to continue to fish due to a lack of alternative, affordable berths. These harbours are run either by Harbour Trusts or Local Authorities. Where the Harbour Trusts assume ownership, Local Authorities do not generally provide financial assistance to their running or repair. The Harbour Trusts must self fund this work and rely on harbour fees, external funding and fundraising events to generate the income needed.

In the area from Fraserburgh to St Cyrus the following harbours are run by the local communities and Harbour Trusts: Cairnbulg; Boddam; Port Erroll; Collieston; Catterline and Cove. The long term sustainability of these harbours is dependant on the finances available to them and the efforts of the local communities with regard to fund raising. A number of different funding opportunities are available for the harbours including the National Lottery, Corporate Responsibility funding, Scottish Government as well as the Landfill Communities Fund.

Following the Saving Small Harbours Report (Bell, 2007), a number of recommendations were made for Port Erroll and Collieston Harbours (the focus of the report) which have been actioned below. It is hoped the report and its recommendations can be of use to the other community harbours in the area.

KEY SUMMARY POINTS:

- There are 12 harbours along the East Grampian coast, 6 of which are owned and managed by local communities
- These harbours are in various states of repair but the funding for this must be raised by the communities themselves

SOURCES OF FURTHER INFORMATION:

- Saving Small Harbours Report (Bell, 2007) – East Grampian Coastal Partnership www.egcp.org.uk/EGCPPublications

ACTIONS: (action partners)

- Work with local communities where required to obtain Harbour Revision Orders to change their constitutions from 'for profit' to 'not for profit' organisations to aid funding (Harbour Groups, EGCP)
- Harbours to consider Company Limited by Guarantee or a Scottish Incorporated Charitable Organisation status, to aid the running of the Trusts and improve the success of funding applications (Harbour Groups)
- Submit an application for a Rural Seaside Award for Collieston to strengthen their funding applications (EGCP, Collieston Amenities Group)

4.4 North Sea Oil and Gas

4.4.1 Oil and Gas Production

The production of North Sea oil has declined in recent years; in 2003 average output was in excess of 2.2 million barrels per day (mbpd), however since then a steady decline has been seen with average production falling below 1.5mbpd in the first quarter of 2007 (figure 4.2). Between March 2006 and March 2007, production fell by 14%. Despite increased drilling activity, "the underlying long-term decline in production is unlikely to be reversed" (RBS Oil & Gas Index, May 2007).

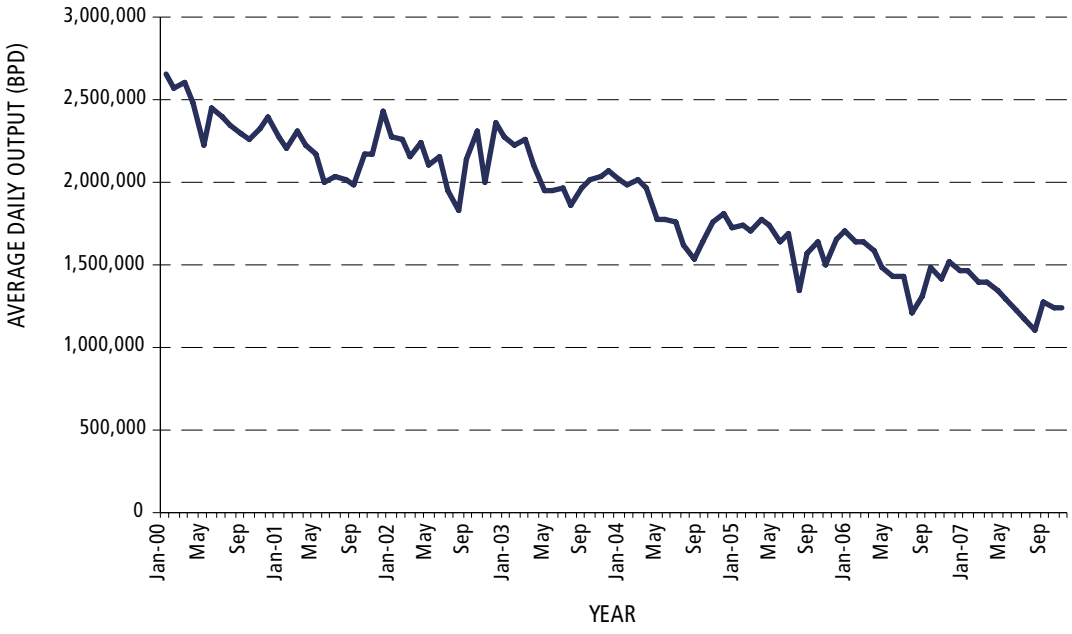


Figure 4.2 Oil Production 2003–2007 (ACSEF, 2007)

North Sea gas currently provides for 40% of the countries energy demand, though production from the UK is now in decline and a greater proportion of future requirements will have to be met from imports. The St Fergus Gas Terminal near Peterhead currently receives and processes around 20% of the UK's daily gas requirements from over 20 North Sea fields.

Whilst there has been a large extent of instability in the gas prices, declining oil production had led to a sharp rise in costs per barrel produced, keeping the price high throughout 2007. However, the recent economic downturn has led to prices falling from a high of $147/barrel in July 2008 to $34/barrel in December 2008 and predictions for 2009 remain low at $30–45.

4.4.2 Sales

As well as being the centre of the UK oil and gas industry, Aberdeen also plays an important role in international operations as shown in the 2005/06 Scottish Council for Development and Industry Survey of International Activity in the Oil and Gas Sector (SCDI 2007). Although the survey covers oil and gas exports for Scotland as a whole, the findings are particularly relevant to the North East, as many of Scotland's oil and gas service and supply firms are located here.

The survey valued direct exports (including production and services that are supplied or managed from Scotland) from Scottish-based operations at £1,898 million in 2005, an increase of 2% on the 2004 figure. The survey also looked at international sales which are generated via overseas subsidiaries with Scottish based headquarters. Sales in this sector rose to £1,856 million in 2005, an increase of 4% on 2004. In total, internationally derived sales from the Scottish oil and gas industry in 2005 were £3,754 million (Figure 4.3).

Activity	2003 (£M)	2004 (£M)	2005 (£M)
Direct Exports	1,605	1,861	1,898
Sales via Subsidiaries	1,788	1,793	1,856
Total International Activity	3,393	3,654	3,754

Figure 4.3 Oil and Gas International Sales, Scotland (SCDI, 2007)

4.4.3 Workforce

The total employment provided by the oil and gas sector in the UK has risen to 480,000 personnel including:

- 30,000 directly employed in oil and gas companies and major contractors;
- 260,000 employed in the wider oil and gas sector supply chain, and;
- 100,000 jobs supported by economic activity induced by oil and gas employees spending throughout the wider economy.

In Scotland there are currently in excess of 100,000 skilled oil and gas jobs and approximately 150,000 jobs in total. Four parliamentary constituencies in the Aberdeenshire area account for 38% of all UK jobs supported by the oil and gas industry (ACSEF, 2007).

The Aberdeen and Grampian Chamber of Commerce reported positive employment trends in the 2007 Oil and Gas survey, with the majority (71%) of operators anticipating increasing employment figures over the next 12 months though falling prices may have a detrimental effect on this. Some easing of demand is expected in 2009, though 40% of operators nevertheless expect worked hours to be in excess of those planned however some reduction in the use of contract and temporary staff is likely.

4.4.4 Training and Skills Shortages

There have been a number of significant industry commitments in terms of centres of excellence and training programmes, as well as new facility developments and related investments in the North East. In June 2006, a multi-million pound training programme was launched in Aberdeen in an attempt to address immediate skill shortages within the industry.

The high level of activity seen in the oil and gas industry has lead to a high demand for skilled labour. This has raised concerns over the demographics of the current workforce. Recent research has shown that the average age for the UK industry is 41, rising to 43 for offshore workers. Figure 4.4 shows the age profile for industry workers and highlights the aging workforce and the under representation by under 24 year olds. However, as this is often a very competitive sector, many under 24 year olds may still be in full time education to gain the necessary qualifications before entering the workforce.

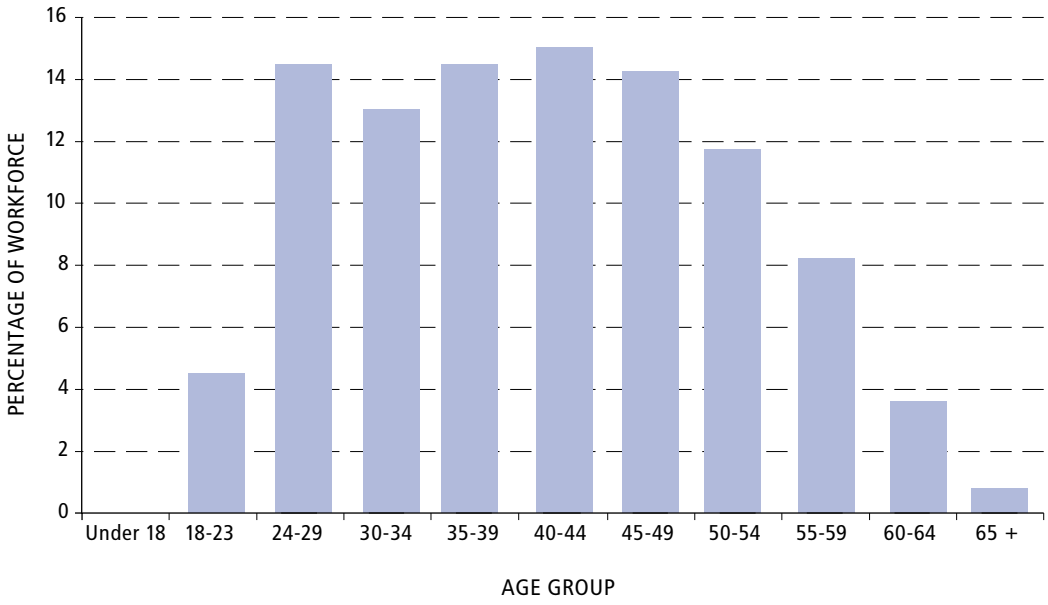


Figure 4.4 Age profile of industry workers (Oil & Gas UK, 2007)

The number of females employed by the offshore industry is slowly increasing. In 2006, approximately 1,800 female personnel worked offshore with significant numbers performing technical roles. The age profile for female workers is slanted towards the younger age groups, with an average age of 34 years.

KEY SUMMARY POINTS:

- A decreasing supply of oil and gas has led to increasing prices
- Employment figures have recently risen with employers expecting this to continue in the short term
- Skilled worker demand is high, though there are concerns over the demographics of the work force

SOURCES OF FURTHER INFORMATION:

- Energy Review 2007, ACSEF www.neser.org.uk/pdf/acs_energyreview2007.pdf

ACTIONS:

- Work with the University of Aberdeen and Banff and Buchan College to promote maritime related degrees (EGCP)

4.5 Fisheries

4.5.1 Fisheries Industry

The fisheries industry has been subject to fishing quotas, decommissioning schemes and a cut in the number of permitted days at sea in an attempt to manage stocks sustainably. Recent data has shown local ports to be performing well, with pelagic and shellfish landings achieving high prices; the ports of Aberdeen City and Shire have performed better than any other in Scotland (Aberdeenshire Council, 2008). The ports in the north east landed over 151,000 tonnes of fish in 2006; a 20% drop compared to 2005, mainly due to reduced pelagic and demersal landings whilst catches of shellfish rose. Despite this short term decline, the North East tonnage has increased since 1995, with the ports contributing 52.5% and 36.5% respectively of all Scottish and UK landings.

In the North East there has been approximately a 40% reduction in fisheries employment overall; some of this can be attributed to larger, fewer boats in operation which require fewer fishermen, rather than a decline in the industry. During the period 1996-2006, Fraserburgh (including the ports of Fraserburgh, Gardenstown, Macduff, Pennan, Portsoy, Rosehearty, Sandhaven and Whitehills) saw a 46.7% drop in fishermen; Peterhead (Peterhead, Port Errol and Boddam) suffered a 41.2% drop whilst Aberdeen (Aberdeen, Catterline, Gourdon, Johnshaven, Stonehaven, Montrose and Arbroath) saw an increase of 3.2% fishermen (Aberdeenshire Council, 2008). Overall there is a decline in the numbers employed in the industry (though not in all local ports) (figure 4.5) and action is required to highlight its good work in terms of ensuring integrated and sustainable fisheries and its long term career potential to maintain and increase those numbers.

Aberdeen	Scottish Vessels	Scottish Landings (tonnes)	Scottish Landings (£'000)	Fishermen Employed
2006	93	16,296	13,635	162
2005	93	24,665	14,518	163
2004	91	21,529	15,099	157
2003	89	13,649	13,092	153
Peterhead				
2006	99	101,866	83,424	457
2005	98	115,688	79,512	273
2004	102	112,180	62,670	417
2003	112	89,290	50,713	414
Fraserburgh				
2006	221	29,382	51,732	763
2005	217	46,101	51,049	764
2004	219	42,379	36,588	725
2003	222	43,891	31,031	808

Figure 4.5 Changes in the local fishing fleet (Scottish Executive, 2000–06)

4.5.2 Main Species

The main target species for east coast fishing vessels and their current status for the North Sea are shown in figure 4.6 using IUCN and ICES data. The IUCN (International Union for the Conservation of Nature) Red List has been in existence since 1963 and is used to evaluate the conservation status of species on a global scale. ICES (International Council for the Exploration of the Sea) are the major source of information for member states on the marine ecosystem of the North Atlantic Ocean and adjacent seas. From this information it is apparent that the majority of the species are either listed as at risk with poor recruitment and low spawning stock or uncertain as insufficient information exists for that species to determine their status. Much work has been carried out however, to gauge and improve the stocks including Regional Advisory Councils which were set up to manage stocks in a sustainable way whilst allowing greater stakeholder input.

Species	IUCN Red List Status	ICES Status	Spawning Stock Biomass (tonnes)	Recruitment
Atlantic cod *Gadus morhua*	Vulnerable	At Risk	Below precautionary limit	Low
Haddock *Melanogrammus aeglefinus*	Vulnerable	Full Reproductive Capacity	238,000 (above precautionary limit of 140,000)	Poor
Whiting *Merlangius merlangus*	Not Listed	Inadequate Information	Uncertain	Very low
Saithe *Pollachius virens*	Not Listed	Full Reproductive Capacity	Above precautionary limit of 200,000	Poor
Monkfish *Squatina aculeata*	Critically Endangered	Not Listed	Major uncertainties	Major uncertainties
Herring *Clupea harengus*	Not Listed	Reduced reproductive capacity	1.2 million (below precautionary limit 1.3 million)	At its weakest since 1970s
Mackerel *Scomber scombrus*	Not Listed	Harvested unsustainably	Stable but uncertain how compares to precautionary level of 2.3 million	Variable
Norway lobster *Nephrops norvegicus*	Not Listed	Stable	Uncertain	Low

Figure 4.6 Target Species for east coast fishing vessels *

N.B. Information based on IUCN, ICES and FRS fisheries data. A taxon is Vulnerable when it is facing a high risk of extinction in the wild in the medium-term future, a taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future. Other data does exist which contradicts ICES and IUCN.

KEY SUMMARY POINTS:

- The introduction of quotas, decommissioning schemes and a cut in the permitted days at sea has effected the industry
- Landings and employment figures appear stable
- The fleet has decreased by 26% since 1996
- Many of the target species have been identified as at risk though uncertainties do exist

*ICZM Indicator

SOURCES OF FURTHER INFORMATION:

- Scottish Fisheries Statistics www.scotland.gov.uk/Publications/Recent
- Fishing Industry Statistics, Volume and Value of Landings www.aberdeenshire.gov.uk/statistics/economic/fishing/index.asp
- Fishing Industry Statistics, TACs and Quotas 2008 www.aberdeenshire.gov.uk/statistics/economic/fishing/index.asp
- Fishing Industry Statistics, Employment and Fleet Size www.aberdeenshire.gov.uk/statistics/economic/fishing/index.asp

ACTIONS: (action partners)

- Promote good fishing practices to recreational fishermen (SSCAN, EGCP)
- Promote the Marine Stewardship Council's sustainable fishing standards to inform shoppers of sustainable species (EGCP)

4.6 Coastal and Offshore Renewable Energy Production

The north east currently has very little in the way of coastal and offshore energy production though there is potential for this to change in the future. The Scottish Government have announced their commitment to producing 20% of Scotland's total energy use from renewable sources by 2020. They have confirmed that existing technologies are unlikely to be able to meet this demand and that new technologies including wave and tidal power generation will be required. Figures 4.7 – 4.9 show the potential for wave, tidal and offshore wind power generation in this area and how that compares to the UK.

Figure 4.7 shows the mean spring tidal range to be 3.01 – 4.00m. It is generally accepted that tidal ranges of 8.00m or more would produce an energy efficient output (ABPmer 2008). These tidal ranges are not found along the East Grampian coast but are centred on some of the larger estuaries and areas where water flow is restricted including the Irish Sea, Bristol Channel and the English Channel. Given the tidal range in this area and current technology, it is unlikely the East Grampian coast will be subject to any tidal energy developments.

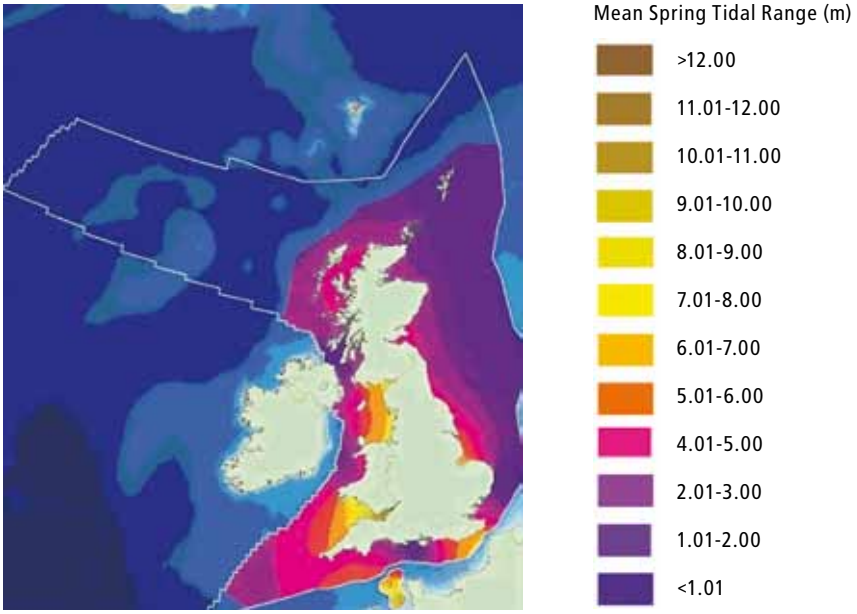


Figure 4.7 Mean spring tidal range (BERR, 2008)

Wave climates which are suitable for energy production have average annual power levels of 20 – 70KW/m of wave crest (ABPmer 2008). The seas around the East Grampian coast have wave powers between 5.1 and 20.0KW/m of wave crest although this varies with the seasons (figure 4.8). Given this power and current technologies it is unlikely the local area will see much in the way of power generation from wave power and its associated development. However, as with all renewable energies, the technology is still developing and it the future it may become economically viable to generate energy from lower wave power.

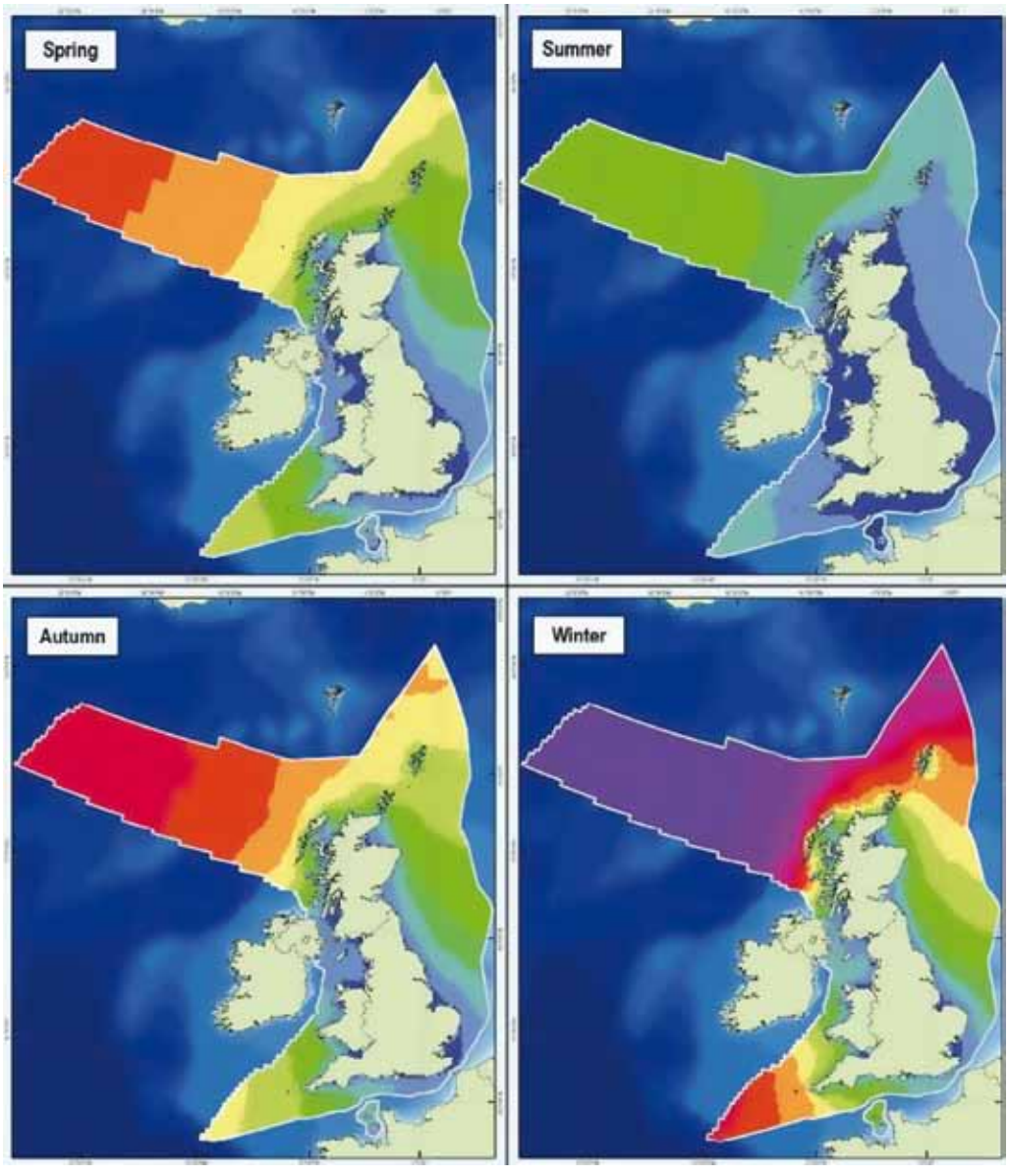


Figure 4.8 Seasonal Mean Wave Power (BERR, 2008)

The majority of wind turbines start to generate electricity at winds speeds of 3 – 4 metres per second (m/s); they generate maximum power at 15m/s and shut down at 25m/s to prevent damage (ABPmer 2008). The East Grampian coast has annual mean wind speeds of between 7.1 and 10.0m/s (figure 4.9), with speeds of up to 13m/s during the winter months. The seas are also shallow, making this area ideal for wind energy generation.

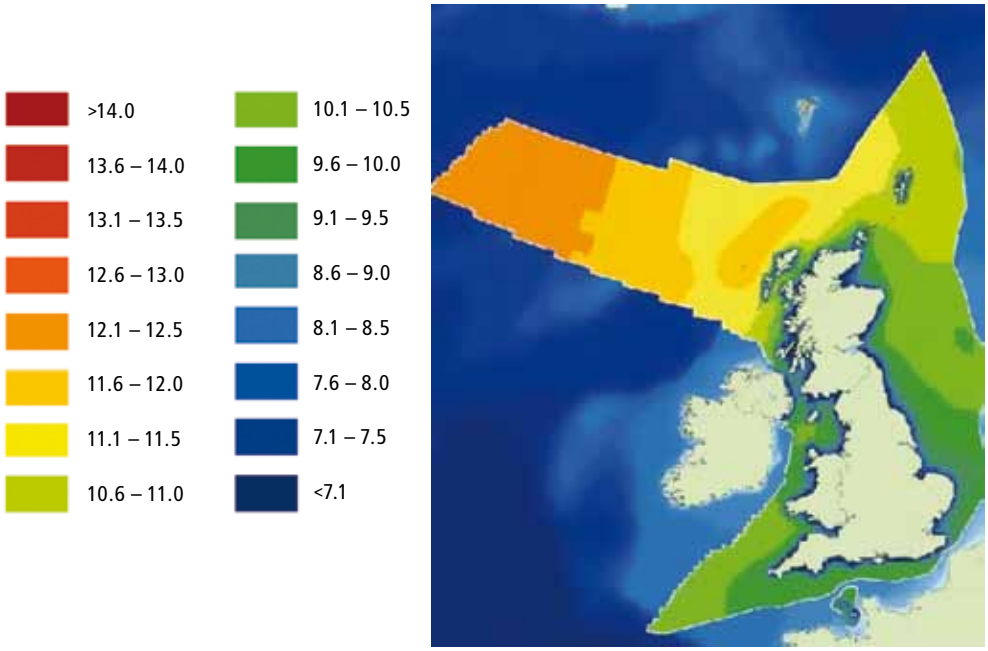


Figure 4.9 Annual Mean Wind (m/s) Speed at 100m (above sea level) (BERR, 2008)

Interest has been shown by the Aberdeen Renewable Energy Group for a windfarm off of the coast of Aberdeen and Aberdeenshire, with 23 turbines in a grid formation covering an area of 2km by 4km. The group is currently undertaking a feasibility study for the development. There has been a mixed response to the project due to the already high number of users which utilise the area, as well as the potential environmental threats including those to bird populations and cetaceans.

The Government is committed to extensive use of renewable energy; a target of 10% of UK electricity coming from renewable sources by 2010 has been set. Additionally, the Scottish Government has pledged that 50% of Scotland's electrical energy should come from renewable sources by 2020. It is thought that the Aberdeen City and Shire area is well placed to play a leading role in developing renewable energy technologies due to its geography and close links with the renewable energy industry with a number of major companies being located in Aberdeen.

KEY SUMMARY POINTS:

- The north east currently has very little in the way of coastal and offshore energy production however this may change in the future
- Given the tidal range in this area and current technology, it is unlikely the East Grampian coast will be subject to tidal energy developments
- Given wave power and current technologies it is unlikely the local area will see much in the way of power generation from this source
- The East Grampian coast has annual mean wind speeds of between 7.1 and 10.0m/s, with speeds of up to 13m/s during the winter months combined with shallow seas, making this area ideal for wind energy generation.

SOURCES OF FURTHER INOFRMATION:

- Marine Renewable Energy Resource Atlas-The British Wind Energy Association http://www.bwea.com/marine/atlas.html
- Securing A Renewable Future: Scotland's Renewable Energy – the Scottish Government http://www.scotland.gov.uk/Publications/2003/03/16850/20554

ACTION POINTS:

- Monitor the progress of the offshore wind development in Aberdeen Bay

5.0 ENVIRONMENT

The resources gained from the marine and coastal environment in this area are central to the lives of many people. As shown in Part 1, a healthy environment is required to maintain fully functioning ecosystems as well as for employment opportunities, food provision and recreation opportunities. By gathering the information and data in the following sections it will allow us to assess the health of the coastal and marine environments and where necessary, action work for areas in need of improvement.

5.1 Geography and Geology

The East Grampian coastal zone covers an area of 1137km^2, with a coastal length of approximately 160km*. Much of this (1044km^2) is classified as rural (localities with less than 1000 residents), with 92.6km^2 classified as urban, the remaining area (0.08km^2) is covered with lochs*. The land coverage* is chiefly made up of arable (62%), grassland (17.4%), urban (6.7%) and woodland (6.1%), with the remaining 8% made up of numerous land types (figure 5.1 – 5.3*).

The physical landscape is predominantly open, lowland and rolling. The key land use is agriculture, with little in the way of natural or semi natural vegetation or habitat remaining. The coastline however, is a contrast to this. Much of the East Grampian coastline is dramatic and bordered by a narrow strip of near natural habitat and includes sea cliffs such as those to the south of Aberdeen and extensive coastal dune systems for example Sands of Forvie and Rattray Head. These are hinged on low bedrock outcrops and glacial deposits, which have allowed sand deposits to accumulate. Fluvial inputs[17] are locally significant, though their supply of new beach material is limited. Sections of the coast are designated at a national or international level for nature conservation, landscape and heritage value and cover an area of 5273 hectares* (figure 5.4 – 5.6). These sites are overseen by SNH who carry out monitoring to determine their condition. Of the designated sites within the 10km boundary, 38% of the features hosted by the sites are listed as unfavourable in the most recent condition assessment*. Sections of coast also have local designations for example District Wildlife Sites (DWS), Local Nature Reserves (LNR) and Sites of interest to Natural Science (SINS). These sites are allocated and managed by local authorities.

[17] Those deposited by rivers and streams

* ICZM Indicator

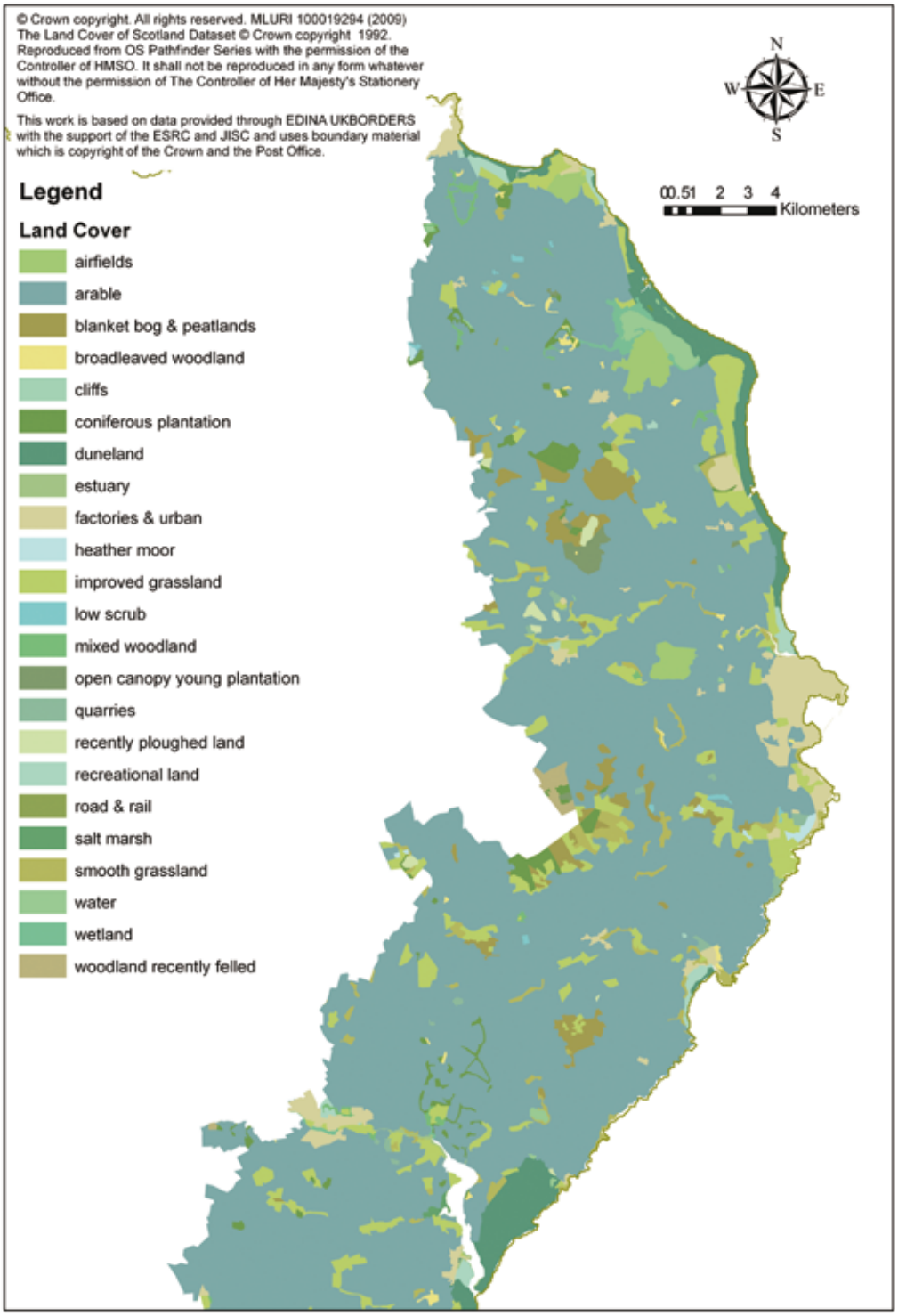


Figure 5.1 Land cover of the East Grampian coast-Aberdeenshire North (MLURI, 1992)

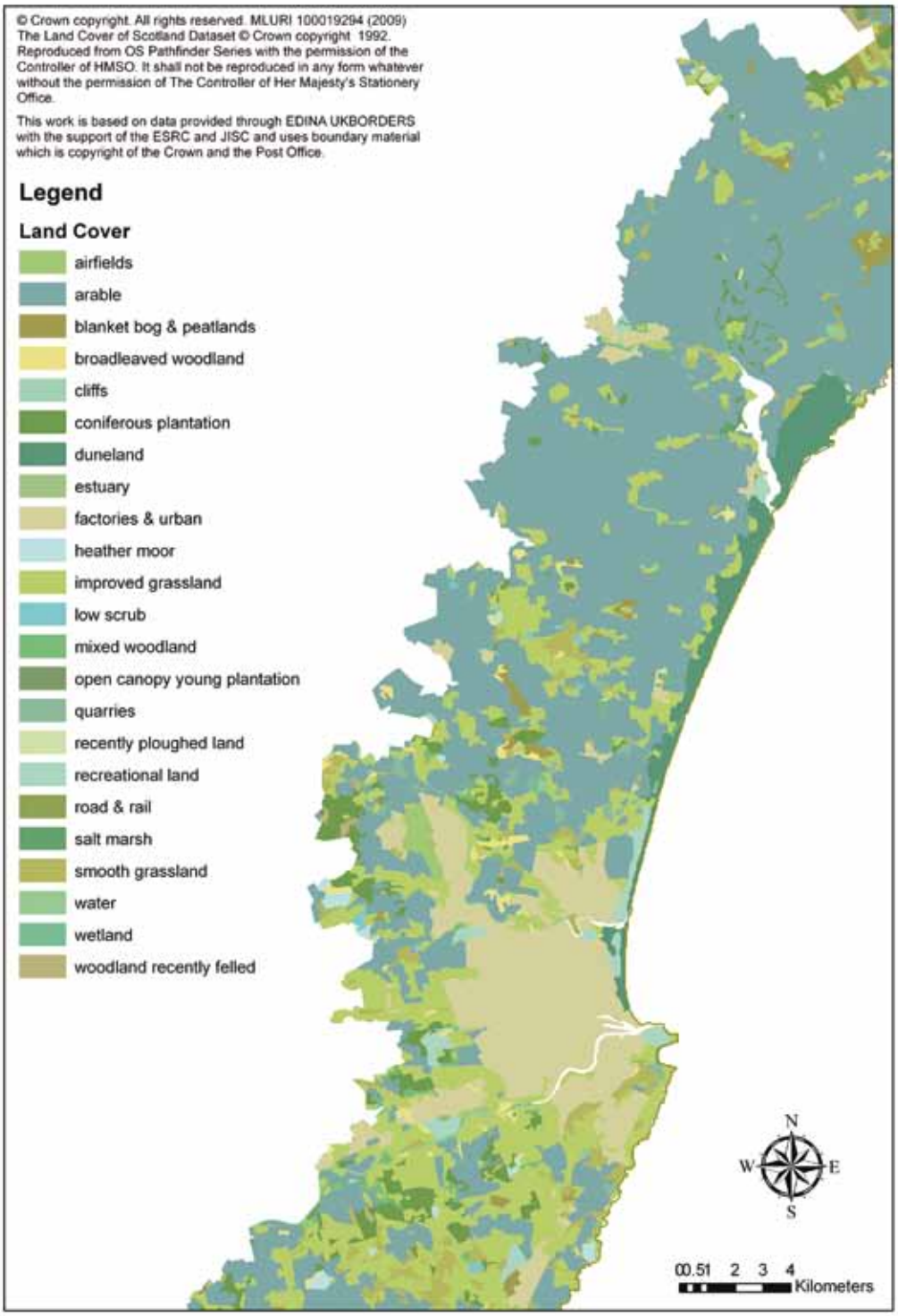


Figure 5.2 Land cover of the East Grampian coast-Aberdeen City (MLURI, 1992)

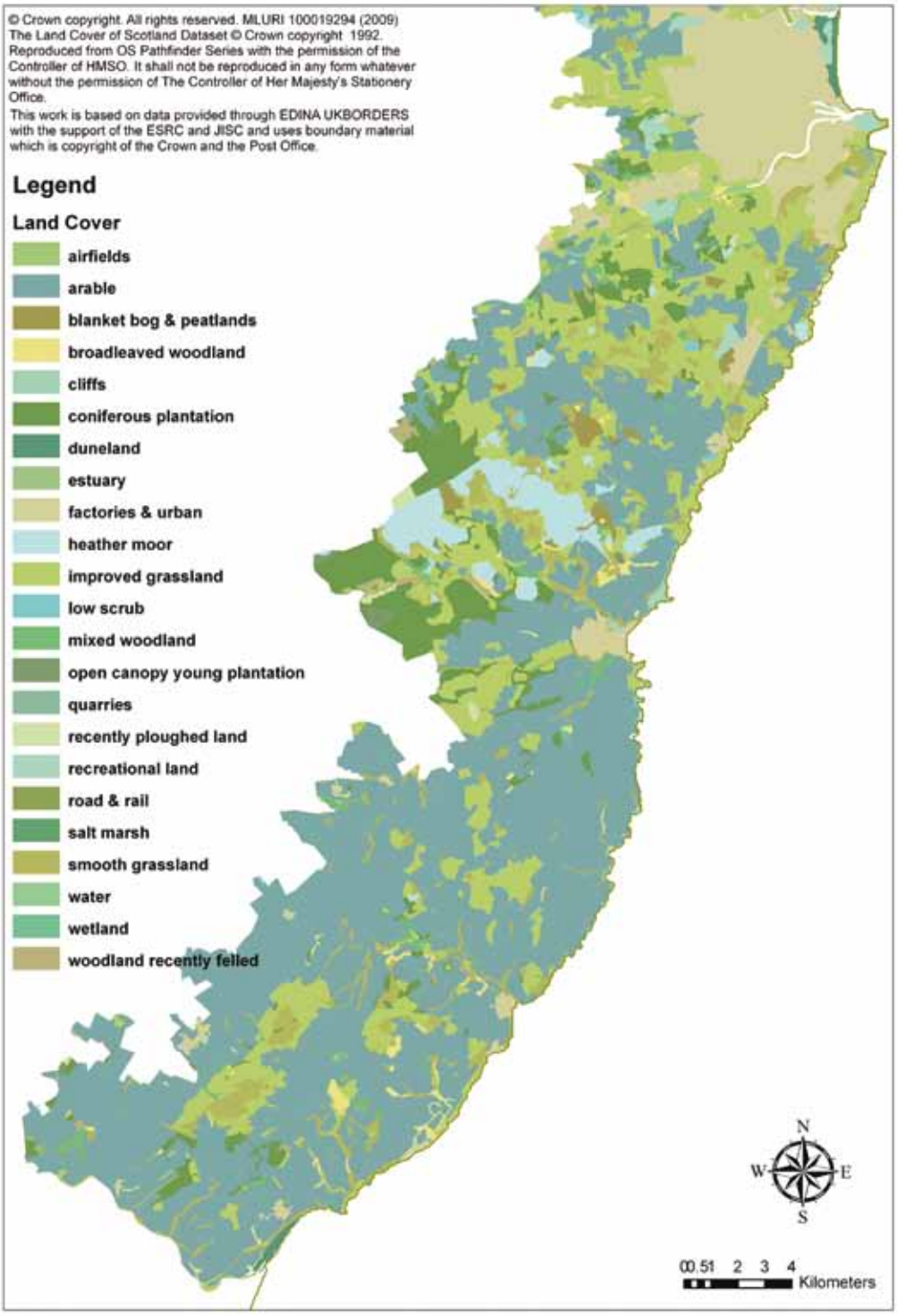


Figure 5.3 Land cover of the East Grampian coast-Aberdeenshire South (MLURI, 1992)

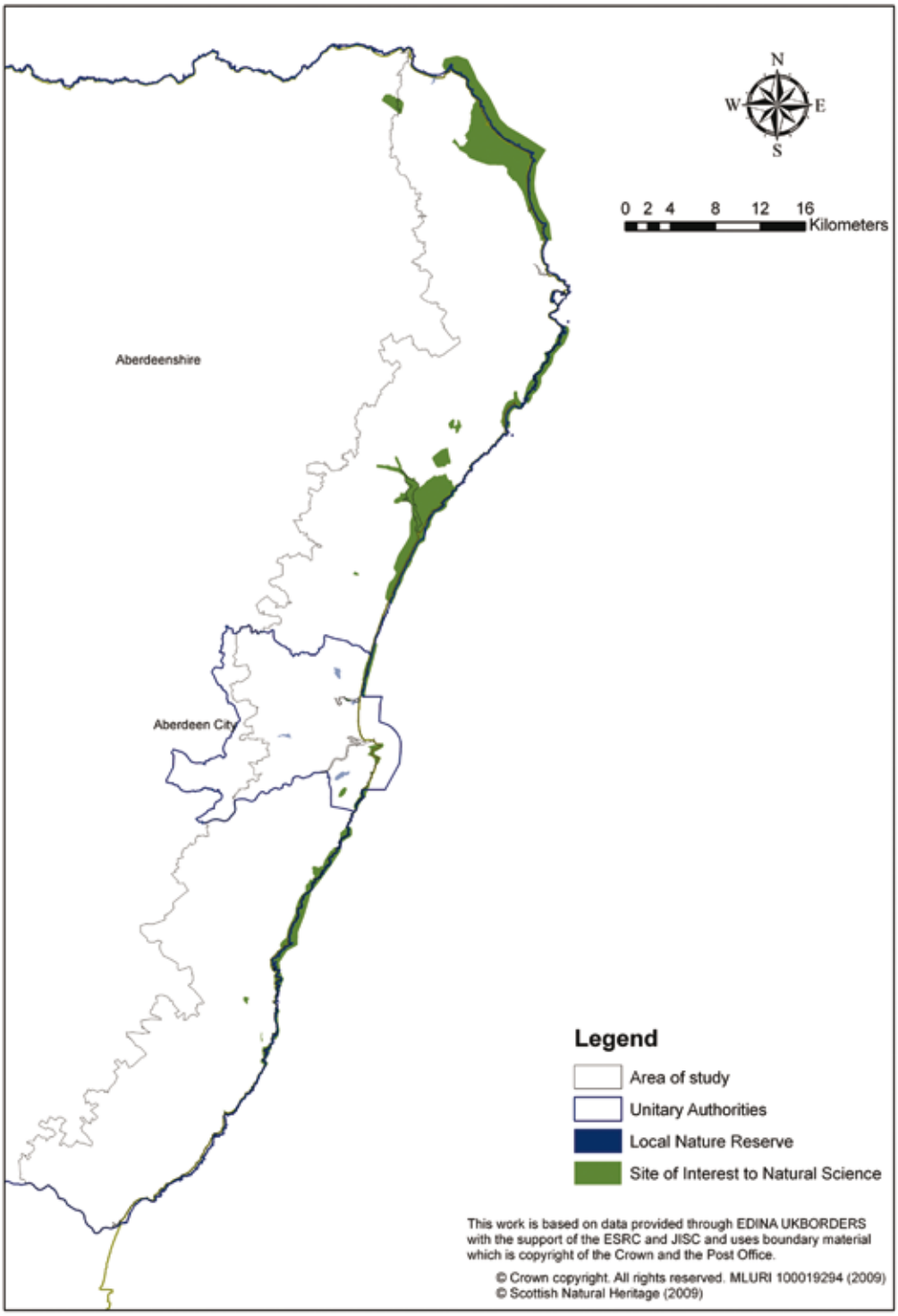


Figure 5.4 Protected areas in the East Grampian coastal zone-Local level (OS, 2009a and SNH, 2009)

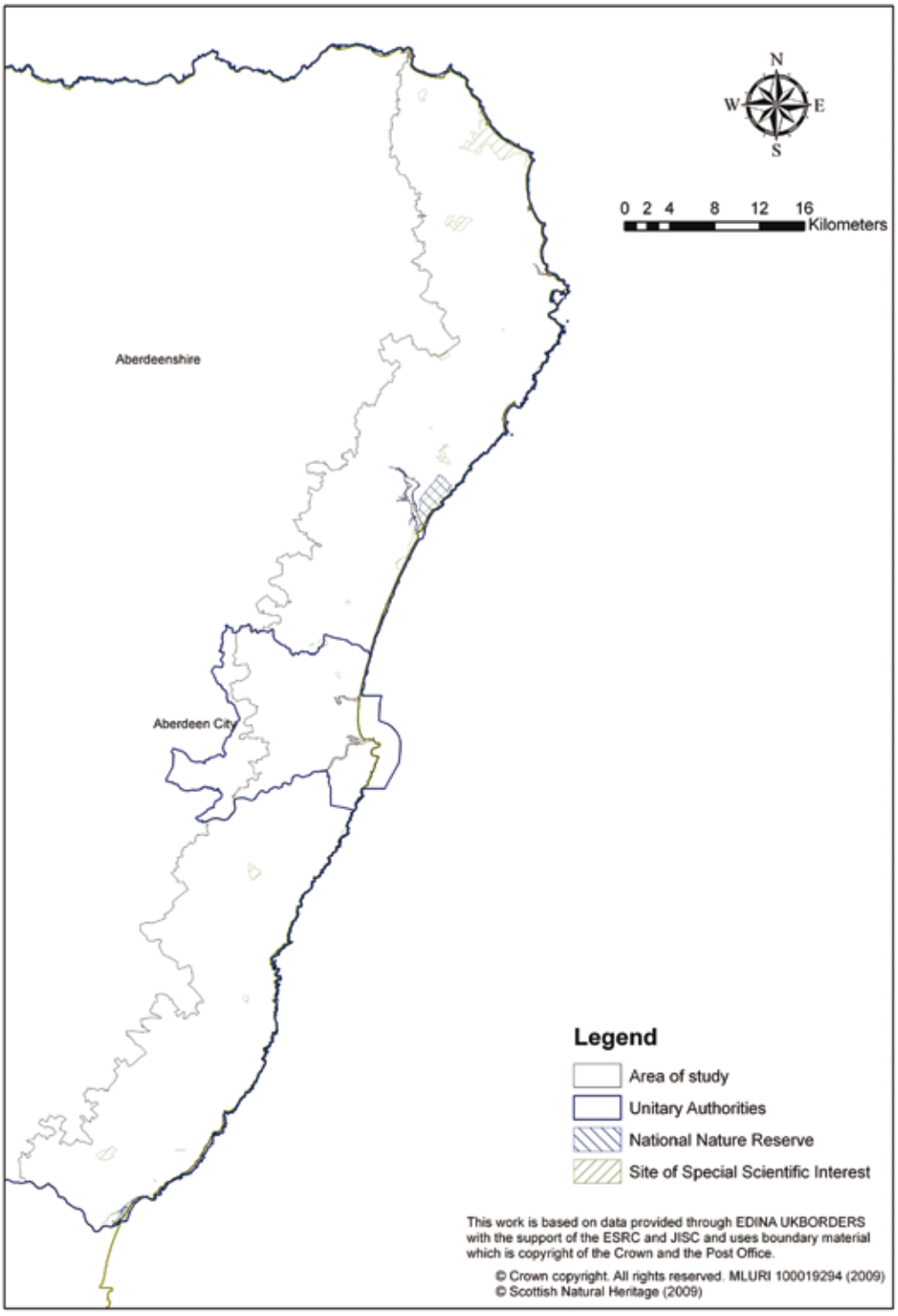


Figure 5.5 Protected areas in the East Grampian coastal zone-National level (OS, 2009a and SNH, 2009)

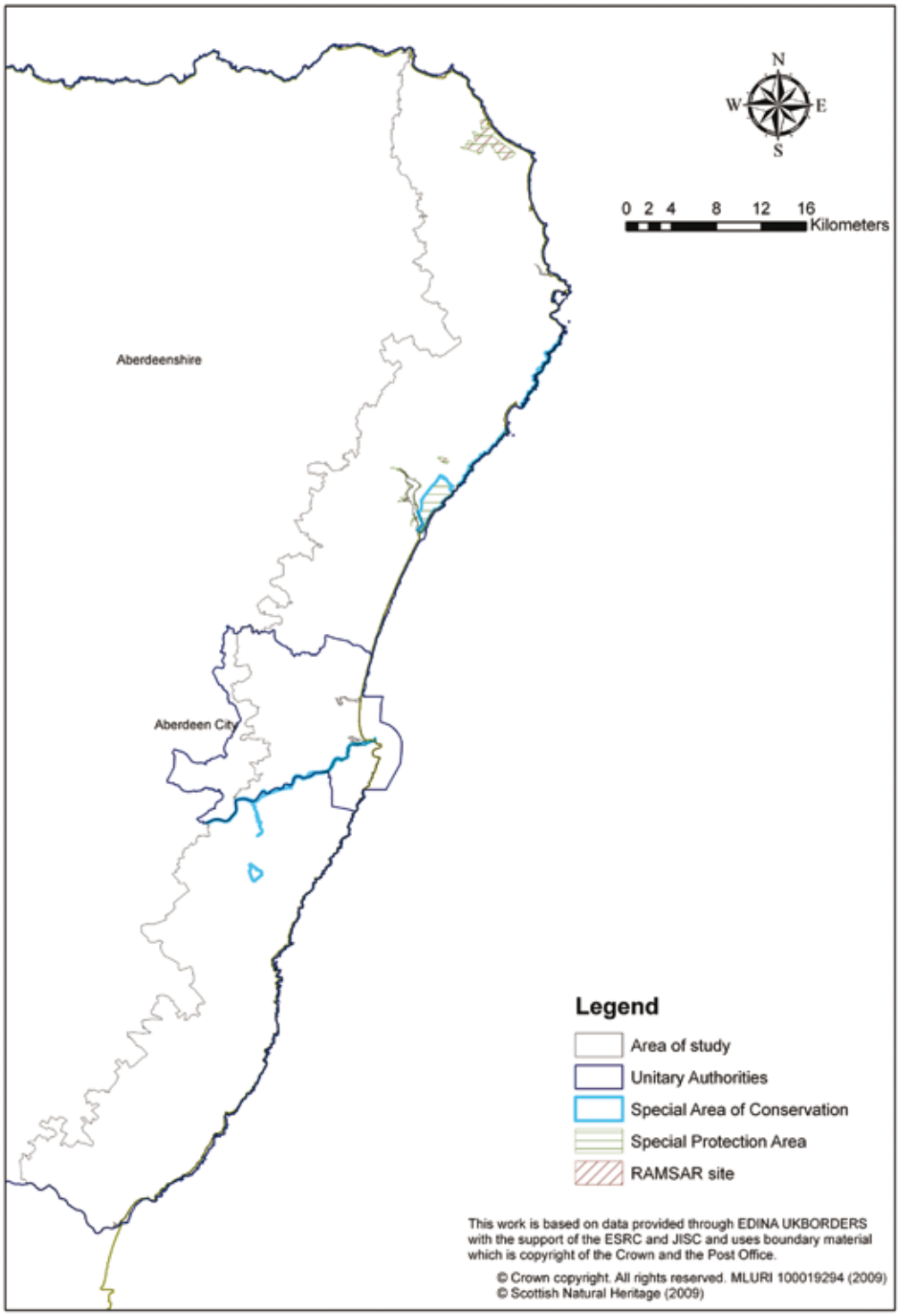


Figure 5.6 Protected areas in the East Grampian coastal zone – International level (OS 2009a and SNH, 2009)

The coastline of East Grampian is made up of Dalradian metamorphic rocks and Caledonian intrusive igneous rocks (figure 5.7) and can be further split into two separate geological areas, comprising of the granites, gneisses and schists of the Aberdeenshire coast to the north of the Highland Boundary Fault and the younger sedimentaries to the south. Here the younger sedimentary rocks form extensive lengths of high cliff coast, most notably in the form of Devonian conglomerate (locally known as pudding stone) to the south of Stonehaven.

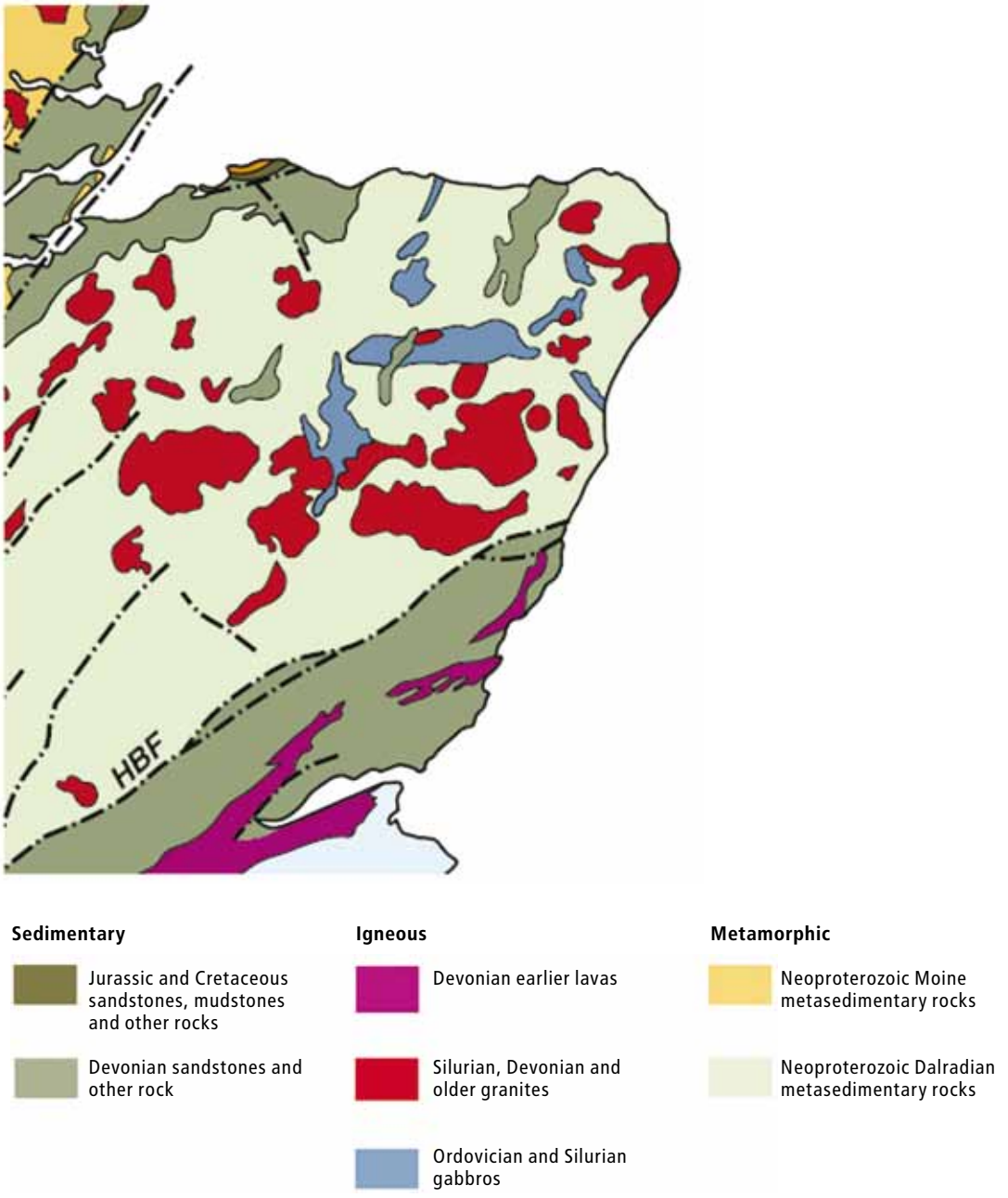


Figure 5.7 Geology of the North East (NSIUK, 2006)

The area has a low population density, leaving much of the landscape undeveloped. The majority of development is centred on the main towns of Fraserburgh, Peterhead, Aberdeen and Stonehaven as well smaller villages scattered along the length of the coast (figure 5.8).

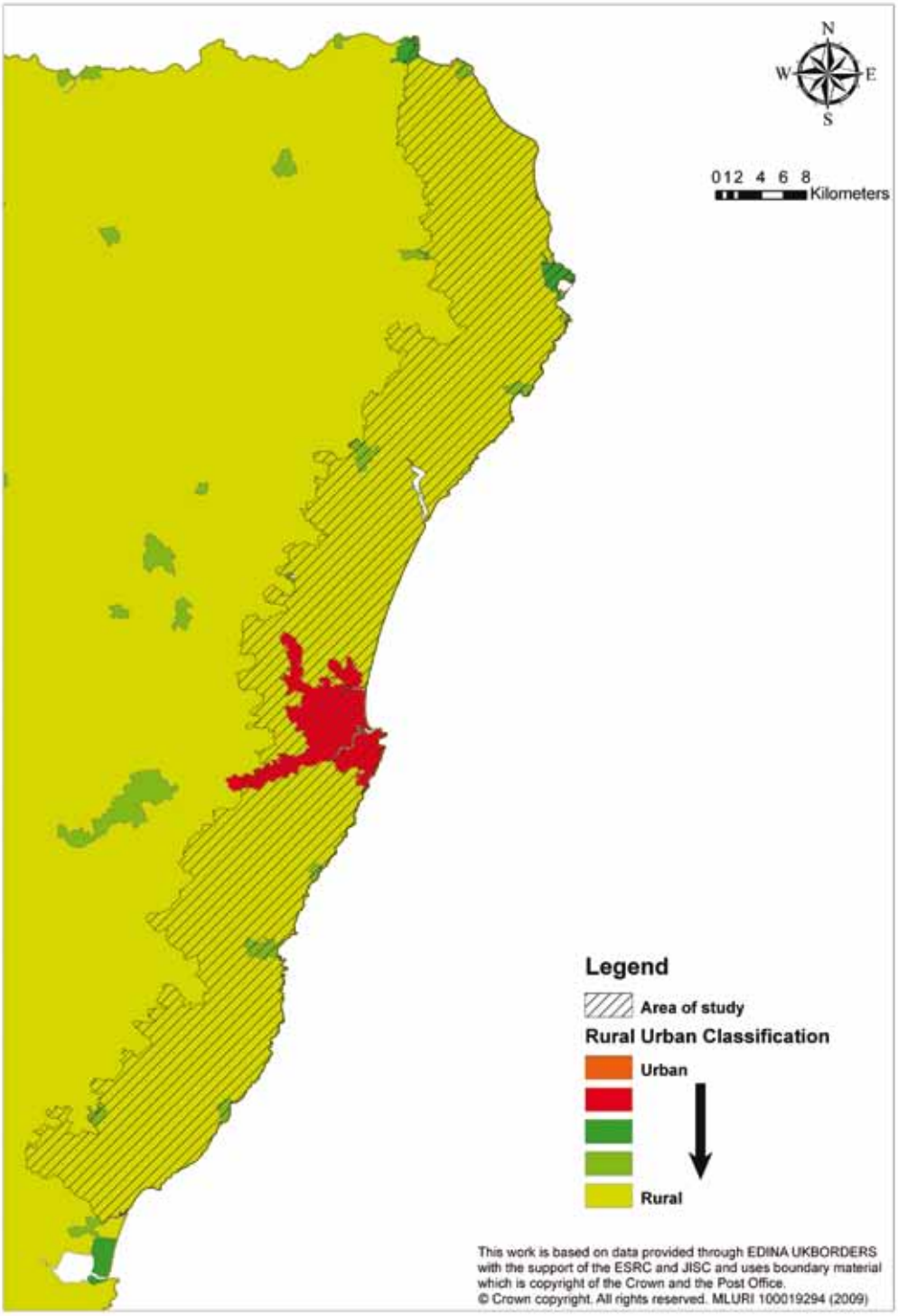


Figure 5.8 Rural and urban areas of the East Grampian coast (Scottish Office, 1996)

THE STATE OF THE EAST GRAMPIAN COAST

NPPG 13-Coastal Planning advises local authorities to classify their coast as one of three categories – developed, undeveloped or isolated. The East Grampian area is made up of developed and undeveloped coast; there are no areas of isolated coast. All settlements with a population of less than 2000 are considered undeveloped, whilst all settlements of more than 2000 people are developed. Trunk roads, port facilities and industry may affect an area's category, with St Fergus Gas Terminal classified as developed although no settlements are present. This classification provides a framework around which local authorities can then promote and control development. The Aberdeen and Aberdeenshire Structure Plan[18] (NEST) states that in general, development which requires a coastal location should be restricted to the developed coast. Proposals on the undeveloped coast should only be considered where social and economic benefits outweigh any detrimental environmental impact and where no other alternatives on the developed coast exist. However, permission has recently been given for a large scale golf course development on the undeveloped coast which is also designated as a SSSI. Development pressures continue to affect land use in some rural areas, with numerous housing developments built within commuting distance of Aberdeen on previously undeveloped land.

KEY SUMMARY POINTS:

- The East Grampian coastal zone covers an area of 1136.7km^2, much of which (1043.8 km^2) is classified as rural
- The predominant land use is arable (62%)
- Much of the coast supports near natural habitat
- The coast is separated into developed and undeveloped which helps to guide planning

SOURCES OF FURTHER INFORMATION:

- Protected areas, Scottish Natural Heritage http://www.snh.org.uk/about/ab-pa00.asp
- Protected areas, JNCC http://www.jncc.gov.uk/page-4

[18] NEST sets out a strategy for the future use of land over the next 10 to 15 years and provides a long term vision for the development of a sustainable community in the North East

5.2 Coastal Geomorphology and Biodiversity

The Aberdeenshire coastline varies from the rocky and exposed wave-eroded areas to the sedimentary habitats within estuarine systems containing saltmarsh and mudflat. Many of these habitats contain species of national or international importance. Cold temperate and arctic waters meet in the north east, benefiting a variety of species, some of which may be at the limits of their geographical range.

5.2.1 Coastal Dune Systems

Coastal dune systems (a UK BAP Priority Habitat) are found along much of the East Grampian coastline (figure 5.9), particularly between Fraserburgh and Aberdeen; St Cyrus is the only site south of Aberdeen. The total area of coastal dunes (2599ha) along the East Grampian coast represents approximately 8% of the vegetated dune resource in Scotland, and 5% of UK total.

Figure 5.9 The coastal dune system at Balmedie (Hastings, E. 2007)

Coastal dunes provide many benefits, including sea defences as they act as sediment stores, protecting the land from storms and sea level rise. Dune vegetation traps sand and prevents it from being blown inland, defending coastal settlements from sand inundation. Dunes also contain evidence of our cultural heritage, an example of which can be seen at the Sands of Forvie. Here the shifting dunes uncovered evidence of human settlements dating back 8000 years, including flints for tool making, burial sites, medieval settlements and a 12th Century Kirk. Additionally, sand dunes are imperative for biodiversity conservation due to the rare habitats found within dune ecosystems (Maes and Bonte, 2006) and their provision for many specially adapted flora and fauna. They support a wide variety of species and the north east is important for a range of these, most notably mosses, lichens, fungi and invertebrates. For example, the lichen *Cladonia mitis* and the pearl-bordered fritillary *Boloria euphrosyne* are both found at Forvie.

The dune system at Sands of Forvie is an important site for nesting eiders (*Somateria mollissima*) and terns (*Sterna sp.*) (figure 5.10) with marram grass (*Ammophila arenaria*) seeds being an important food source for wintering snow buntings (*Plectrophenax nivalis*).

Figure 5.10 Nesting terns at Forvie NNR (Drysdale, A. 2007)

The dune habitats are of considerable extent and variety, and a number of sites have been designated for their national importance. These sites have statutory protection as Sites of Special Scientific Interest (SSSI), whilst others have non-statutory designations, as Sites of Importance for Natural Science (SINS), District Wildlife Sites (DWS) or Local Nature Reserves (LNRs) as well as wider protection under the EC Habitats Directive (92/43/EEC), thus placing an obligation on member states to protect them (Figure 5.11).

Name of Site	Designation/s
Forvie	NNR, SSSI, SINS
St.Cyrus	NNR, SSSI
Foveran/Drums Links	SSSI, SINS
Loch of Strathbeg	SSSI, SINS
Garron Point	SSSI
Rattray - Kirkton Head	SINS
Pettens Links	SINS
Cruden Bay	SINS
Donmouth to Blackdog	DWS, SINS
Donmouth	LNR, DWS, SINS
Waters of Philorth	LNR
Balmedie	Country Park

Figure 5.11 East Grampian coastal dune systems and their designation level

Forvie NNR, St Cyrus NNR, Donmouth LNR and Waters of Philorth LNR have management plans, and a number including Balmedie Country Park are subject to bylaws. The dunes surrounding St Fergus Gas Terminal are managed by a Coastal Environment Committee as a result of the gas pipes which come ashore at the site. Extensive works in the dunes were carried out to enable the installation of the gas pipes underneath the dunes. The initial works included removing the sand and vegetation, laying the pipelines in specially constructed cut channels and re-instating the dune system (figure 5.12).

Figure 5.12 Pipeline laying at St Fergus Gas Terminal (Ritchie, 1997)

A coast protection study undertaken by the Halcrow Group for Aberdeen City and Aberdeenshire area showed areas of erosion (Donmouth) and acreation (north of Blackdog) and the potential impacts from any further coastal protection works on the dune system north of Donmouth. In addition, Aberdeenshire Council have carried out work at Fraserburgh to prevent trampling and quad bike erosion. The use of off road vehicles in the dune systems has been increasing in popularity and a great deal of work has been undertaken to deal with the issue and the subsequent damage.

Recreational studies on the effects of pedestrian and vehicular traffic in coastal dune systems show strong relationships between increased traffic and vegetation and soil damage (Liddle, 1975; Kutiel *et al*, 1999). Vegetation cover, height, species richness

and diversity, soil penetrable depth, organic matter and moisture content appear to react badly even to low intensity trampling by both pedestrians and vehicles. Repeated use over the same area results in track formation and a reduction of vegetation until the track becomes entirely devoid of flora and consists only of bare sand, making it vulnerable to erosion (figure 5.13).

The level and extent of the damage from quad bike use is widespread throughout the dune system, extending north to the Loch of Strathbeg and south to St Fergus Gas Terminal. Track creation and the resulting bare sand through otherwise vegetated dunes can clearly be seen in the mid ground of figure 5.14.

Figure 5.13 Track creation by off road vehicles at Rattray Head (Hastings, E. 2006)

Figure 5.14 Widespread track creation at Rattray Head (Hastings, E. 2005)

In 2005 the Quad Bike Liaison Group (QBLG) was set up in the area in response to the growing off road activity. The group is a partnership consisting of Grampian Police, EGCP, RSPB, SNH and Aberdeenshire Council Ranger Service who worked with landowners and community groups to seek a long term solution.

The resulting Operation Dune Watch campaign aimed to tackle off road vehicle use, using education, awareness raising and enforcement to publicise the message that off-road driving on the coast is damaging a unique resource; illegal; and conflicts with other coastal user groups due to noise and safety issues. The members of QBLG used their positions in their organisations to highlight the issue through talks and environmental education sessions to schools and guided walks. Grampian Police dedicated officers to enforce the legislation, using powers under the Anti-Social Behaviour (Scotland) Act 2004, including vehicle seizure to tackle persistent offenders.

A media campaign looked to influence riders' behaviour, raise awareness of its illegal status and to encourage members of the public to contact local police to report off road vehicle

activity. Press releases appeared in local newspapers, television and radio. Dune watch posters (figure 5.15) became key images linked to the campaign and were displayed in the area and at the known access points to the dunes. The signs were low cost to enable them to be easily replaced as they were frequently removed. The management approach by the QBLG has been seen as an appropriate strategy which has produced excellent results – ultimately solving the problem of off road vehicle use in the areas coastal dune systems.

Figure 5.15 Dune watch campaign posters

In addition to off road vehicle use, coastal dune systems are subject to a range of pressures including natural movement of the coastal edge, which has in places been affected by sea defences further along the coast as well as human activities such as coastal development, recreational pressures and poor management.

5.2.2 Coastal Cliffs and Heath

The coastline of East Grampian has long stretches of cliffs most notably south of Peterhead and along most of the coast south of Aberdeen. They can broadly be classified as 'hard cliffs' or 'soft cliffs'. Hard cliffs are vertical or steeply sloping and support few vascular plants other than on ledges or where a break in slope allows soil to accumulate. They tend to be formed of materials resistant to erosion including metamorphic rocks, but with granite prominent in Buchan, and conglomerates south of Stonehaven.

Soft cliffs are formed of less resistant rocks such as shales or unconsolidated materials such as boulder clay. Being unstable they form less steep slopes, are subject to frequent landslips, and are more easily colonised by vegetation. Apart from rare cases for example Nigg Bay which illustrates several different sediment depositions, the north-east's soft cliffs occur in two ways. Firstly, thick ice age deposits subject to slumping overlie hard cliffs. Secondly, some cliffs which were exposed to higher sea-levels thousands of years ago are now protected by rocky platforms or dune systems, and display 'soft' characteristics. These cliffs are most obvious at St Cyrus.

Several cliff top areas can be classified as coastal heath, of which there is 779ha[2] along the East Grampian coast. The habitat has a distinctive community type, occurring on cliff tops where saline conditions influence species composition. These types of heath communities may include plants such as *Plantago maritima* (sea plantain), *Ammophila arenaria* (marram grass) and *Carex arenaria* (sand sedge) along with heaths and crowberry. Areas of good quality heathland should consist of an ericaceous[19] layer of varying heights and structures; some areas of scattered trees and scrub; areas of bare ground; gorse; wet heaths; bogs and open water. The presence and numbers of characteristic birds, reptiles, invertebrates, vascular plants, bryophytes[20] and lichens are important indicators of habitat quality. Notable examples include the area between Cruden Bay and Longhaven (figure 5.16).

Figure 5.16 The coastal heath north of Cruden Bay (Hastings, E. 2008)

The most significant cliff habitats and heath are designated features of European candidate Special Areas of Conservation (SACs), National Nature Reserves (NNRs), or Sites of Special Scientific Interest (SSSIs). Those supporting internationally important bird populations are designated as European Special Protection Areas. Cliffs and heaths of local importance have non-statutory designations as Sites of Importance for Natural Science (SINS) District Wildlife Sites (DWS) or Local Nature Reserves (LNRs). However a significant proportion of cliff habitats and coastal heath has no protection. Such areas either lay out with designated sites, or are within a site but not designated as a site feature.

The current factors affecting this habitat include erosion, invasive species and agriculture. Natural erosion is the main influence on the physical structure of cliffs in the area. Slumping of soft cliffs is particularly noticeable, especially where it affects cliff-top paths squeezed between fields and cliff edges. Increasing use of cliff top paths can cause erosion and loss of natural vegetation.

[19] Belonging to the heath family
[20] Non vascular plants

Large areas of cliff top habitats have in the past, been lost to agriculture. Areas have been overgrazed or improved leading to habitat loss, although current changes in farming practices may provide opportunities for re-establishing heath in field margins. Cultivation close to the cliff edge could affect rates of slippage, and makes demand for cliff stabilisation more likely. Although grazing by livestock and rabbits is an obvious feature in places along the coastal cliffs and slopes, correct grazing levels have been shown to enhance species diversity. In order to maintain the area's coastal heath, grazing must be kept to a sustainable level (a lack of grazing has allowed some scrub encroachment, too much grazing reduces plant diversity) on the cliff tops and farmers encouraged to leave buffer strips on the field edge. Agricultural spray drift and run-off of pesticides, fertilisers or livestock waste from adjacent fields can also affect cliff top vegetation communities, which can lead to a loss of species diversity.

Invasive plant species can have devastating impacts on native plant communities. They are often much faster to reproduce and more tolerant of disturbance than native species, frequently outcompeting them; resulting in a monoculture[21]. Japanese knotweed (*Fallopia japonica*), an invasive species from eastern countries such as Japan and Korea, was initially introduced as an ornamental plant. However, with no natural predators in the UK it has flourished. *F. japonica* has been found at one site along the East Grampian coast, to the south of Bullars of Buchan, where it is growing on the steep cliff face.

5.2.3 Estuarine Areas

There are five estuaries along the East Grampian coast, all of which are relatively small and collectively represent a fraction (0.098%) of the total UK estuarine area of 581,300ha. The River Ythan is the largest estuary in this area at 282ha[2]. The sites are important for many species of wildfowl and waders. The Ythan has the largest number of breeding eider ducks *(Somateria mollissima)* in Britain as well as nationally important tern colonies. The sandwich tern *(Sterna sandvicensis)* colony on the reserve has held more than half the Scottish breeding population as well as smaller colonies of common *(Sterna hirundo)*, arctic *(Sterna paradisaea)* and little terns *(Sterna albifrons)*, as well as black-headed gull *(Larus ridibundus)*.

[21] Areas consisting only of a single pant species

Estuaries are at risk from eutrophication[22], most notably the Ythan Estuary which was designated as Scotland's first Nitrate Vulnerable Zone (NVZ)[23] to help control levels of nutrients entering local waterways. The catchment is intensively farmed and the resulting nutrient enrichment has led to the growth of macroalgal mats on the estuary (figure 5.17), leading to anaerobic[24] conditions beneath them and ultimately reducing the diversity and productivity of the habitat. Much of the north east of Scotland is now designated as an NVZ.

Figure 5.17 Macroalgal mats on the Ythan Estuary (Drysdale, A. 2003)

5.2.4 Coastal Saltmarsh

Coastal saltmarsh develops in the intertidal zone, in sheltered waters with a net accumulation of sediments. Saltmarsh is an uncommon feature of the area (figure 5.18) although the Ythan Estuary has a significant area where it forms an important part of the estuary ecosystem and Forvie National Nature Reserve (NNR).

The main plant species include the common saltmarsh grass *(Puccinellia maritime)*, samphire *(Salicornia spp)*, channelled wrack *(Pevetia canaliculata)* and cordgrass *(Spartina spp.)*. These in turn support a number of UK Priority Species such as wigeon *(Anas penelope)* and redshank *(Tringa tetanus)*. Saltmarshes are home to many invertebrates, such as burrowing amphipods, ragworms and the mud snail *Hydrobia ulvae*. The upper saltmarsh and strandline are important areas for the adults and larvae of moths, beetles and flies.There are 25 rare and scarce plant species recorded in the East Grampian area. Worthy of note is the Scottish scurvy grass *Cochlearia scotica* found the upper edge of the saltmarsh. Ungrazed saltmarsh support other rare invertebrates, such as the ground beetle *Aepus marinus*, unique to the harsh conditions encountered there.

[22] Eutrophication is an increase in nutrients, frequently from agricultural run off or sewage which in turn increases plant growth often to detrimental effects

[23] A designation for areas of land that drain into nitrate polluted waters, or waters which could become polluted by nitrates.

[24] Without oxygen

Saltmarsh Site	Grid Ref.	Area (ha)
Fraserburgh Bay	NK022648	2
Loch of Strathbeg	NK070602	15.91
Rattray Bay	NK106533	0.3
Lunderton	NK116497	0.24
River Ugie	NK116475	0.08
Ythan Estuary	NK007284	25.19
Balmedie	NJ982192	0.2
Don Mouth	NJ948094	0.51
St. Cyrus	NO744635	4
		Total 48.43

Figure 5.18 Extent of coastal saltmarsh in NE Scotland (Alexander *et al*, 1998)

5.2.5 Mudflats

Fully marine mudflats are rare in the north east. However, there are good examples of variable salinity mudflat in the River Ythan and within St Cyrus NNR. Mudflats have high primary productivity in terms of benthic microalgae, resulting in large numbers of invertebrates, and so providing the basis of the biodiversity in the estuary. This productivity supports predatory birds and fish, and provides important nursery areas for flatfish. Where large extents of mudflats exist, they minimise the impact of waves on the shore, reducing erosion rates.

5.2.6 Muddy Gravel

Muddy gravel habitats occur in areas protected from wave action and strong tidal streams. In the North East, this habitat is found only in the seaward reaches of the Ythan Estuary. The dominant fauna are polychaetes such as the bristle worm *Notomastus latericeus* and bivalve molluscs. This diverse habitat provides food for estuarine wildfowl and nursery areas for fish. The extensive mussel beds found in the Ythan Estuary bind the mud and gravels and support species more commonly found on rocky shores, such as bladder wrack *(Fucus vesiculosus)*, common periwinkle *(Littorina littorea)* and acorn barnacles *(Semibalanus balanoides)*. These mussel beds and their invertebrate fauna are the dominant food source for the UK's largest breeding population of eider duck *(Somateria mollissima)*. Mussel farming no longer takes place in the estuary, leading to a lack of management for the species and an ageing population. This is thought to have significant impacts on the *S. mollissima* population as the beds become silt covered and make feeding difficult. *S. mollissima* are also impacted upon in the estuary by recreational windsurfers who can break up rafts of birds; separating young from the adults and making them vulnerable to predating gulls. Signs are in place to discourage windsurfers from the estuary during the breeding season but disturbance is still occurring. It becomes difficult to enforce any exclusion zones below low water as historical access laws state that there is a public right of access and recreation.

5.2.7 Rocky Coastline

The majority of the rocky coastline of the north east is exposed and varies from vertical cliffs to shore platforms, boulder shores and rocky reefs. The main rock type between Kincardine and Stonehaven is Old Red Sandstone or volcanic rock and other igneous rocks interbedded with, or intruded into, sediments. There are also areas of conglomerate. The Old Red Sandstone produces cliffs with caves and stacks. The igneous and volcanic rock is harder and forms headlands with geos. To the north of Stonehaven lie mainly granites, gneisses and schists. The majority of the rocky intertidal area is fully marine, however there is a variable salinity rock shore community in the Dee estuary mouth on the south shore. The habitat can be extremely rich in invertebrate life including hydroids and anemones, encrusting sponges and ascidians. Molluscs such as dog whelks, winkles and limpets, crustaceans including barnacles, amphipods and shore crabs and calcareous-tube forming worms are also present. In the wave exposed coasts, the intertidal shore communities are dominated by barnacles, limpets, mussels and encrusting flora and fauna, often with a fringe of brown and red algae at the low water line and below. The barnacle *Chthamalus montagui* found at Fraserburgh and Stonehaven is rare in the area and at its northern extent. In less exposed areas, algae can better establish themselves and may dominate the intertidal rocks. The diversity of invertebrate fauna also increases. There is a distinct zonation[28] of species in the intertidal zone from the lichen *Verrucaria maura* in the littoral fringe to kelp *(Laminaria sp.)* in the sublittoral fringe. Between these two extremes there is a mosaic of species with the community structure dependent mainly on the degree of exposure. Algae on hard sub-strata provide shelter and micro-habitats for other species and therefore increase the productivity and biodiversity of the shore.

Name of Site	Designation/s and size
Cairnbulg to St Combs Coast	SSSI (52.86)
Loch of Strathbeg	Ramsar (615.94), SSSI (982.8), SPA (485), SINS
Bullars of Buchan Coast	SSSI (109)
Buchan Ness to Collieston	SAC (208.62), SPA (207.52)
Sands of Forvie, Meikle Loch and Ythan Estuary	SAC (734.05), NNR (973), SSSI (976.3), SINS, SPA (1003.35), Ramsar (314.17)
Foveran Links	SSSI (203.2)
Dee Estuary	SAC (2446.82), DWS, SINS
Nigg Bay	SSSI (4.7), SINS, DWS
Cove	SSSI (15.3), SINS, DWS
Findon Moor	SSSI (26.2)
Garron Point	SSSI (70.48), SAC (15.58)
Crawton Bay	SSSI (9.2)
St. Cyrus and Kinnaber Links	NNR (92), SSSI (311.8)
Rattray - Kirkton Head	SINS
Cruden Bay	SINS
Donmouth to Blackdog	DWS, SINS
Donmouth	LNR (36), SINS, DWS
Waters of Philorth	LNR (16.9)
Balmedie	Country Park (75)

Figure 5.19 Coastal habitat designations along the East Grampian coast
***all areas are given in hectares**

[28] The horizontal bands of species seen on the foreshore, predominately as a result of emersion and species tolerance to this.

Species diversity is highest on shores with a wide variety of sub-habitats (pools and overhangs etc). Approximately 80 to 100 species of macroalgae have been recorded at individual sites across the northeast, with 106 at Buchan Ness. The total macroalgal species list for the U.K. is approximately 630. The very rare dickies bladder fern *(Cystopteris dickieana)* is found in a few caves on the south Aberdeenshire coast. Much of the intertidal habitat within the area is protected (figure 5.19) by international, national and local designations.

KEY SUMMARY POINTS:

- The north east coastline is made up of dune systems; cliffs and heath; small estuarine areas; and the associated intertidal habitats
- These habitats are subject to a number of pressures including recreation; development; agriculture and eutrophication; and invasive species
- Much of the coast including the intertidal areas is designated for its nature conservation value
- The Ythan Estuary was designated as Scotland's first NVZ due to its nitrogen input

SOURCES OF FURTHER INFORMATION:

- Marine and Coastal HAPS, NELBAP www.nesbiodiversity.org.uk/
- Quad Bike Liaison Group Final Report http://www.aberdeenshire.gov.uk/rangerservice/QBLG_Final_Report.pdf
- Forvie NNR Reserve Management Proposals 2005-2011 http://www.snh.org.uk/nnr-scotland/downloads/publications/ForvieNNRProposal2005to2011.pdf

ACTIONS: (action partners)

- Work with NELBAP and the relevant working groups to ensure the coastal and marine HAPS are progressing and actions being met (EGCP, NELBAP, working groups)
- Continue to monitor levels of quad bike use and restart QBLG as required (QBLG)
- Work with SNH, NELBAP, HAP working groups and land owners to sustain coastal heath and remove invasive species particularly *Fallopia japonica* (EGCP, SNH, NELBAP)
- Work with Forvie Reserve Manager to reduce the impact of windsurfers on breeding birds (EGCP, SNH)

5.3 Marine Environment

Below Mean Low Water Springs[29] are a number of habitats including open seawater; mud habitats in deep water; sublittoral[30] sand and gravels; inshore sublittoral rock (figure 5.20) and a number of wrecks acting as artificial reefs and becoming biodiversity hotspots. Current knowledge of the distribution and status of these habitats and the species they support is limited; the Marine Nature Conservation Review surveys covered little of the area. Voluntary schemes such as the Marine Conservation Society's Seasearch have been

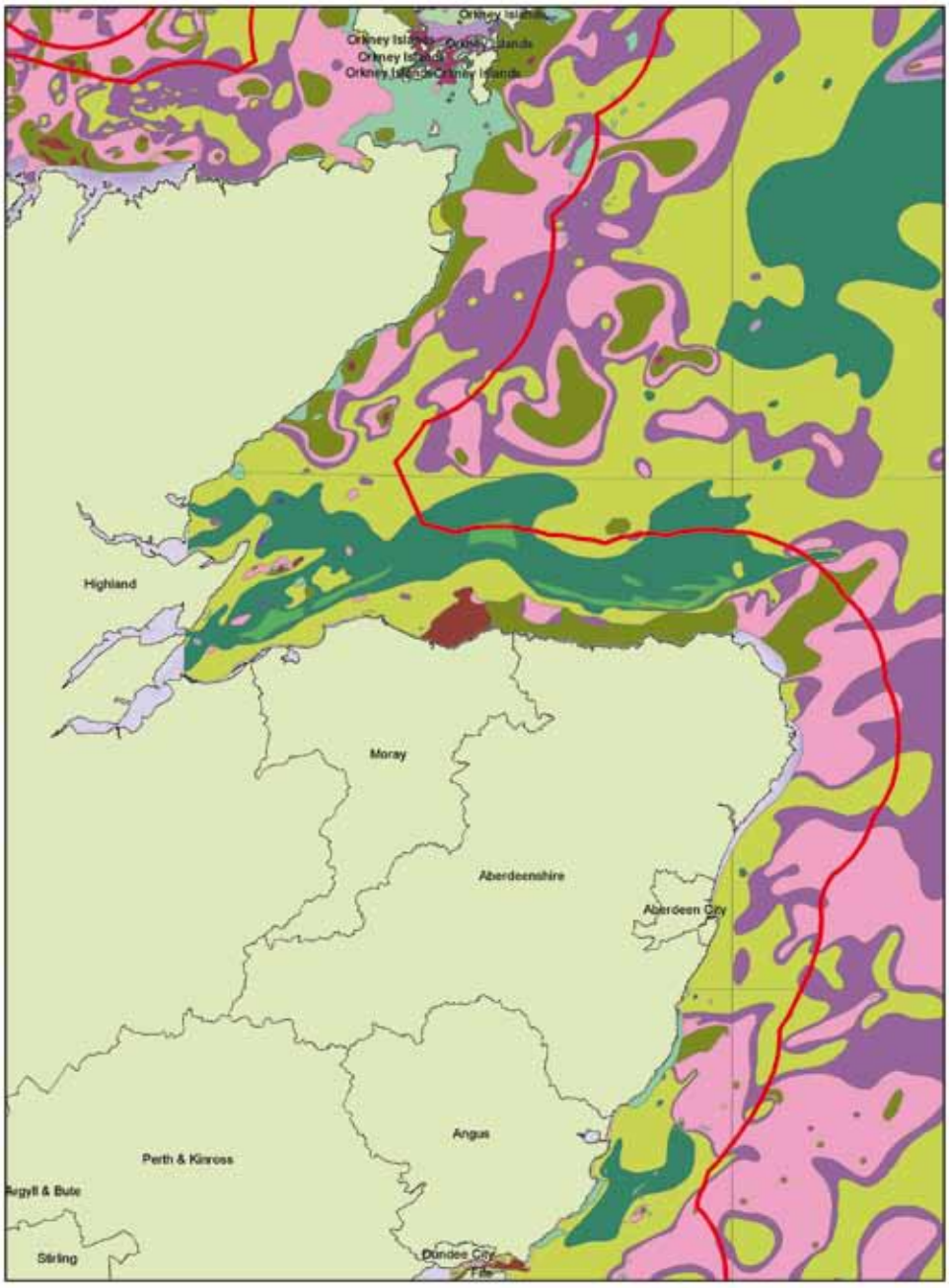


Figure 5.20 Distribution of Sediments in the North East (c) British Crown and SeaZone Solutions Limited. All rights reserved. Products Licence No: 122006.004

[29] The lowest level to which spring tides retreat

[30] The area lying between the low tide line and the edge of the continental shelf to a depth of approximately 200 meters

surveying the coastline with the participation of recreational divers. Since the project began, divers have collected 3500 species records, although significant gaps do remain. A Marine Habitat Action Plan for the north east has recently been written and contains information on the status and ecology of these habitats as well as species distribution and threats. In addition, the plan outlines the principle factors currently affecting the quality and extent of the habitats identified as well as a number of actions to help conserve and enhance the marine habitats, and the species reliant upon them.

5.3.1 Factors affecting the Habitats

Anthropogenic developments range from small alterations to large scale developments such as offshore wind farms. Each development, and their cumulative effects, will have an impact on the surrounding marine environment. Impacts should be kept to a minimum with appropriate management, including site selection and mitigation measures. Habitat loss in this context could include the area occupied by the new development as well as the area surrounding it which has been disturbed and modified. In high energy habitats such as exposed coasts the species present are tolerant to a certain amount of disturbance; they tend to be fast growing and have a high reproductive rate as well as strategies to help protect against or evade disturbance and can therefore repopulate an area more quickly. Habitats which are more stable, such as deep mud habitats, are populated by slow growing, long lived sessile[31] organisms and thus are more sensitive to disturbance; recovery to the original mature community in such habitats will be slow.

Marine pollution includes substances introduced by humans into the maritime environment which may be a hazard to human health, hinder marine activities or harm living resources and marine ecosystems. Marine pollution can be categorised into degradable wastes, fertilizers, dissipating wastes such as heat from the cooling waters of coastal power stations, conservative wastes and solid wastes including litter. The source of these inputs can be direct inputs, riverine, shipping, offshore, and atmospheric. These inputs result in changes to the environment which may vary in both spatial and temporal scales and are often detrimental to marine habitats and species with a variety of impacts. Marine litter can be categorised by type, for example plastic, sanitary and polystyrene or via source (direct littering via beach users, fishing, sewage and shipping). Litter affects marine and coastal habitats (and thus the species dependent on them) in a number of ways. The species are vulnerable to entanglement and ingestion of litter, which may bio-accumulate. The effect of litter on marine habitats is less well documented. It is thought to include abrasion of the substrate, principally mud habitats in deep water and sublittoral sands and gravels. Other effects which determine the habitats ability to support species include reduced oxygen (through increased BOD and COD[32]), reduced light, prevention of marine snow[33] reaching the sea floor and the smothering of habitat.

Disturbance affects the species present in two ways; direct disturbance, for example from recreational boat use, or indirect disturbance by the modification of the community present via selective removal of key species and the physical modification of the habitat. Community modification can be clearly seen in the concerns over the cod stocks, where selective removal of a top predator has changed the structure of the North Sea fish community. Physical modifications caused either by dredging, trawling or removal of substratum, will either remove all the species present leaving an altered substrate that

[31] Permanently attached or fixed; not free-moving

[32] Biological Oxygen Demand and Chemical Oxygen Demand are measures of the amount of dissolved oxygen in the water required to degrade the wastes

[33] A continuous shower of mostly organic detritus falling from the upper layers of the water column

will be initially re-colonised by opportunistic species or change the substrate to an extent that the original community is no longer viable.

Climate change may have a major influence on the ecology and distribution of marine species. Temperature is a vital factor; controlling physiological processes at all levels from the individual to the ecosystem level (FSBI, 2007). Sea temperatures are predicted to rise by between 1 and 2.5˚C in the next 50 years (Clark et al, 2003). A rise in temperature may result in increased global production of fisheries (FSBI, 2007) but the response of individual species is dependent on their ability to adapt to the changes and to the shifting communities on which they depend. Some species may exhibit a shift in distribution or species boundary, as has been reported in many fishes in the North Sea, such as the angler fish *(Lophius piscatorius)*, whiting *(Merlangius merlangus)*, bib *(Trisopterus luscus)* and Atlantic cod *(Gadus morhua)*. Some may be less able to cope physiologically with higher temperatures and experience local declines. Warmer sea temperatures may result in a change in the timing and abundance of plankton and consequently in a lack of food availability for larval fish and result in lower recruitment, as has been reported in Atlantic cod *(G. morhua)*. Heightened carbon dioxide concentrations may reduce ocean pH and evidence suggests that this can reduce the ability of corals and plankton species to maintain their external calcium carbonate skeletons. Rising temperatures may also increase the establishment of invasive species and pathogens, especially pertinent to aquaculturalists and fishery managers. Long-term monitoring programmes will play a key role in revealing and controlling changing species distributions, while laboratory studies may be able to estimate thermal optima and tolerances (FSBI, 2007).

Introduced species are those transported to an area outside its native range. Introduced species have existed for millennia however with the increase in international trade concern has risen over the past few decades. There is increasing concern over warm-water species which cannot currently survive or reproduce in Scottish waters which may be able to do so in the future, as sea temperatures increase (such as the Pacific oyster (*Crassostrea gigas*). Species are most commonly introduced either accidentally or intentionally as part of mariculture, fouling on ships, and via ballast. The UK has signed up to agreements to improve ballast water exchange practices to reduce numbers of new alien species arriving. Best practice guidelines also exist for movement of shellfish for mariculture purposes, to reduce the likelihood of non-native introductions by this means. Some species also termed invasive, can have a detrimental effect on the environment to which they are introduced, through competition for resources such as food or light or more directly through predation. No invasive species have been identified as important in NE Scotland. However species such as wire weed (*Sargassum muticum*) have been spreading around the west coast of the British Isles and have been found to have a serious effect on local biodiversity. Removal or control of non-native species in the marine environment is difficult, if not impossible, once they are established. Therefore control measures must focus on preventing the introduction of potentially invasive species.

[29] The lowest level to which spring tides retreat

[30] The area lying between the low tide line and the edge of the continental shelf to a depth of approximately 200 meters

KEY SUMMARY POINTS:

- Marine habitats off of the East Grampian coast include open seawater; mud habitats in deep water; sublittoral sand and gravels; inshore sublittoral rock and a number of wrecks which can act as artificial reefs and become biodiversity hotspots
- Large numbers of species are dependant upon these habitats but information on both the extent and status of the habitats and species is limited
- The marine environment in this area is subject to a number pressures including climate change; marine litter; introduced species; disturbance and habitat modification; and habitat loss through anthropogenic developments

SOURCES OF FURTHER INFORMATION:

- Marine Habitat Action Plan for the North East
  http://www.nesbiodiversity.org.uk/
- Coastal Sand Dunes and Shingle HAP
  http://www.nesbiodiversity.org.uk/habactionplan.htm#Coastal
- Estuarine and Intertidal HAP
  http://www.nesbiodiversity.org.uk/habactionplan.htm#Coastal

ACTIONS: (action partners)

- Ensure work is carried out to meet the actions and targets from the Marine and Coastal Habitat Action Plans (EGCP)
- Ensure the plans are monitored and updated where necessary (NELBAP)

5.4 Biodiversity Monitoring

The area supports a varied biodiversity, with a number of protected and rare species present. Of the 131 designated sites and site features, condition reporting has shown that 50 are listed as either unfavourable no change or unfavourable declining. The coastal and marine area covered by this report also supports 81 Red List species. Generally, there is insufficient monitoring of indicators to know whether UK biodiversity targets are being met in North East Scotland however individual species are in some cases well monitored and have been used as examples.

5.4.1 Seabirds

An annual survey of cliff nesting seabirds has been undertaken at Forvie National Nature Reserve since 1997. The purpose of the survey is to provide a long-term data set which may be used for a variety of purposes; for example, to study population fluctuations and distribution of species. The seabird figures for Forvie NNR show a general decline since 1998 (figure 5.21), however the data set is for a short time span and as such it is difficult to draw any firm conclusions for the status of the cliff nesting birds at Forvie. As the habitats and land use of Forvie is not typical of the area, the data can not be used as an indicator for the whole of the East Grampian coastal zone.

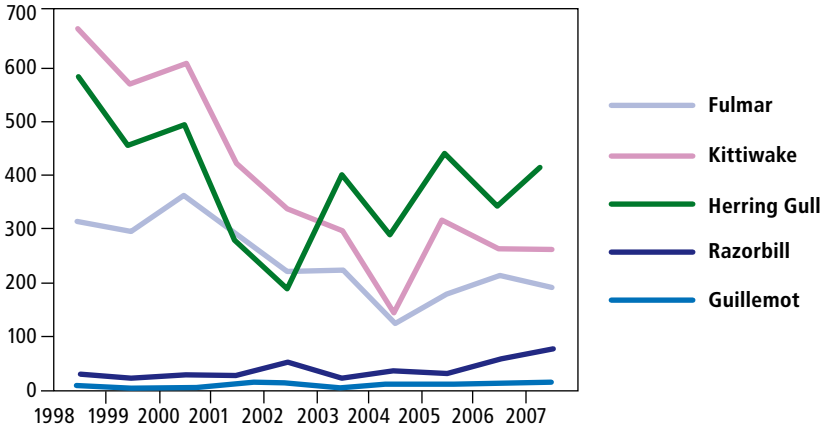


Figure 5.21 Cliff nesting seabirds at Forvie NNR 1998-2008 (Drysdale, 2007)

5.4.2 Eider Ducks

Counts of eider ducks *(Somateria mollissima)* are undertaken on the Ythan estuary within Forvie NNR. In the period 2003/04 to 2006/07, counts have shown wintering numbers have decreased by 50%, from 1,293 in 2003/04 to 632 in 2006/07 (figure 5.22). This decrease encouraged a review of numbers since 1991/92, when the counts began. This review showed that low winter numbers had occurred twice before, in 1996/97 (with a lower whole-winter mean than in 2006/07) and in 2001/02 (figure 5.22). From this the surveyors have deemed that there is no cause for concern, unless the decline in numbers continues in the coming years.

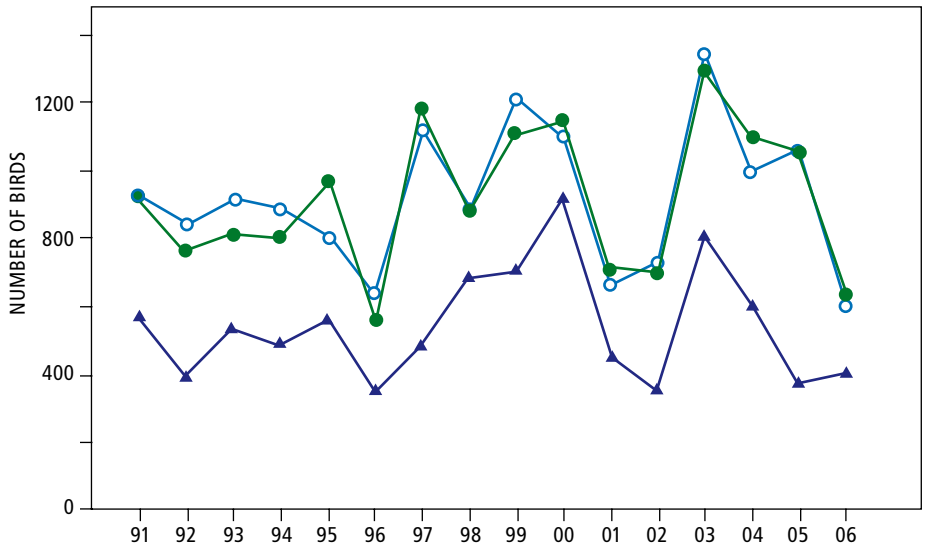


Figure 5.22 The mean number of eiders on the Ythan estuary from November to March (closed circles) and from December to February (open circles), 1991/92 to 2006/07. The triangles show the minimum number counted between November and March (Patterson, 2007)

There have been concerns over the disturbance of the eider ducklings in the reserve. The estuary is a popular site for windsurfers which can disturb and break up rafts of birds, with the adult birds taking off, leaving the young vulnerable to predation by gulls as they are unable to fly until approximately 60 days old.

5.5 Maritime Historic Environment

The East Grampian coastal zone contains 5207 known archaeological sites onshore, with a further 1490 known shipwrecks offshore. The number of known sites is increasing each year, however the growing threat posed to this ultimately finite resource, whether it be climate change or development, cannot be underestimated. Full details for all of these sites are available in the Sites & Monuments Records maintained by Aberdeenshire Council and Aberdeen City Council.

5.5.1 Prehistory (8000 BC – 500 AD)

The earliest evidence of human use of the area survives as scatters of flint flakes representing tools and waste from making those tools. These would have been produced by small bands of hunters who followed the retreating ice northwards from the last ice-age, more than 8,000 years ago in the Mesolithic period. Areas of flint working are found in dune systems such as at Menie Links and Forvie Sands.

This was a relatively stable way of life, which lasted for more than 2,000 years, until contact was made with small groups of incoming farmers who were gradually removing the forest for agriculture. These first farmers in the Neolithic period were also responsible for introducing pottery and the quarries into the deposits of flint near the coast at Boddam.

By the end of the third millennium BC the area underwent a radical social change as Beaker pottery was introduced, linked to the knowledge of metal-working coming from the Netherlands. Settlements were establised across the region in the Bronze Age.

From the mid to the end of the second millennium BC, the physical environment declined, caused by the gradual and irregular changes in the climate, coupled with poor agricultural practices, soil erosion and impoverishment. With this long term deterioration in the climate (from c1200 BC), the archaeological record also changes, with more evidence of settlement in the form of round houses, agricultural plots and clearance cairns as typified by the structures found in the dunes at Sands of Forvie. From about 500 BC, iron technology was adopted but bronze continued in use for prestige goods.

5.5.2 Early Historic – Post Medieval (500 AD – 1900 AD)

The Picts dominated Scotland north of the Forth of Clyde from the fourth to the ninth centuries AD. Their tribal society developed fairly seamlessly from the preceding millennium. Organised by potentates, kings, sub-kings and chiefs it was essentially based on warfare and violence. Christianity came late, appearing in the seventh century near Aberdour on the coast.

By the ninth century the region was being attacked or pressured to the north, west and south by Viking and other raiders. Several of the promontory forts, for example Dunnottar, were attacked but no permanent Viking settlement was established, owing perhaps to the density of Pictish settlement and the ease, in the open terrain, of deploying reinforcements to any landing site.

By the late tenth century or early eleventh century, the tribal Pictish kingdoms of the North East had been transformed under Scottish kings from Dalriada in Argyll, who had been ruling the adjacent kingdoms of the Picts and Scots, into areas administered by governors. A fully medieval society developed during this time under the Canmore dynasty which in the next two centuries took on Anglo Norman practices. The building of castles, such as at Old Slains, Boddam and Dunnotar, give us some of the most iconic and recognisable features of the coastline.

It also gave rise to several villages that have since disappeared, such as Cowie to the north of Stonehaven, at Sands of Forvie and at Rattray Head. The loss of the natural sea harbour at Rattray due to the shifting sands is a clear indication of how the coast has changed over the years, and the impact that has had on those who live along it.

5.5.3 World War II (1939 AD – 1945 AD)

There were high expectations during WWII that Germany would attempt to invade Britain. Makeshift defences were installed in the northeast along the entire coastline, including anti-tank blocks, pillboxes, and gun emplacements. In addition remains such as the radar station at Cruden add further detail to this massive undertaking.

A large number of these defences survive from that period, including less prominent features such as stretches of barbed wire and anti-glider traps. At Newburgh across the sand dunes are the remains of a 1 km long tank wall that consists of a mound, ditch and a steel pole scaffolding wall.

Further south lies the Cowie Line, a Scheduled Ancient Monument, which is a set of features recognized as being of national importance that belonged to a defensive line

that runs along the River Cowie from Stonehaven inland. The line protected a natural bottleneck along the coast and consists of artificially steepened hill slope bases, revetted embankments along the river, pillboxes and tank traps.

5.5.4 Maritime (700 AD – 1945 AD)

According to the *'Annals of Tigernach'* in 729 AD around 150 Pictish vessels were wrecked off Troup Head on the Moray Firth. If we consider this one reference alone it suggests that the high level of maritime activity we currently see in this area has been ongoing for at least several hundred years.

Of the 1490 currently known shipwrecks that lie offshore, the remains vary from the Scheduled Ancient Monument the Santa Catarina, a reputed Spanish galleon that gives its name to St Catherine's Dub near Collieston, to U-40, a WWI U-boat sunk by a British submarine while it was attacking a trawler off Aberdeen Harbour. Given the importance of the ports along this coast and the frequent winter storms it is inevitable that there are many more wrecks still waiting to be discovered. In addition to their historical value these wrecks also provide natural habitats for many species.

Beyond the shipwrecks the maritime environment is also made up of submerged landscapes that may contain further archaeological sites, particularly from the Mesolithic Period (circa 8000 BC – 4000 BC). Further work is required to understand the historic environment potential offshore, and the effects that climate change and development may have on it.

5.5.5 Threats to the Historic Environment

There are currently three principal threats to the historic environment:

1.Development – this can be carefully monitored with appropriate mitigation measures put into place.

2.Erosion – the table below (figure 5.23) indicates some of the key archaeological sites that are currently suffering from erosion problems. Further work is required to understand and record other sites that may be affected, particularly around shifting dune systems where old land surfaces are frequently exposed.

3.Fishing – the impact and damage of dragnets and other devices when they are caught on shipwrecks has been highlighted in other parts of the UK coastal waters. Further work is required to understand the nature and scale of the threat along this section of the coast.

SMR Reference No	National Grid Reference	Name and Site Type
NO76NE0007	NO7630 6492	Kaim of Mathers, remains of castle
NO76NE0023	NO7689 6476	Tangleha', Milton Ness, burial exposed by erosion
NO76NE0003	NO7841 6627	Cove Mill cist exposed
NO87SW0025	NO8584 7483	Castle of Cadden, erosion problems
NO87NE0005	NO8612 7529	Whistleberry Castle erosion problems
NO87NE0004	NO8637 7573	Adam's castle
NO88SE0001	NO8821 8463	Dunnicaer, probable promontory fort
NO88NE0074	NO8807 8518	Downie Point, possible fort/ dun
NO88NE0019	NO8837 8714	Castle of Cowie
NO88NE0053	NO8967 8970	Blackhills mound
NO89SE0026	NO8990 9066	Castle rock
NO99SW0006	NO9029 9161	Cropmark of enclosure
NO99NW0025	NO9362 9661	Broad Haven promontory fort
NJ91SE0003	Balgownie Links	Pill boxes/ anti-tank blocks coastal defence
NJ92SE0005	NJ9928 2121	Menie Links/ flint working site
NK02SW0005	NK0044 2366	Foveran Sands - glider trap
NK02SW0003	NK0081 2439	Forvie Sands flints
NK02SW0004	NK0080 2445	Forvie pill-box
NK02NW0018	NK0119 2524	Forvie flint scatters
NK02NW0045	NK0102 2527	Forvie flint scatters
NK02NW0032	NK0100 2515	Forvie flint working
NK02NW0004	NK0113 2564	Forvie settlement / flint working
NK14NW0084	NK1184 5006	Craigewan beach/ pill-boxes/ coastal defence
Various	East Coast	All WWII coastal defence sites within the dune systems

Figure 5.23 Coastal archaeological sites threatened by erosion in Aberdeenshire

KEY SUMMARY POINTS

- The East Coast has known archaeological activity dating from WWII back to the Mesolithic period (8000 B.C.).
- Increasing pressures upon this finite resource require more detailed work to be undertaken to understand what of the historic environment survives.
- 5207 known onshore archaeological sites within coastal area
- 1490 known shipwrecks offshore out to 12 mile limit

SOURCES OF FURTHER INFORMATION

- Aberdeenshire Council Archaeology Service
  www.aberdeenshire.gov.uk/archaeology
- Aberdeen City Archaeology Service
  http://www.aberdeencity.gov.uk/localhistory/nc_loc/loc_archaeological_unit.asp
- Aberdeen Maritime Museum
  http://www.aagm.co.uk/code/emuseum.asp?page=buildings_maritime_museum
- Royal Commission Archaeological and Historic Monuments Scotland
  http://www.rcahms.gov.uk/
- Historic Scotland
  http://www.historic-scotland.gov.uk/

5.6 Coastal Access

The Land Reform (Scotland) Act 2003 provides a statutory right of responsible access to be on or cross most land and inland water, including the foreshore for the purposes of non motorised recreation and to carry out relevant educational activities. The Act does not affect existing rights of navigation, fishing or recreation on the foreshore. An individual can now cross most land to access the coast; that land does not need to be a lawful access point in terms of public rights of way or a public road. Bylaw exemption orders can be implemented that allow certain land and activities to be excluded from access rights where it is justified. The Scottish Outdoor Access Code interprets the Land Reform (Scotland) Act 2003 and provides guidance what constitutes responsible behaviour by the public and land owners/managers.

The provision for access along the coast is heightened by the Land Reform (Scotland) Act 2003, as the legislation clarified the situation. However, the presence of an actual coastal path is limited both in its length and condition. In places the path limits users, as much of it is narrow and uneven. It is not currently possible to walk the length of the East Grampian coast on coastal paths.

Core paths are a network of paths which cater for all abilities and types of users (e.g. walkers, cyclists, horse-riders, canoeists) but not every core path has to be useable by all. The network of core paths will be identified and agreed through the preparation of a Core Paths Plan, which is required under the Land Reform (Scotland) Act 2003. The candidate core paths for the East Grampian coast utilise the existing coastal path network; no new or replacement paths to link up the coastal path into one continuous route are planned.

The Nave Nortrail project aimed to create a network of footpaths around the North Sea coast to enable people to enjoy the coastal landscape. The EU funded project aimed to create new paths along with regenerating current ones. Locally, no new routes were created although some existing ones benefited from improved signage to link the footpath network. The project did not include funding for maintenance and the network is requiring upgrading. Complaints have been received regarding eroding paths but no funding is in place to carry out such work. The nortrail project has come to an end and the path is now the Aberdeen and Aberdeenshire Coastal Path (part of the North Sea Trail).

KEY SUMMARY POINTS:

- Historic coastal rights include a public right of fishing, navigation and recreation
- The Access Code has affirmed this; a statutory right to cross most land and inland water now exists, though some exemptions are in place
- Coastal access is heightened by the core paths plan and nave nortrail which aim to provide a network of public paths

SOURCES OF FURTHER INFORMATION:

- Countryside Law in Scotland, Rowan-Robinson and McKenzie Skene, 2000
- The Access Code
  http://www.outdooraccess-scotland.com
- Nave Nortrail
  http://www.northseatrail.co.uk/
- Aberdeenshire Core Paths Draft Plan, Aberdeenshire Council
  http://www.aberdeenshire.gov.uk/outdooraccess/core_paths_plan/index.asp
- Aberdeen City Core Paths Draft Plan, Aberdeen City Council
  http://www.aberdeencity.gov.uk

ACTIONS:

- Undertake a survey of the coastal path to determine access points, condition and works required
- Investigate potential funding opportunities to continue and enhance the work of Nortrail
- Promote the use of the coastal paths via the EGCP website, newsletters and other literature produced
- Make links to public transport including the dial a bus service during promotion
- Identify current gaps in the coastal path, with the aim of having a completed East Grampian coastal path
- Identify launch points for recreational users of non motorised and motorised transport
- Develop cycle access to the coast and work with local authorities and the local cycle forums
- Work with Aberdeen City Council to remove the 'No Cycling' signs from the coastal path south of Aberdeen in line with current access legislation

5.7 Seaside Awards

EGCP have been working in association with Aberdeen City Council, Aberdeenshire Council and local communities to attain Seaside Awards for local beaches. These awards are presented by Keep Scotland Beautiful where bathing water is of good quality and is managed in line with the EU Bathing Water Directive (2006/7/EC). To allow for the different character of Scotland's beaches, they are separated into two categories; resort beaches exist where facilities such as toilets, shops and cafes are present and rural beaches tend to be quieter with fewer facilities. To attain the award, beaches must achieve a number of criteria (30 for resort beaches and 15 for rural beaches), including meeting the mandatory standard of the revised Bathing Water Directive (although an award beach does not have to be a designated Bathing Water under the directive): no pollution; excellent litter management; information provision; community involvement; safety measures in place and active management. The season currently runs from 1st June to 15th September.

The East Grampian coast now has seven beaches with the award including Aberdeen Beach (resort), Stonehaven (rural), Balmedie (rural), Collieston (rural), Fraserburgh Esplanade (resort), Fraserburgh Waters of Philorth (rural) and Peterhead Lido (resort). In the previous season (2007) the same area had four awards. Until 2005 the area held no awards since the early 1990s. Research has shown that an award itself is not sufficient

to increase visitor numbers as there is a high degree of confusion amongst the general public as to what the various awards mean (Nelson *et al*, 2000). However, the achievement of an award shows a certain standard has been maintained and may prove a successful method of managing local beaches. This in itself has many benefits for the marine and coastal environment and may in turn attract a greater number of visitors.

To date, no beach or marina in this area has the international Blue Flag award. In 2008, six beaches and one marina in Scotland held the award (five of which are in Fife). Two beaches were previously withdrawn due to breaches in the stringent water quality criteria. There are 27 rigorous Blue Flag criteria relating to environmental education and information; water quality; environmental management; and safety and services.

5.8 Designated Bathing Waters

The East Grampian coast currently has seven bathing waters including Fraserburgh (Tiger Hill), Fraserburgh (Waters of Philorth), Peterhead Lido, Cruden Bay, Balmedie, Aberdeen and Stonehaven which are designated under the revised Bathing Waters Directive (2006/7/EC) and are required to meet European standards for water quality during the bathing season (1st June–Mid September). The main objective of this legislation is to protect public health and the environment from faecal pollution. There are 80 designated bathing waters in Scotland, 77 of which are coastal waters; the remaining freshwater sites are Luss on Loch Lomond, Loch Morlich and Dores on Loch Ness. The results of the local bathing waters are shown in figure 5.24. From this it is apparent that there has been a general increase in water quality in the area, although there have been exceptions to this, with some years showing a decrease. Since the introduction of this legislation, water quality at the designated sites has improved overall, with significant investment from water companies to improve sewage screening and treatment near bathing waters. It has been estimated that the investment by UK water bodies is close to £600 million (Hewett, 2007).

	FraserBurgh Tiger Hill	Fraserburgh (Philorth)	Peterhead Lido	Cruden Bay	Balmedie	Aberdeen	Stonehaven
1996	Good	Good	Good	Good	Good	Excellent	Excellent
1997	Good	Excellent	Good	Poor	Good	Good	n/s
1998	Poor	Good	Good	Poor	Good	Good	Poor
1999	Good	Excellent	Excellent	Good	Excellent	Excellent	Poor
2000	Good	Excellent	Excellent	Poor	Good	Good	Good
2001	Poor	Excellent	Good	Good	Good	Good	Good
2002	Good	Excellent	Poor	Poor	Good	Good	Good
2003	Excellent	Excellent	Excellent	Good	Excellent	Good	Good
2004	Good	Excellent	Good	Good	Excellent	Good	Good
2005	Excellent	Excellent	Excellent	Good	Excellent	Good	Poor
2006	Excellent	Good	Excellent	Good	Excellent	Excellent	Good
2007	Good	Excellent	Excellent	Good	Excellent	Good	Good
2008	Excellent	Good	Good	Poor	Good	Poor	Good
Overall	Good	Excellent	Excellent	Good	Excellent	Good	Good

* ICZM Indicator

Figure 5.24 The bathing waters on the East Grampian coast and their water quality results (1996-2007) *

The bathing waters are designated as poor, excellent or good depending on the levels of coliform and faecal coliforms[35] and more recently *Escherichia coli* and *Intestinal Enterococci*. The frequency of sampling is at least once per fortnight during the bathing season for total and faecal coliforms. For the remaining parameters, checks are made when inspections show that the substances may be present or where the quality of the bathing water has deteriorated.

The revision of the Bathing Waters Directive (transposed through the Bathing Waters (Scotland) Regulations 2008) has brought some changes which all bathing waters must adhere to by 2015. From 2008 the bathing waters will have to be identified annually at the start of the season instead of the current situation where they are considered bathing waters until further notice. This may result in more beaches not being re-designated as a result of failing to meet the criteria the previous season for example for low usage or poor water quality. The length of the bathing season will also be defined annually at the start of each season from 2008. The season is defined by the directive as the period during which large numbers of bathers can be expected. It is not thought that this or the subsequent length of the season will change in the short term. The revision increases the water quality standards which need to be met. Four new classifications are introduced – excellent, good, sufficient, and poor, based on concentrations of bacteria *(Intestinal enterococci and Escherichia coli)* found in the water. The good standard is broadly equivalent to the existing guideline standard. All bathing waters must be of at least sufficient standard, and that appropriate measures are taken to increase the numbers of bathing waters classified as excellent or good by 2015. Classification is based on four years' worth of data, which means that results from 2012 onwards will be used in the 2015 classification. Using the water quality data from recent years against these criteria suggests that up to one-third of designated bathing waters in Scotland may be classified as poor. This is not only dependent on the water quality, but also on whether or not suitable management actions are taken where bathing waters are failing the criteria. Other changes to the directive include the requirement to identify risks to compliance; alterations to the sampling times and methods; and whilst the criteria relating to the classification of bathing waters are currently bacteriological, the revision states other parameters must also be considered in a bathing water's management. Amongst these considerations is the presence of litter pollution.

Similar to the seaside awards, designated bathing waters in them selves may not attract more visitors. It does however, ensure higher water quality standards as bathing waters with poor standards are targeted to determine the reasoning for the high levels of total coliforms and action taken rectify these. This in turn may attract a greater number of users to a particular beach and help to boost the local economy.

Aside from the low user numbers (bathing waters in Scotland must have a peak of 150 visitors or more per day to be eligible), the beaches in this area are failing to meet the criteria for seaside awards and bathing waters due to poor water quality, which can largely be attributed to riverine inputs and the use of combined sewer overflows.

There are a number of combined sewer overflows in the area, including at least two which flow into Aberdeen Harbour. The overflows are used when the system is flooded

* ICZM Indicator

[35] Types of bacteria abundant in animal faeces and sewage which are often indicators of disease causing organisms

with water, for example during periods of heavy rainfall. During this time the system is unable to cope and untreated sewage flows into rivers or the sea. In some cases the overflows are not screened, for example those which flow into Aberdeen harbour, which allows not only bacteria but also unsightly sanitary items to wash out onto local beaches.

5.9 Concentration of Nutrients in Coastal Waters

Decaying organic matter, nitrates and phosphorous enter coastal waters via rivers, generally from agricultural run off and sewage discharges. Moderate inputs enhance plant growth and can have a number of benefits. However, high level inputs lead to excessive plant growth and oxygen depletion due to bacterial decay of dead plant material and ultimately to eutrophication[36]. Eutrophication has associated with it, a number of problems including the development of algal blooms and algal mats and their associated consequences, as well as oxygen depletion in bottom waters. The Ythan Estuary was designated as Scotland's first Nitrate Vulnerable Zone (NVZ) to help control levels of nutrients entering local waterways. The catchment is intensively farmed and the resulting nutrient enrichment has led to the growth of macroalgal mats on the estuary), leading to anaerobic conditions beneath them and ultimately reducing the diversity and productivity of the habitat.

The four main rivers on the East Grampian coast are the Ugie, Ythan, Don and Dee. Figure 5.25 and 5.26 show the inputs of nitrogen and phosphorous to coastal waters from these rivers*. Data for the Waters of Philorth is currently unavailable. The levels of Total Phosphorus have shown a drop since 2000. The levels of Nitrates have remained stable.

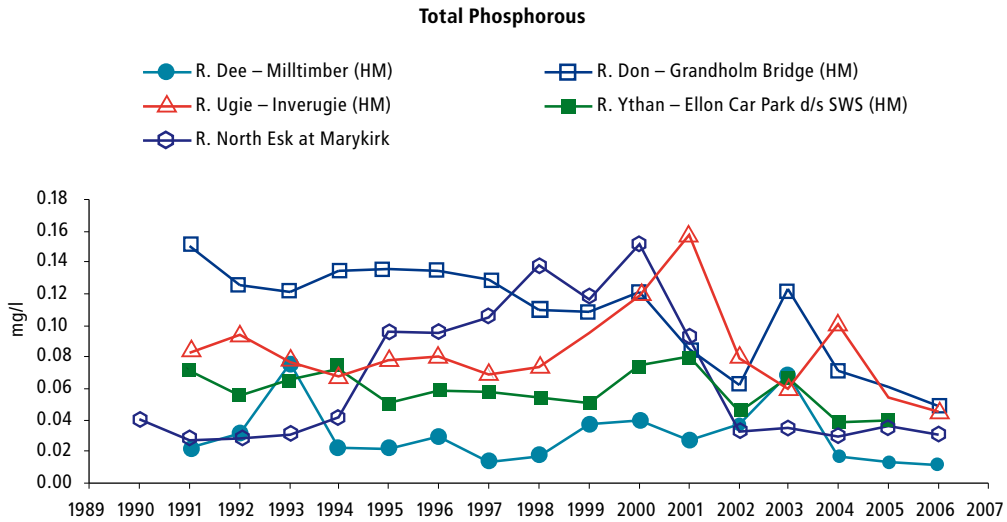


Figure 5.25 Total Phosphorus levels for local rivers 1995–2006 (SEPA and Macaulay Land Use Research Institute, 2008)

[36] An increase in chemical nutrients leading to excessive plant growth

* ICZM Indicator

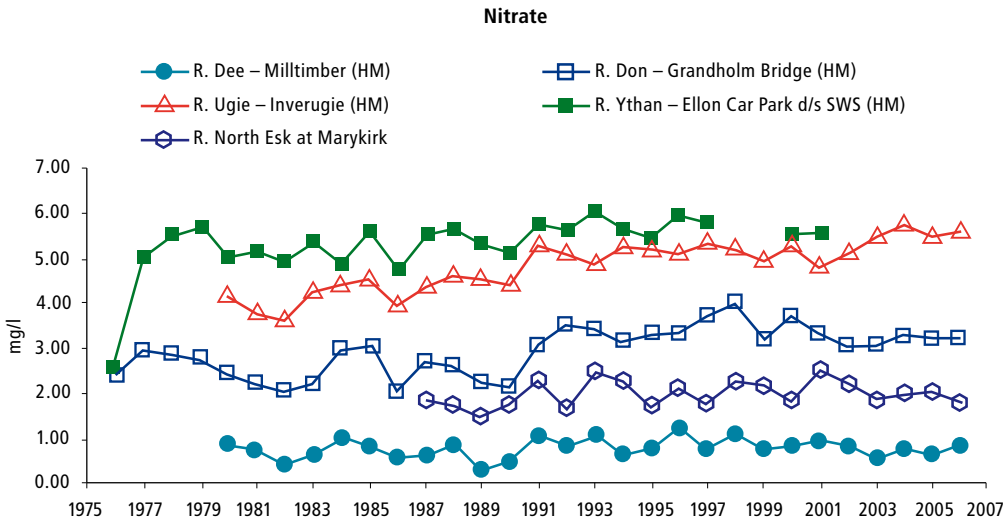


Figure 5.26 Nitrate levels for local rivers 1995–2006 (SEPA and Macaulay Land Use Research Institute, 2008)

KEY SUMMARY POINTS:

- Seaside awards are given to beaches meeting set criteria including good water quality; no pollution; litter management; information provision; community involvement; safety measures and active management.
- The East Grampian coast has seven beaches with the award including Aberdeen; Stonehaven; Balmedie; Collieston; Fraserburgh Esplanade and Waters of Philorth; and Peterhead Lido
- The area has seven bathing waters designated under the revised Bathing Waters Directive, which are required to meet European water quality levels
- The levels of faecal coliforms in the water are used as a measure of quality
- Poor water quality in this area can largely be attributed to agricultural run off though the discharge of human sewage is still a problem in some areas
- The Ythan Estuary was designated as Scotland's first NVZ due to its nitrogen input

SOURCES OF FURTHER INFORMATION;

- Seaside Award criteria – Keep Scotland Beautiful www.keepscotlandbeautiful.org
- Blue Flag criteria – Blue Flag www.blueflag.org/Criteria/Beaches
- Harmonised Monitoring Scheme – http://www.sepa.org.uk/science_and_research/data_and_reports/water/scottish_river_water_quality.aspx

ACTIONS: (action partners)

- Identify beaches eligible to apply for a Seaside Award (EGCP)
- Work with Local Authorities to attain further Seaside Awards for the East Grampian coast, where beaches meet the necessary criteria (EGCP and local authorities)
- Identify potential Blue Flag beaches and carry out a gap analysis to identify failing areas (EGCP)
- Identify potential bathing waters (EGCP)

- Work with river managers to reduce the levels of coliform and faecal coliforms entering the River Dee from livestock grazing and poaching (EGCP and River Dee working groups)
- Work with SEPA, Scottish Water, Aberdeen Harbour Board and the River Dee Project Officer to reduce the levels of human sewage entering Aberdeen Harbour via overflows (EGCP)
- Support ongoing efforts to reduce the consequence of nitrogen leaching in the Ythan NVZ (EGCP)

5.10 Marine Litter

5.10.1 Impacts of Marine Litter

Marine and coastal litter are substances introduced into the marine environment which may result in hazards to human health or harm to living resources and marine ecosystems. Litter can be categorised by type, for example plastic, sanitary and polystyrene or via source (direct littering via beach users, fishing, sewage related debris (SRD) and shipping) (Clark, 2002). There are a number of threats from marine litter to both the marine environment and the species within it. These can include the entanglement of marine species, particularly turtles (Carr, 1987; Mascarenhas et al., 2004), fish (Sazima et al., 2002), mammals (Edyvane et al., 2004; Arnould and Croxall, 1995; Boren et al., 2006) and birds (Arnould and Croxall, 1995). Studies have shown marine species may ingest plastic particles, seemingly mistaking them for prey. Ingestion has harmful effects such as a worsening physical condition (Godley et al., 1998); reduced food stimulus (Ryan, 1988); blockage of gastric enzyme secretion; lowered steroid hormone levels; reproductive failure (Azzarello and van-Vleet, 1987); internal injury and death following blockage of the intestinal tract (Ryan, 1988; Beck and Barros, 1991). Drift debris has been shown to increase the distribution of particular marine organisms and alien species (Winston, 1982; Barnes, 2002; Barnes and Milner, 2005). Barnes (2002) estimated that marine litter from anthropogenic sources more than doubles the rafting opportunities for biota, assisting the dispersal of alien species.

5.10.2 The Costs of Marine Litter

The effects of litter extend far beyond ecological impacts; it has also been shown to have negative effects on fisheries (Lart, 1995); aquaculture; human health (Rees and Pond, 1994); recreation (Rees and Pond, 1995; Morgan *et al.*, 1993); navigation; military activities; power generation; seawater abstraction; flood defence; agriculture; and aesthetic impacts. These impacts have associated economic costs. The potential economic annual impact, as shown in figure 5.27 highlights the need to source and reduce marine and coastal litter. The UK total shows that the effects of litter in the maritime environment go far beyond ecologically and aesthetic impacts and that it is a considerable drain on the already limited resources available for coastal management in the UK.

Sector	Qualitative Impact	Potential Economic Impact (£/year)	Explanation of Extrapolation
Ecological impacts	Entanglement, ingestion, smothering, beach cleaning	Unknown	What value can be applied to the potential decline and thus protection of a species?
	Long Distance transport	Unknown	Could be high based on freshwater examples
	Toxic poisoning	Unknown	Potentially high - more research needed
Fisheries	Oil industry related (UKOOA fund)	250,000	
	Net and boat (propeller) damage from other litter sources	23,400,000	Based mainly on Shetland experience £6,000 to £30,000 /yr/boat (KIMO, 2000). UK total no of fishing boats =7,800 ((MCS, 2000a); assume 50% of boats affected (3,900) as at Shetland x by £6k.
Aquaculture	Cage Clearance etc.	316,800	Shetland experience (KIMO, 2000) 1 hr (= £80)/month* c.30 farms
	Fouled Propellers and intakes	594,000	Between £150 and £1,200 per incident. Therefore using £150 x 330 boats x 1 incident / month
Tourism	Direct costs – designated beaches	1,781,543	Av. Cost of beach cleaning £7,953/km/yr (KIMO, 2000)* total length of UK bathing beaches (267 km)
	Direct costs – non-designated beaches	5,423,964	Average beach cleaning cost as above (£7,953) x estimated length of non-designated beaches cleaned (682km)
	Hidden costs	157,000,000	£6–9m just for Kent. Difficult to extrapolate as tourists may relocate elsewhere therefore loss may not be uniform across UK. Assume costs 1/6th of the minimum for Kent (£1m) x 157 coastal authorities sampled by KIMO (2000).
Navigation (non-military)	Recovery and disposal of litter in ports/harbours	5,600,000	Average of Port Leith (£3000/yr) and Shetland Harbour Trust (£13,000/yr) = £8,000 x the 700 UK ports/harbours (MCA, pers comm.).
	Rescue Services	440,000	200 incidents around UK in 1998 (KIMO, 2000)* min. RLNI cost of £2,200
Military activities and navigation	Damage, propeller entanglement and navi-gational hindrances	Unknown	Unable to quantify at present
Power generation	Screen clearances of coastal stations	414,000	£43,000/yr clearance costs at Aberthaw, plus performance decline of £26,000/yr* 6
Seawater abstraction	Blockages and damage	▸100,000	Up to £50,000/yr/abstractor
Flood Defence	Litter clearance activities	up to 40,000	England and Wales only
Agriculture	Litter clearance and harm to livestock	600,000	Majority of impact expected to occur in Shetland (KIMO, 2000)
Aesthetic intangible costs	Property devaluation etc.	Unknown	Could be considerable
Litter survey programmes		▸36,000	UK organisations involved in UK survey work (20) using 3 people/organisation (min) twice a year (min) x £300/day.
Prevention and education programmes		▸250,000	All the following have varying numbers of people carrying out such work: BMIF, MCA, DETR, Agency, MCS, TBG, NALG, Bag It & Bin It. Could assume 200 people working 4 days at £300/day
TOTAL		**196,246,000**	

Figure 5.27 The impacts and potential economic costs of marine and coastal litter (MaLiTT, 2002)

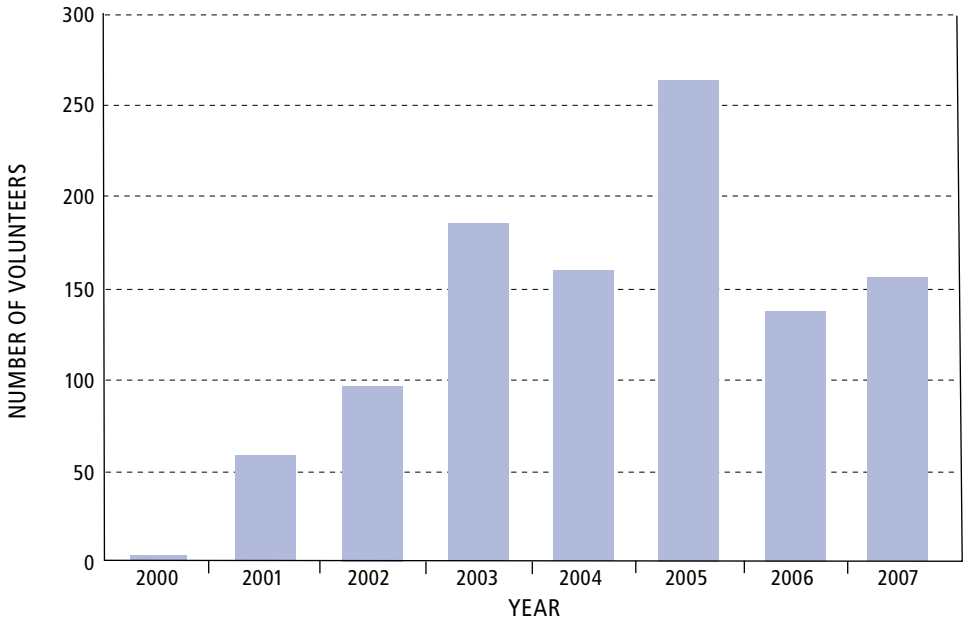
5.10.3 Adopt a Beach and Beach Watch

The Marine Conservation Society (MCS) have been collating data through the Beach Watch initiative since 1993. As part of this, Adopt a Beach was set up, whereby local people 'adopt' their favourite stretch of coast and help keep it litter free by taking part in quarterly or annual cleans. The information from this, on the amounts and types of litter found helps MCS source and reduce the levels of litter on UK beaches. The following figures show the data from the beaches along the East Grampian coast participating in Beach Watch for the previous seasons; including numbers participating, area surveyed (figures 5.28 and 5.29), the amounts (figures 5.30 and 5.31) and types (figure 5.32) of litter collected and its potential source (figures 5.33 and 5.34).

Year	Total Number of Volunteers	Length Beach Surveyed (m)	Items/km	Total Number of Bags Collected	Total Weight of Bags Collected (Kg)
2000	3	7790	1566	31	156
2001	57	5872	1156	40	206
2002	95	8487	922	111	1213
2003	184	11577	1305	147	344
2004	159	23870	681	184	455
2005	263	27660	775	181	451
2006	137	16100	1029	187	364
2007	155	8925	2073	196	1060

Figure 5.28 Elementary data for Beach Watch and Adopt a Beach (2000-2007)* (MCS, 2008)

Figures 5.28 and 5.29 are encouraging as they show an overall increase in the numbers participating in the clean ups since 2000. The more recent extremes in numbers taking part (for example the high numbers of participants in 2005 followed by lower numbers in 2006) may be attributed to weather, with fewer participating during heavy rain.



* ICZM Indicator

Figure 5.29 Number of volunteers participating in Beach Watch and Adopt a Beach (2000-2007) (MCS, 2008)

Figure 5.30 shows the number of bags collected but it is not felt this can be used as an indicator for the levels of litter; rather it could be due to changes in the types of litter, with larger items collected thus filling bags more quickly or improved safety briefings given by the event organisers highlighting the dangers of overfilling bags.

Since 2000 there was an initial decrease in litter collected (2000–2002) and then a steady increase from 2004, with 2007 having more than double the number of items collected per kilometre (figure 5.31). This may be attributed to a higher density of litter, allowing similar numbers of participants to collect substantially more rubbish. When compared to the Scotland 2007 average (2054) the East Grampian coast had a higher number of items per km (2073). Overall there has been an increase in volunteers, but further work is needed. Other areas have a much greater percentage of their coast adopted and it is felt we should strive for this on the East Grampian coast.

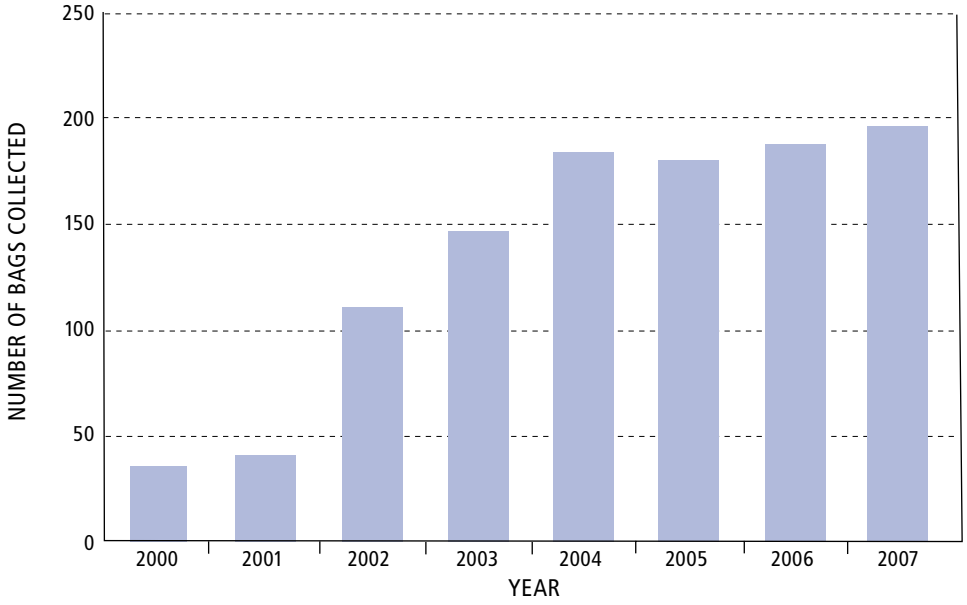


Figure 5.30 Number of bags of litter collected in Beach Watch and Adopt a Beach (2000–2007) (MCS, 2008)

The material type (%) (figure 5.32) collected during Beach Watch appears to have remained fairly constant over the data period, with plastic consistently accounting for the largest percentage. Polystyrene showed a noticeable increase in 2007 but this is as a result of large amounts washing up on one beach (St Combs) rather than an overall increase across the area. Sanitary waste has shown an encouraging decrease.

Figure 5.33 and 5.34 show the potential source of the litter, which is categorised by the MCS. The highest percentage of waste sourced appears to come from litter left by beach visitors and from the fishing industry. However, this is notoriously difficult to define and as such, much of the litter collected is categorised as non-sourced.

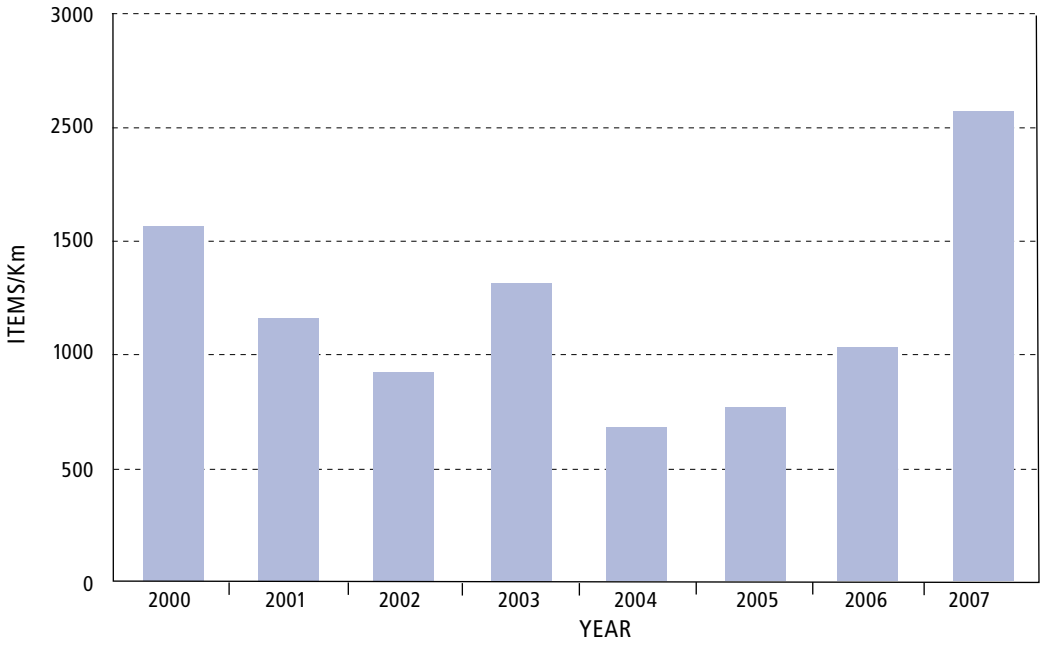


Figure 5.31 Number of items per km collected in Beach Watch and Adopt a Beach (2000-2007) (MCS, 2008)

Material Type %	2000	2001	2002	2003	2004	2005	2006	2007	Scotland 2007
Plastic	66.06	73.09	54.91	67.76	69.46	61.85	65.28	59.04	58.3
Polystyrene	11.57	3.37	7.96	5.59	9.69	8.55	9.32	24.19	7.7
Rubber	2.29	1.56	1.16	2.22	1.47	1.44	1.72	1.03	2.4
Cloth	2.18	2.95	1.11	2.05	1.77	4.21	3.23	2.89	3.4
Metal	3.24	1.87	4.15	4.98	2.69	5.92	4.44	2.69	6.1
Medical	0.10	0.21	0.06	0.18	0.27	0.16	0.18	0.23	0.2
Sanitary	8.44	10.36	3.67	4.54	6.54	5.07	5.15	2.13	6.1
Faeces	0.09	0.01	0.21	0.22	0.30	0.76	0.23	0.20	0.5
Paper	2.34	0.84	4.36	4.96	3.97	7.45	7.02	4.95	8.5
Wood	2.11	3.79	20.87	3.03	1.33	1.70	1.68	1.36	2.3
Glass	1.46	1.87	1.30	4.39	2.12	2.29	1.52	0.96	3.9
Pottery	0.13	0.07	0.24	0.09	0.41	0.60	0.25	0.33	0.6

Figure 5.32 Material type (%) collected during East Grampian beach cleans (MCS, 2008)

Potential Source %	2000	2001	2002	2003	2004	2005	2006	2007	Scotland 2007
Beach visitors	23.72	29.30	31.90	35.88	31.37	37.30	37.75	27.83	35.3
Fishing	18.76	19.60	13.16	19.85	18.64	17.90	16.07	18.79	13.7
Fly Tipping	0.34	0.24	0.27	0.69	0.58	1.38	0.49	0.54	0.9
Medical	0.10	0.21	0.14	0.08	0.27	0.16	0.18	0.23	0.2
Non Sourced	45.88	36.77	27.31	66.75	40.36	36.30	38.46	49.24	41.9
Shipping	2.76	3.54	2.40	3.15	2.24	1.89	1.90	1.25	1.8
SRD	8.44	10.36	3.58	4.75	6.54	5.07	5.15	2.13	6.1

Figure 5.33 Potential source (%) of litter collected during East Grampian beach cleans (MCS, 2008)

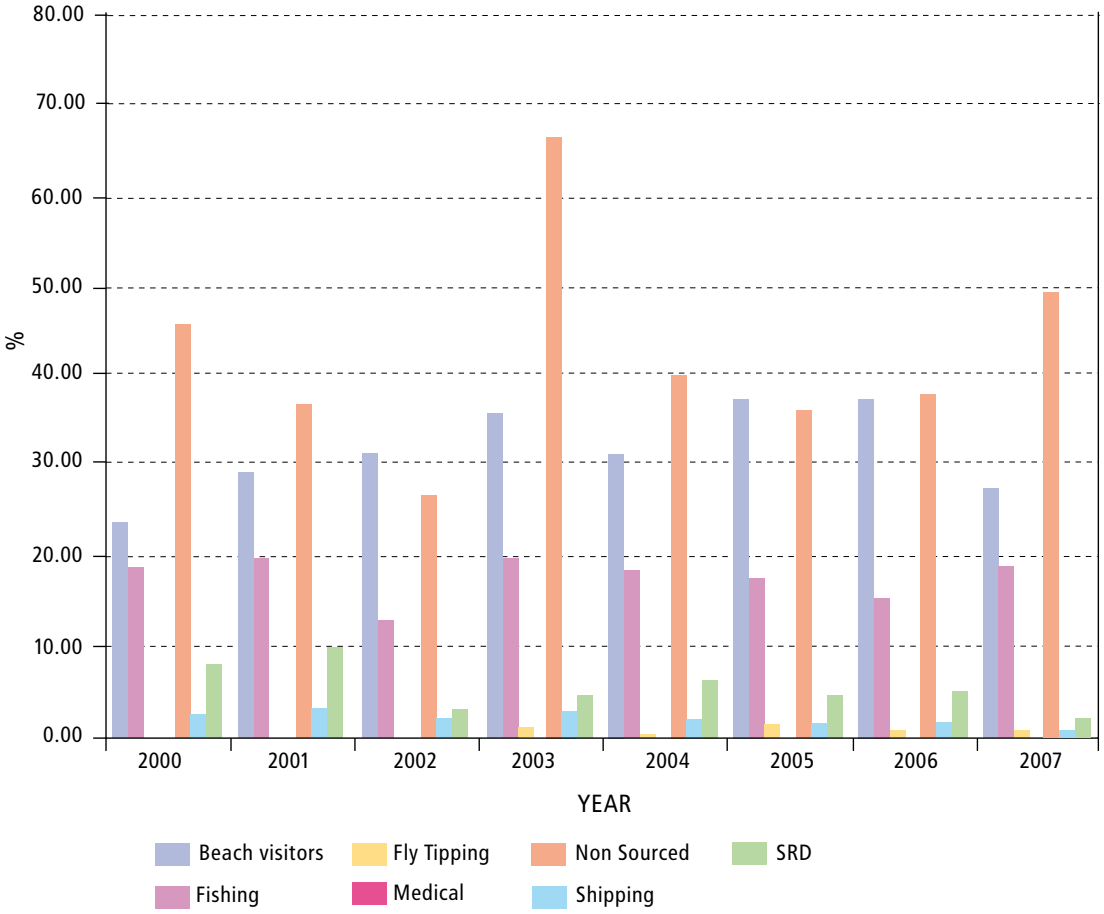


Figure 5.34 Potential source (%) of litter collected during East Grampian beach cleans (MCS, 2008)

The Adopt a Beach initiative appears to be a worthwhile scheme to support and promote, as research has shown that a sense of ownership will help to reduce beach litter as participants are more inclined to clean if it is perceived as 'their' beach (Storrier and McGlashan, 2006). Currently there are 15 beaches adopted or taking part in Beach Watch in the area. However, the frequency of which they are cleaned and to what level, varies immensely. In addition to cleaning beaches it is recommended that time is devoted to reducing the litter at source.

A visual inspection of our local coastline shows litter is still a problem. Litter can be found all along the East Grampian coast in low density, with a number of collections points (natural and human induced), where litter is at a much higher level (figure 5.35).

Figure 5.35 Cairnbulg near Fraserburgh, one of the natural collection points for litter along the East Grampian coast (Hastings, E. 2006).

5.10.4 Marine Litter and the Law

There are no lead bodies charged with dealing with marine and coastal litter in Scotland. However, the Code of Practice on Litter and Refuse (Scotland) 2006 has been produced under section 89 (7) of the Environmental Protection Act 1990 (EPA). The code provides guidance on duties including responsibilities. It states that Duty Bodies (mainly Local Authorities but also includes some land owners) are responsible for keeping beaches clear of litter as far as practicably possible. The Code of Practice is based on the following two principles:

- Areas which are habitually more heavily trafficked should have accumulations of litter cleared away more quickly than less heavily trafficked areas; and
- Larger accumulations of litter and refuse should be cleared more quickly than smaller accumulations.

Based on levels of use and time it sets standards of acceptable levels of cleanliness. It is not based on the frequency of cleaning, rather the maintenance of an area's cleanliness. Scotland's beaches are categorised into one of four zones;

- Amenity Beach (Blue Flag beaches and those adjoining designated bathing waters)
- Recreational Beach (managed beach, award winning beach or beach adjoining other SEPA sampled waters)
- Sensitive Conservation Area (SSSIs, SPA's, SAC's and nature reserves)
- Other Beach (any other beach)

The Code is based on four grades of cleanliness;

- Grade A: no litter;
- Grade B: predominantly free of litter, other than a few small items;
- Grade C: widespread distribution of litter with minor accumulations;
- Grade D: heavily littered with significant accumulations.

If the level of cleanliness falls below a Grade B, the Code sets a response time in which the Duty Body must restore the land to its given standard depending on the time of year and the zone in which that beach falls (figure 5.36). For example if a recreational beach should deteriorate to a Grade C or D in July it should be returned to a Grade B within one week.

	GRADE				
	A	B	C	D	
Amenity Beach		←	48 hrs 4 wks		(1st Jun to 15th Sept) (16th Sept to 31st May)
Recreational Beach		←	1 wk 4 wks		(1st Jun to 15th Sept) (16th Sept to 31st May)
Sensitive Conservation Area		←			Monthly hand picking of litter
Other Beach		←			As Necessary

Figure 5.36 Timescale to return beaches to appropriate grade, based on beach type and time of year (KSB, 2009).

The EPA gives rights to take action if the timescales and levels of cleanliness are not adhered to. If, after putting a complaint in writing to the Duty Body, action is not taken, a member of the public can take legal action to get a Litter Abatement Order whereby the duty body must clean up the area. There is a charge to apply for an Order and it can be time consuming but it has been successfully used in the past.

5.10.5 Litter Initiatives

Aside from Adopt a Beach and Beach Watch a number of other marine and coastal litter schemes exist including KIMOs' Fishing for Litter project. KIMO is an international association of Local Authorities, which was founded in Denmark in 1990 to work towards cleaning up pollution in the North Sea. 'Fishing for Litter' aims to clear litter in the North Sea by bringing it ashore as it is trawled up as part of fishing activities and disposing of it on land. The participating vessels are given hardwearing bags which are deposited on the quayside where the participating harbours monitor the waste. The project provides the bags and covers the waste costs and the fishermen and harbours volunteer their time.

Fishing for Litter Scotland aims to set up a network of 10 harbours to allow the boats participating in the scheme the flexibility to leave from one port and deposit litter at another. In the long term KIMO hopes to persuade National Government to provide funding for the scheme. UK ministers have since agreed to support the project.

There are currently ten harbours participating in the Fishing for Litter Scotland initiative including Peterhead (13 vessels registered) and Fraserburgh (12). Aberdeen Harbour has withdrawn from the project as the disposal skips were not used in the two years they were in place.

KEY SUMMARY POINTS:

- Sources of litter include direct littering via beach users; fishing; sewage related debris; and shipping
- Litter threatens wildlife in numerous ways including entanglement; Ingestion; ghost fishing from discarded nets; blockage of the intestinal tract; and increased dispersal of alien species via litter rafts
- The effects of litter extend far beyond ecological impacts; it has also been shown to have economic impacts on fisheries; aquaculture; human health; recreation and leisure usage; navigation; military activities; power generation; seawater abstraction; flood defence; agriculture; and aesthetic impacts
- A number of initiatives have been set up to reduce litter including adopt a beach and beach watch which monitor levels through annual beach cleans and surveys
- Data shows an increase in the numbers participating in the clean ups, and also a large increase in the litter levels for 2007
- The highest percentage of waste sourced appears to come from litter left by beach visitors and from the fishing industry
- There is no lead body responsible for cleaning coastal litter but local authorities are charged with keeping them to an acceptable standard

SOURCES OF FURTHER INFORMATION:

- Beachwatch Report, Marine Conservation Society 2007 http://www.adoptabeach.org.uk/pages/page.php?cust_id=20

ACTIONS: (action partners)

- Support Adopt-a-beach programme (EGCP)
- Undertake a publicity campaign to encourage participation in adopt a beach (‡) (EGCP)
- Coordinate best practice in educating the public on the effects of beach and marine litter
- Utilise the EGCP website to inform people about the effects of marine and coastal litter and how they can help to reduce it (EGCP)
- Discourage balloon releases by local businesses and their use as promotional gifts. Work with local authorities to achieve a full ban (‡) (EGCP and local authorities)
- Work to tackle litter hotspots for example Cairnbulg. Identify the source(s) of litter and work to reduce it (EGCP)
- Confirm the situation for the future of Fishing for Litter (EGCP)
- Encourage beach retailers to use the ‘Food on the Go’ code of practice (‡) (EGCP and KSB)
- Work with local authorities to ensure adequate waste disposal facilities. These should not be the open sided type as litter is blown from them or removed by birds (‡) (EGCP and local authorities)
- Work with SNH to improve the marine litter information in the Sea Chest and ensure the pack contains details of adopt a beach (EGCP)
- Work with SEPA, Aberdeen Harbour and Scottish Water to reduce the levels of untreated SRD entering Aberdeen Harbour via overflows without adequate screening (‡) (EGCP)
- Identify areas elsewhere where poor screening is a problem and work to rectify it (‡) (EGCP)

(‡) Beach Watch Report 2007 Key recommendations

5.11 Contaminated Land

One site along the coastline of Aberdeenshire has been formally identified and registered as contaminated, under Part II of the Environmental Protection Act 1990. Blackdog, which was registered as contaminated in 2004, is a former sand extraction pit approximately 8km north of Aberdeen that was then landfilled between 1982 and 1993. The landfill and the adjacent dunes and foreshore registered as contaminated cover an area of 16.9ha in total (Aberdeenshire Council, 2006). The site was used to dispose of domestic, commercial and industrial wastes including North Sea drill muds using the dilute and disperse principle. This method of leachate management involves waste being buried with no lining and instead relies on the low permeability of the subsurface to control groundwater pollution whilst diluting and purifying by a process of sorption and filtration (Allen, 2001).

Hydrocarbons from the site have now been found to be leaching and percolating through to the groundwater, dune and beach areas resulting in pollution of controlled waters. After periods of heavy seas, the pollution is clearly visible on the foreshore (figures 5.37, 5.38 and 5.39).

Figure 5.37 Leachates are clearly visible at the toe of the foredunes (Hastings, E. 2008)

Figure 5.38 Leachates are clearly visible at the toe of the foredunes (Hastings, E. 2008)

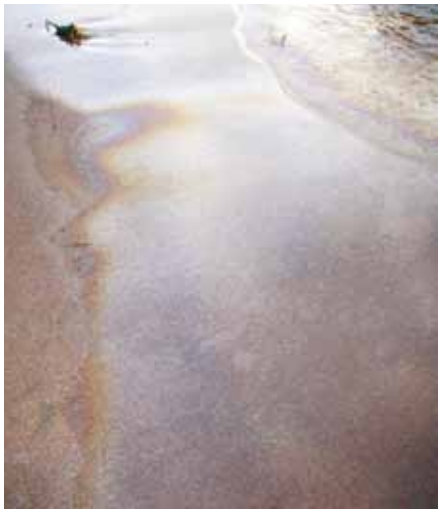


Figure 5.39 Oil on the foreshore (Hastings, E. 2008)

The situation is being exacerbated by dune erosion and an overall lowering of the beach levels during the winter months, which is exposing the waste below and behind the foredunes. This area in particular may suffer from a low sand supply due to the northward drift of beach sediment combined with the groyne system to the south of Blackdog at Aberdeen Beach. Due to the direction of the longshore drift, the mouth of the Blackdog burn (which intersects the site) is deflected northwards and travels above MHWS alongside the foredunes for some distance before turning towards the sea (figure 5.40).

Figure 5.40 The northwards deflection of the Blackdog burn (GoogleEarth 2008)

The action of the water is further eroding the base of the dunes and as such a successful planning application was submitted to redirect the burn, including;

- Excavation of a new channel at the southern toe of the sand dune
- Install a one meter wide gravel base within the channel
- Install blocks (rock filled gabions) on one side of the channel
- Install scour protection
- Installation of a training wall (to prevent future northwards movement of the burn)
- Filling in of the existing burn

(Golder Associates, 2007)

Details of contaminated sites in Aberdeen City have yet to be released but it is thought 800 potentially contaminated sites have been identified. However, no site has formally been identified and as such the details are not yet available via public register.

5.12 Radioactivity

Radioactivity is a natural occurrence; seawater is naturally radioactive largely due to the presence of potassium-40. The low solubility of the particles in water often results in their accumulation in sediments; with finer sediments such as muds adsorbing higher concentrations. Radioactive particles can also be inputted into the marine environment through anthropogenic activities such as nuclear power stations and weapons testing.

Radioactive particles have been found on Aberdeen beach. SEPA have deemed that the health risk to beach users is negligible though will continue to monitor the area on an annual basis. It is thought the particles have been discharged from the pipework of a former fertiliser works. It is also possible the particles were as a result of natural water and sediment movements.

KEY SUMMARY POINTS:

- One site along the East Grampian coast has been confirmed as contaminated.
- Blackdog was used as a landfill for drill muds which have since began to leach onto the foreshore and inshore waters
- A planning application has been submitted to canalise Blackdog burn to slow the dune erosion and reduce the pollution
- A number of radioactive particles have been found on Aberdeen Beach

SOURCES OF FURTHER INFORMATION:

- Public Register of Contaminated Land, Aberdeenshire Council http://www.aberdeenshire.gov.uk/environmental/strategy/PublicRegisterSummary.pdf
- Planning Application Diversion of the Blackdog Burn http://www.aberdeenshire.gov.uk/planning/apps/detail.asp?ref_no=APP/2007/3392

5.13 Pollution Incidents

The number, location and volume of pollution spills are recorded annually by the Advisory Committee on the Protection of the Seas. The survey is conducted on behalf of the Maritime and Coastguard Agency and records incidents involving discharges of oil, noxious liquid substances and rubbish from vessels and offshore installations. The survey report describes the different categories and types of reported discharges along with their locations and estimated volumes. Figure 5.41 shows the details of the reported incidences in this area since 2001. From this it can be seen that there is a general increase in spills for the period 2001–2006 with the last two years having fewer incidences reported.

Year	Reporting location	Number of Incidents	Volume	Additional details
2001	Aberdeen Harbour	5	Minor	4 oil spills, 1 cargo waste
2002	Peterhead	5	10–455 litres/spill	Oil spills
	Aberdeen	4		1 lubrication oil, 1 fish oil sheen, 1 crude oil sheen, 1 minor spill from a pleasure craft, R. Ythan
2003	Aberdeen	10	23–100 litres/spill	9 from offshore support vessels, 1 fishing vessel
	Peterhead	1	Minor	
	Offshore	1	Unknown	
2004	Aberdeen	12	2.9 tonnes in total	10 from offshore support vessels, 12 fishing vessel
	Fraserburgh	1	4.5 tonnes	Heavy crude oil
	Peterhead	3	Unknown	
2005	Fraserburgh	1	1.8 tonnes	Diesel from a sunken vessel
	Aberdeen	9	3.9 tonnes in total	
2006	Aberdeen	6	Average spill 4 litres	5 oil, 1 chemical spill

Figure 5.41 Details of the reported pollution incidences in this area since 2001

SOURCES OF FURTHER INFORMATION:

- Annual Survey of reported Discharges, UK Marine and Coastguard Agency www.mcga.gov.uk

5.14 Climate Change

When studying the climate, long term trends are used to give an average value of which to compare against. The term 'normal' for these datasets is calculated as the average of all the measurements made between 1971 and 2000. Fisheries Research Service collects climate information for Scotland. Their work has shown that air temperature at the coastal monitoring site in Dyce is once again above normal during 2004, which is in line with the results from other Scottish coastal monitoring locations. Rainfall was variable at all sites. During 2005, despite the temperature being generally above normal, sunshine hours were variable and often below normal (FRS, 2007).

During 2004 average sea surface temperatures at Peterhead were generally warmer than usual, most noticeably during January and February where temperatures peaked at 7.0°C (normal being 6.3°C). In contrast to the other monitoring sites, August temperatures were close to normal though figures recorded for September were 0.8°C above normal conditions, these circumstances were also true through until December. In 2005 the temperatures in the shoulder months were warmer than the 30 year average, whilst those during the spring were close to, or below normal. July was the warmest month with a maximum sea surface temperature of 13.3°C (1°C warmer than normal). Dawson *et al.* (2001) observed that between 1977 and 1997 there was a pattern of short-term temperature rise with a range between 0.05 and 0.12°C/year, but when compared with records from the past 100 years there is no clear trend (FRS, 2007).

A coastal ecosystem monitoring site is also in place 5km offshore from Stonehaven, in a water depth of approximately 50m. Since 1997 weekly measurements of seawater temperature and salinity have been taken as well as water samples for the analysis of nutrients and plankton. Temperatures at the site tend to be highest in September and lowest during April. Salinity also has a similar seasonal cycle, with the lowest values occurring during April and the highest values around October (FRS, 2007).

During the period 1997 to 2005, the sea surface temperatures at Stonehaven showed the warming trend which has been observed at all sites in the North Sea, with peak temperatures recorded in 2003 and slightly lower temperatures in 2004 and 2005. The salinity decreased to a minimum in 2002 and started to rise again. From the monthly data it is apparent that the salinities during the summer months of 2005 were the highest recorded in the 10 year dataset (FRS, 2007).

The seasonal cycle for nutrients is a little different to that of temperature and salinity with nutrient levels at their highest during the winter. During the summer period the nutrient levels become very low as the nutrients are used up by phytoplankton growing during this time. During the period of measurement at Stonehaven (1997–2005) the level of nutrients in winter, particularly phosphate and silicate, increased and then decreased again (FRS, 2007).

Global sea levels have risen by 10 to 20cm during the 20th century. The tidal gauge in Aberdeen has shown a 7cm rise during the same period, with an overall rise of 0.6mm per year since 1862*. The rates of change in some areas are also affected by isostatic rebound following end of the last ice age. The rate of rebound is greatest in mainland areas where

the ice layer was thickest. Offshore areas were under thinner ice and consequently the extent of rise is smaller (Shennan, 1989). In areas where rebound is greatest, the rate of land uplift exceeds the rise in mean sea level resulting in falling sea levels relative to the land. Estimates of current and future sea level change for Scotland, adjusted to take account of uplift movements, are shown in figures 5.42 and 5.43.

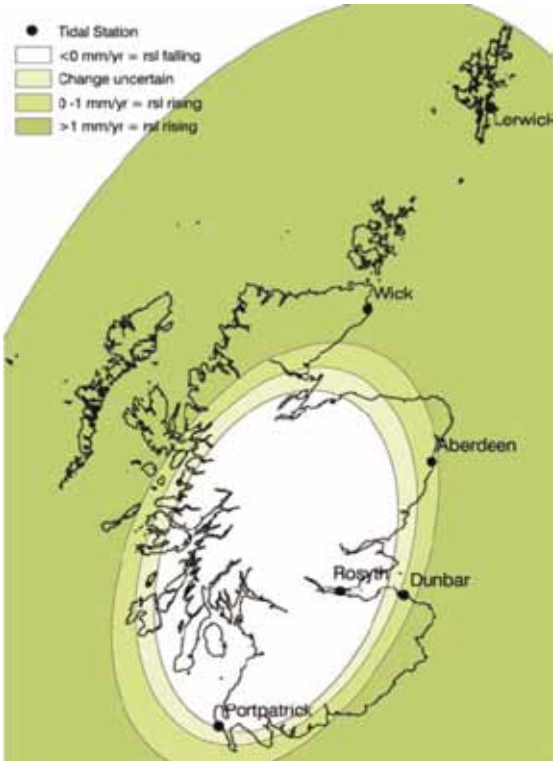


Figure 5.42 Current rates of sea level change in Scotland (Saunders 2004)

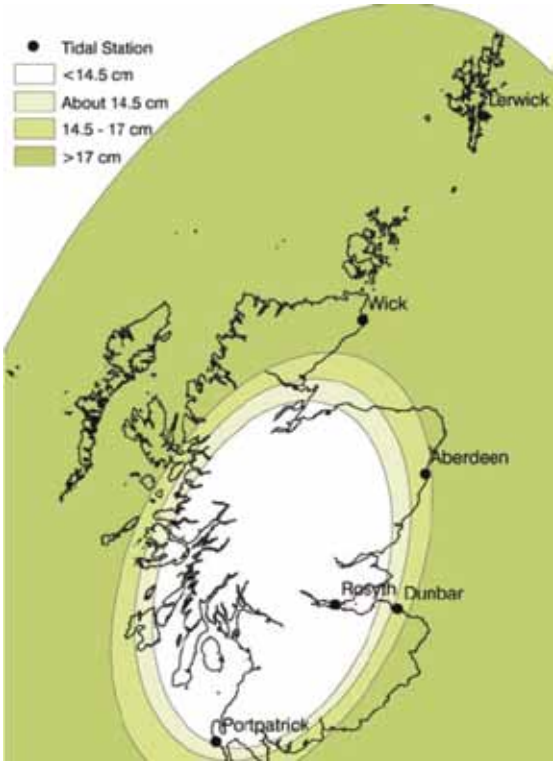


Figure 5.43 Estimates of sea level change in 2050 (Saunders 2004)

Research has shown that there is a significant possibility of water levels at Aberdeen reaching 60cm above the highest astronomical tide due to the influences of changing barometric pressures and wind drag on the sea surface, though a surge hazard assessment carried out as part of the research, rates Aberdeen as being at low risk. An increase in storminess has been detected in the NE Atlantic over the last 30 years, with an associated increase in significant wave height of 2.5–7.0mm per year (Ball *et al.*, 2008).

As a result of erosion and the heightened threat of coastal flooding, much work is required to identify at risk areas and suitable management strategies. One such method is the creation of a Shoreline Management Plan (SMP), which provides a large-scale assessment of the risks associated with coastal processes and shoreline evolution. It presents a policy framework to address the risks to people and the developed, historic and natural environment in a sustainable manner.

An SMP is a non-statutory, policy document for coastal defence management planning. It takes account of other existing planning initiatives and legislative requirements and is intended to inform wider strategic planning. It does not however set policy for anything other than coastal defence management.

* ICZM Indicator

A completed SMP will set out the short, medium and long term coastal defence policies for discrete sections of coastline. In doing so it will aim to build a consensus on these policies from a variety of interest groups but one which is based on sound technical, environmental and economic considerations. The SMP will also highlight areas where there is uncertainty in policy setting so that further more detailed work can be undertaken to developed a better understanding of the shoreline ahead of the next SMP review. Obtaining all of the necessary information and the writing of a SMP is due to begin in October 2009 for the North East area, as a joint project between Aberdeenshire Council, Aberdeen City Council and covering a small section of the Moray coast. Further details of this will be given in future editions of this report.

KEY SUMMARY POINTS:

- There has been a general increase in pollution incidences for the period 2001–2006 though this has decreased in the last two years
- Air temperature at the coastal monitoring site is once again above normal though sunshine hours have been variable and often below normal
- During 2004 average sea surface temperatures at Peterhead were warmer than usual
- During the period 1997 to 2005, the sea surface temperatures at Stonehaven showed the warming trend which has been observed at all sites in the North Sea
- During the 20th century the tidal gauge in Aberdeen has shown a 7cm rise though this is offset in part by isostatic rebound

SOURCES OF FURTHER INFORMATION:

- Scottish Ocean Climate Status Report 2004–2005, Fisheries Research Service www.marlab.ac.uk

ACTIONS:

- Assist with the production of the SMP where possible

6.0 DISCUSSION AND CONCLUSIONS

This report aimed to collate a range of qualitative and quantitative information on social, economic and environmental issues along the East Grampian coast. It was hoped trends would be highlighted from looking at past data and where this was not possible, to gather initial data sets to enable comparisons to be made in future editions of this document. In addition, this report has been written for East Grampian Coastal Partnership staff to identify problems and potential solutions and to steer the future work of the partnership. After writing this report it can be concluded that much information does exist on the local coast, though locating and gaining access to it has been difficult and time consuming. Large data gaps have been identified, particularly relating to social data at the local level.

In addition, this plan aimed to assess the health of the local coast and its communities against the Scottish average to indicate whether each of the aspects are good, satisfactory or where work is required and in need of improvement at the local level. This assessment has been given in the summary document and where it was felt improvement is needed or achievable, actions and partner organisations have been identified in an attempt to remediate the issue and are given with the individual actions throughout the report as well as in Appendix 2. It is recommended that each of the 'work required' issues and topics are taken forward as projects in order to fully meet the actions arising from this plan.

Overall, the social data collected shows the area to be performing well in terms of its society with many of the aspects being quite positive; the economic data shows high levels of variations, with some aspects performing much better than others. The environmental sections identify a number of failings, with the majority of aspects needing further work.

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APPENDIX 1 – STAKEHOLDER QUESTIONNAIRE

East Grampian Coastal Partnership

INFORMATION-GATHERING EXERCISE June 2008

EGCP is a voluntary group of individuals, with representatives from local authorities, industry, conservation bodies, recreation and tourism groups, local residents and many others with an interest in the wellbeing of the local coast from Fraserburgh to St Cyrus.

Why the Partnership was Created

The East Grampian coast has long played an important role in the lives of local communities and provides a wealth of environmental, cultural and economic resources. In modern society, these resources are under increasing pressure which may threaten their existence. Our work helps to improve their management and protect them for future generations.

We do this in a number of ways including;

- Community Involvement
- Research
- Preserving, enhancing and promoting the local coast
- Influencing national policy
- Helping to look after the local natural and cultural heritage
- Improving communication amongst stakeholders
- Initiating practical projects to solve real issues

We are hosted by the Macaulay Institute, Aberdeen and our core management group is made up of local authority representation, SEPA, SNH, Macaulay Institute, Aberdeen Harbour Board, University of Aberdeen and the Sea Watch Foundation.

We are currently writing a State of the Coast Report for the area from Fraserburgh to St Cyrus. The report aims to gather information on social, economic and environmental aspects of living and working in this area.

By producing this document we will provide an assessment of the East Grampian coast as it exists today and create a number of action points to help guide our work and ensure the future use and enjoyment of this rich and diverse stretch of the Scottish coastline.

If you think there is a particular issue related to the coast here, please let us know by filling in this short questionnaire. The issues are those that affect you!! So whether it is poor access, litter, limited job opportunities in traditional sectors or anything else... please let us know!

Thank you for taking the time to fill out this questionnaire, designed to capture information for a State of the Coast Report for the East Grampian Coast. We look forward to receiving your completed questionnaire. Please feel free to forward this to others you think may be interest.

PROJECT OFFICER: Emily Hastings
EGCP,
The Macaulay Land Use Research Institute
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01224 395150

Please note – Personal details will be used only if we need to contact you regarding any of your answers on this form. If there are any questions you do not want to answer please leave blank.

NAME _____

Are you completing this questionnaire as

a) local resident ☐

b) member of an organisation ☐

c) other (please specify) ☐ _____

TELEPHONE _____

ADDRESS _____

_____

EMAIL _____

What does the East Grampian coast mean to you?

Do you have a specific area of interest in the East Grampian coastline?

What specific issues do you think a state of the Coast report should consider?

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

THE STATE OF THE EAST GRAMPIAN COAST

Please give us details of any issues or activities of concern on the local coast between Fraserburgh and St Cyrus? These could include the following but if there is anything else you would like to tell us about please do not feel you have to limit your answer to these. Please use additional sheets if needed.

- Areas of potential conflict
- Specialist habitat areas
- Areas prone to erosion
- Areas prone to flood
- Tourism and Heritage Initiatives
- Economic development
- Conservation initiatives
- Access routes – current or proposed
- Heritage sites
- Areas, structures or access routes in need of repair or maintenance
- Areas covered by existing management plans.
- Important areas/routes for shipping/ boating whether industrial or recreational
- Areas of pollution/poor water quality
- Areas important to Fisheries

Please e-mail this back to us at e.hastings@macaulay.ac.uk to save paper. Thank you

APPENDIX 2 – ACTION PLAN

ASPECT	ACTION	PARTNERS	START DATE
2.9 NE LBAP	Work with NE LBAP to progress the local coastal and marine action plans and their targets	EGCP, NE LBAP, marine and coastal working groups	2009
3.2.3 Diversity of Employment	Work with local colleges and universities to promote fishing and maritime related courses	EGCP, Banff and Buchan College, University of Aberdeen	2010
	Support and promote events and activities which celebrate or maintain our knowledge of traditional industries	EGCP, local harbour and heritage groups	2010
3.6 Traditional Maritime Connections	Work with local groups and harbours and encourage them to organise hands-on heritage days where knowledge can be passed to younger generations	EGCP, Harbour and Community Groups	2010
3.7 Public Use of the Coast	Promote where possible the area's maritime and coastal visitor attractions	EGCP, tourism groups, visitor attractions	Ongoing
	Promote coastal related events to encourage participation	EGCP	Ongoing
	Work with partners to improve access to the coast	EGCP, Aberdeen City Council, Aberdeenshire Council, SNH	2009
	Encourage participation in adopt a beach	EGCP, MCS	Ongoing
4.3 Sustainability of Community Harbours	Work with local communities where required to obtain Harbour Revision Orders to change their constitutions from 'for profit' to 'not for profit' organisations to aid funding	EGCP, Harbour Groups	2010
	Harbours to consider Company Limited by Guarantee or a Scottish Incorporated Charitable Organisation status, to aid the running of the Trusts and improve the success of funding applications	EGCP, harbour groups	
	Submit an application for a Rural Seaside Award for Collieston to strengthen their funding applications	EGCP, Collieston Amenities Group	
	Good links with KSB	2009	
4.4.4 Training and Skills Shortages –North sea Oil and Gas	Work with the University of Aberdeen and Banff and Buchan College to promote maritime related degrees	EGCP, UOA, Banff and Buchan College	2010
4.5 Fisheries	Promote good fishing practices to recreational fishermen	SSCAN, EGCP	2010
	Promote the Marine Stewardship Council's sustainable fishing standards to inform shoppers of sustainable species	SSCAN, EGCP	2010
4.6 Coastal and Offshore Renewable Energy Production	Monitor the progress of the offshore wind development in Aberdeen Bay	EGCP	Ongoing
5.2 Coastal Geomorphology and Biodiversity	Work with NELBAP and the relevant working groups to ensure the coastal and marine HAPS are progressing and actions being met	EGCP, NELBAP, working groups	Ongoing
	Continue to monitor levels of quad bike use and restart QBLG as required	QBLG	
	Remove invasive species: Fallopia japonica	SNH, NELBAP, HAP working groups and land owners	2009
	Work with Forvie Reserve Manager to reduce the impact of windsurfers on breeding birds	EGCP, SNH, local windsurfing clubs	Ongoing
5.3 Marine Environment	Ensure work is carried out to meet the actions and targets from the Marine and Coastal Habitat Action Plans	EGCP	Ongoing
	Ensure the local biodiversity plans are monitored and updated where necessary	NELBAP	Ongoing

ASPECT	ACTION	PARTNERS	START DATE
5.6 Coastal Access	Undertake a survey of the coastal path to determine access points, condition and works required	EGCP, LA's	2010
	Investigate potential funding opportunities to continue and enhance the work of Nortrail	EGCP	2009
	Promote the use of the coastal paths via the EGCP website, newsletters and other literature produced	EGCP	Ongoing
	Make links to public transport including the dial a bus service during promotion	EGCP	2009
	Identify current gaps in the coastal path, with the aim of having a completed East Grampian coastal path	EGCP, LA's	2010
	Identify launch points for recreational users of non motorised and motorised transport	EGCP, LA's	2010
	Develop cycle access to the coast	Local authorities, local cycle forums, EGCP	2010
	Remove the 'No Cycling' signs from the coastal path south of Aberdeen in line with current access legislation	ACC, EGCP	2009
5.7 Seaside Awards	Identify beaches eligible to apply for a Seaside Award	EGCP	2010
	Work with Local Authorities to attain further Seaside Awards for the East Grampian coast, where beaches meet the necessary criteria	EGCP and local authorities	2010
	Identify potential Blue Flag beaches and carry a gap analysis to identify failing areas of the criteria	EGCP	
5.8 Designated Bathing Waters	Identify potential bathing waters	EGCP	
	Work with river managers to reduce the levels of coliform and faecal coliforms entering the River Dee from livestock grazing and poaching	EGCP and River Dee working groups	Ongoing
	Work with to reduce the levels of human sewage entering Aberdeen Harbour via overflows	EGCP, SEPA, Scottish Water, Aberdeen Harbour Board and the River Dee Project Officer	
	Support ongoing efforts to reduce the consequence of nitrogen leaching in the Ythan NVZ	EGCP	
5.10 Marine Litter	Support Adopt-a-beach programme	EGCP	Ongoing
	Undertake a publicity campaign to encourage participation in adopt a beach aimed at local residents and their local stretch of coast	EGCP	
	Utilise the EGCP website to inform people about the effects of marine and coastal litter and how they can help to reduce it	EGCP	2009 needs further work
	Discourage balloon releases by local businesses and their use as promotional gifts. Work with local authorities to achieve a full ban	EGCP, local authorities	2009
	Work to tackle litter hotspots for example Cairnbulg. Identify the source(s) of litter and work to reduce it	EGCP	2010
	Confirm the situation for the future of Fishing for Litter	EGCP	2009
	Encourage beach retailers to use the 'Food on the Go' code of practice	EGCP and KSB	2009

ASPECT	ACTION	PARTNERS	START DATE
	Work with local authorities to ensure adequate waste disposal facilities. These should not be the open sided type as litter is blown from them or removed by birds	EGCP and local authorities	2009
	Improve the marine litter information in the Sea Chest and ensure the pack contains details of adopt a beach	SNH and EGCP	2011
	Work with to reduce the levels of untreated SRD entering Aberdeen Harbour via overflows without adequate screening	SEPA, EGCP, Aberdeen Harbour and Scottish Water	Ongoing
	Identify areas elsewhere where poor screening is a problem and work to rectify it (*)(EGCP)	EGCP	
5.14 Climate Change	Assist with the production of the SMP where possible	EGCP	October 2009

East Grampian
Coastal Partnership

East Grampian
Coastal Partnership

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