

Dumfries and Galloway Council

State of the Environment Report

JANUARY 2017



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Introduction

This is the first report prepared by the Council considering a range of environmental aspects of Dumfries and Galloway's environment, including some social and economic factors. Where it has

been possible, data is presented to demonstrate trends over time whilst providing some narrative explanation of the figures and considers issues that may be arising.

Map 1: The Dumfries and Galloway Region



The Region

Dumfries and Galloway is located in south-west Scotland. To the north, the region shares borders with South Ayrshire, East Ayrshire and South Lanarkshire; to the east with Scottish Borders; and to the south with the county of Cumbria. Lying to the north of the Solway Firth and to the east of the Irish Sea, Dumfries and Galloway occupies a land area of approximately 6,439 km², making it the third largest of Scotland's 32 local authorities and has a coastline of 350km. Its population of approximately 147,284 is projected to fall to around 146,000 over the next 10 years.

Purpose of the Report

The purpose of this document is to bring together background information, statistics and trends in respect of the region of Dumfries and Galloway and includes the most up-to-date information available up to November 2016. For some sections, information and data has been collected for many years and therefore trends can be identified whilst in other areas, data and information is only just being brought together and for these, trends will emerge over time. The information presented in this document provides a foundation for predicting and monitoring environmental and other effects and helps to identify problems and alternative ways of dealing with them. Both qualitative and quantitative information can be used for this purpose using the most recent data available from a wide range of sources.

The systematic assessment and monitoring of the significant environmental effects of plans and strategies (such as the Local Development Plan) is a requirement of the Strategic Environmental Assessment (Scotland) Act 2005. As part of the Strategic Environmental Assessment (SEA) process, Environmental Reports (ER) are prepared to assess the environmental impacts of implementing plans, policies, strategies, etc. which includes considering baseline environmental information. The ER for the Local Development Plan (LDP) includes a set of objectives and indicators which assist in monitoring the effects of the LDP.

As a result, this report will:

- provide baselines of the current state of the region in terms of the environment, socially and economically, against which existing and future changes and trends can be compared;
- provide a basis for interpreting and reviewing the baseline information in an accessible way;
- identify areas for action (particularly in making changes to the LDP); and
- provide information to stimulate discussion and improve decision making

The chapters within the report are set out to consider environmental issues that affect the region as they are set out in the SEA process under particular topic areas. It is recognised that some issues may be considered under more than one topic but information will only appear in one chapter to prevent duplication.

Although this has been produced predominantly for the purpose of supporting and monitoring the outcomes of the Strategic Environmental Assessment (SEA) Environmental Report (ER) for the LDP, it is also considered to be a useful information source for other organisations and members of the public. While much of the data and information in this report is relevant for land use planning for which the LDP is responsible, it seeks to present a coherent overview of the local environment and therefore may also include matters which in practice planning is unlikely to make any significant impact.

1 Biodiversity, Flora and Fauna

Key issues

- there are a number of international and national designations across the region
- of the 29 international designations, 10 have some element that is in an unfavourable and declining state
- biodiversity generally is in decline but the rate of decline appears to be slowing
- invasive non-native species continue to spread
- approximately a third of the region is covered in woodland and forestry
- climate change may rise in significance in the future, adding to existing pressures

Topic Introduction

1.1 Biodiversity is the variety of living organisms from all sources including terrestrial, marine and other aquatic ecosystems. It includes genetic diversity within species, diversity between species and diversity of ecosystems. Biodiversity is integral to the functioning of ecosystems.

1.2 Dumfries and Galloway contains a wide variety of natural and semi-natural habitats from remote moorlands, through farmland to a diverse coastline and extensive intertidal estuaries. The quality and importance of these habitats is reflected in a range of national and international conservation designations, whereby large areas of the region are afforded statutory protection, as are a number of species found within them.

1.3 A duty to further the conservation of biodiversity was placed on all public sector bodies in Scotland in 2004. This biodiversity duty is about

connecting people with the environment and managing biodiversity in the wider environment, not just designated sites or species.

1.4 The second edition of the Dumfries and Galloway Local Biodiversity Action Plan (LBAP) was published in 2009. It identifies aims and objectives across the region and prioritises the actions that will achieve them. Around 100 organisations are part of the Dumfries and Galloway Biodiversity Partnership and have taken positive action towards LBAP targets. Individuals, land managers, communities, businesses, voluntary environmental groups and statutory agencies have all contributed successful projects, large and small, that have helped protect and enhance the special biodiversity of Dumfries and Galloway.

SEA Objective and Indicators

SEA Topic	SEA Objective	Indicators
Biodiversity, Flora and Fauna	To conserve and enhance biodiversity	Condition of designated sites Loss of designated sites Additional designated sites LBAP species/habitats stable or increasing Invasive Species control/expansion Area subject to restoration of ancient woodland. Area subject to restoration of peatland

Data and Trends

1.5 There are many different types of designations relating to biodiversity across the region as set out below:

- **Ramsar Wetlands of International Importance** - designated under the terms of the Convention on Wetlands of International Importance (the Ramsar Convention) to protect important wetlands, especially those used by migratory water birds and to ensure that wetlands are used wisely.
- **Special Areas of Conservation (SACs)** - a European wide network of important sites containing rare or endangered species and habitats designated under the terms of the EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (The Habitats Directive).
- **Special Protection Areas (SPAs)** - designated under the terms of the 1979 EC Directive on the Conservation of Wild Birds. These areas are specifically protected for their ornithological importance.
- **Sites of Special Scientific Interest (SSSI)** - key areas of marine or land-based conservation and wildlife importance. They are special for the nature conservation value of the plants, animals, habitats or rock formations that they contain and are designated by SNH under the provisions of the Wildlife and Countryside Act 1981.
- **National Nature Reserves (NNRs)** - areas of land set aside for nature, where the main purpose of management is the conservation of habitats and species of national or international significance and are designated under the Wildlife and Countryside Act 1981.
- **Local Nature Reserves (LNRs)** - places with special local natural interest, designated and managed by local authorities to give people better opportunities to learn about and enjoy nature close to where they live and are designated under the National Parks and Access to the Countryside Act 1949.
- **Local Wildlife Sites** - The purpose of such sites is to raise awareness of the habitats and species identified in the LBAP and encourage positive management.
- **Nature Reserves of Recognised Conservation Organisations** - A number of wildlife and/or community groups own/lease and manage land as nature reserves. Often these sites are valuable for biodiversity and/or geodiversity, but are especially valuable as a local amenity and educational resource.
- **Marine Consultation Areas - The Marine and Coastal Access Act 2009** allows for the creation of Marine Protection Areas (MPAs). MPAs protect a range of nationally important marine wildlife, habitats, geology and geomorphology, and can be designated anywhere in English and Welsh territorial and UK offshore waters
- **Local Geodiversity Sites** - These sites provide examples of geology and geomorphology of regional and local importance, where the geodiversity resource can be conserved, so that people can enjoy and find out more about it.

Table 1.1 indicates the range of statutory and non-statutory sites designated in the region including international, national and local designations (which are shown on Map 2). It should be

noted, however, that some sites have multiple designations and overlap and their total areas may include onshore and offshore areas and areas outwith the region where they are cross boundary.

Map 2: Nature Conservation Sites

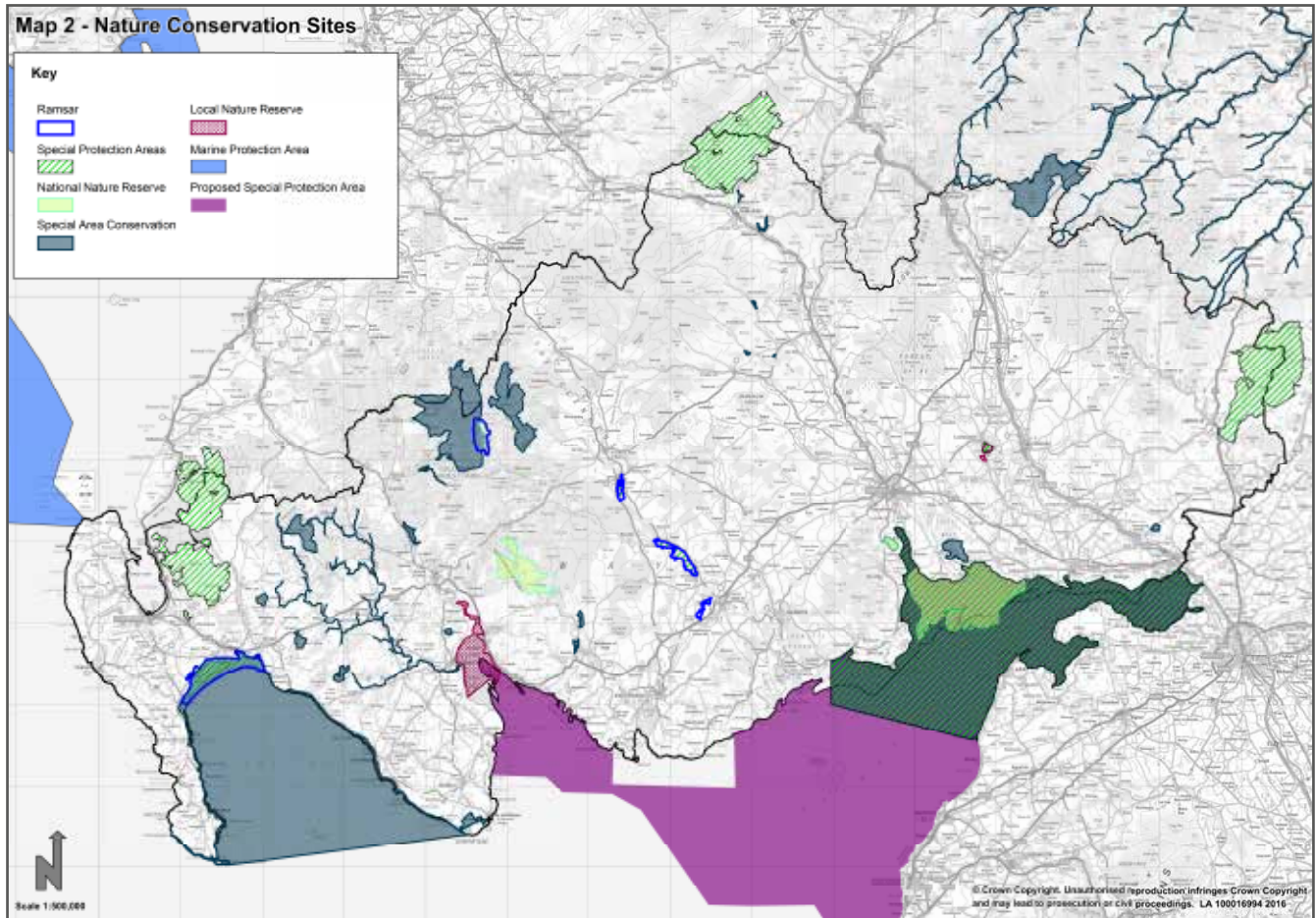


Table 1.1: Statutory Designations

Designation	Number of Sites	Total Area Covered in Hectares
Ramsar Wetlands of International Importance	5	33,760
Special Areas of Conservation (SACs)	17	107,164
Special Protection Areas (SPAs)	7	225,246
Sites of Special Scientific Interest (SSSI)	95	75,380
National Nature Reserves (NNRs)	2	10,107
Local Nature Reserves (LNRs)	2	2,982
Local Wildlife Sites	52	2,544
Nature Reserves of Recognised Conservation Organisations	22	unknown
Marine Consultation Areas	1	4,134
Marine Protection Areas	1	In total 712km ²
Local Geodiversity Sites	0	-

1.6 The condition of European sites are monitored by SNH and are shown in Table 1.2. Further information can be found at <http://gateway.snh.gov.uk/sitelink/index.jsp>

SNH aim to monitor sites on a regular basis. The information contained in the Table 1.2 contains the most up to date information available.

Table 1.2: Condition of European Designated sites

Name	Designation	Site Condition
Burrow Head	SAC	Unfavourable Declining: Great Crested Newts
Carsegowan Moss	SAC	Unfavourable No Change: Active raised bog Degraded raised bog
Flow of Dergoals	SAC	Favourable Maintained: Blanket bog Depressions on peat substrates
Galloway Oakwoods	SAC	Unfavourable Declining: Woodland
Kilhern Moss	SAC	Favourable Maintained: Blanket bog Depressions on peat substrates
Kirkcowan Flow	SAC	Favourable Maintained: Depressions on Peat substrates Unfavourable Declining: Blanket Bog
Luce Bay and Sands	SAC	Unfavourable Declining: Coastal dune heathland Great crested newts Shifting dunes Shifting dunes with marram Unfavourable No Change: Dune grassland Unknown: Shallow inlets and bays Intertidal mudflats and sandflats Reefs Shallow inlets and bays

Name	Designation	Site Condition
Merrick Kells	SAC	<p>Favourably Maintained:</p> <ul style="list-style-type: none"> Acid peat-stained lakes and ponds Acidic scree Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels Plants in crevices on acid rocks Otter <p>Favourable Recovered:</p> <ul style="list-style-type: none"> Depressions on peat substrates Dry heaths <p>Unfavourable Recovering:</p> <ul style="list-style-type: none"> Blanket bog Wet heathland with cross-leaved heath <p>Unfavourable No Change:</p> <ul style="list-style-type: none"> Montane acid grasslands
Mochrum Lochs	SAC	<p>Unfavourable No Change:</p> <ul style="list-style-type: none"> Blanket bog Depressions on peat substrates
Moffat Hills	SAC	<p>Favourable Maintained:</p> <ul style="list-style-type: none"> Plants in crevices on acid rocks Tall herb communities <p>Unfavourable Declining:</p> <ul style="list-style-type: none"> Alpine and subalpine heaths Blanket bogs Dry heaths <p>Unfavourable No Change:</p> <ul style="list-style-type: none"> Plants in crevices on base-rich rocks Acidic scree Montane acid grasslands
Mull of Galloway	SAC	<p>Favourable Declining:</p> <ul style="list-style-type: none"> Vegetated sea cliffs
Raeburn Flow	SAC	<p>Favourable Declining:</p> <ul style="list-style-type: none"> Active raised bog <p>Unfavourable No Change:</p> <ul style="list-style-type: none"> Degraded raised bog

Name	Designation	Site Condition
River Bladnoch	SAC	Unfavourable Recovering: Atlantic salmon
Solway Firth	SAC	Favourable Maintained: Atlantic salt meadows Coastal shingle vegetation outside the reach of waves Glasswort and other annuals colonising mud and sand Subtidal sandbanks Unfavourable No Change: Dune grassland Unknown: Estuaries Intertidal Mudflats and sandflats Reefs Sea lamprey River lamprey
Solway Mosses North	SAC	Unfavourable Recovering: Active raised bog Degraded raised bog
Tynron Juniper Wood	SAC	Unfavourable Recovering: Juniper on heaths or calcareous grasslands
Upper Nithsdale Woods	SAC	Unfavourable Declining: Mixed woodland on base-rich soils associated with rocky slopes
Castle Loch, Lochmaben	SPA	Unfavourable No Change: Pink footed goose
Glen App and Galloway Moors	SPA	Favourable Maintained: Hen harrier
Langholm - Newcastleton Hills	SPA	Unfavourable Recovering: Hen harrier
Loch Ken and River Dee Marshes	SPA	Favourable Maintained: Greenland white-fronted goose Greylag goose

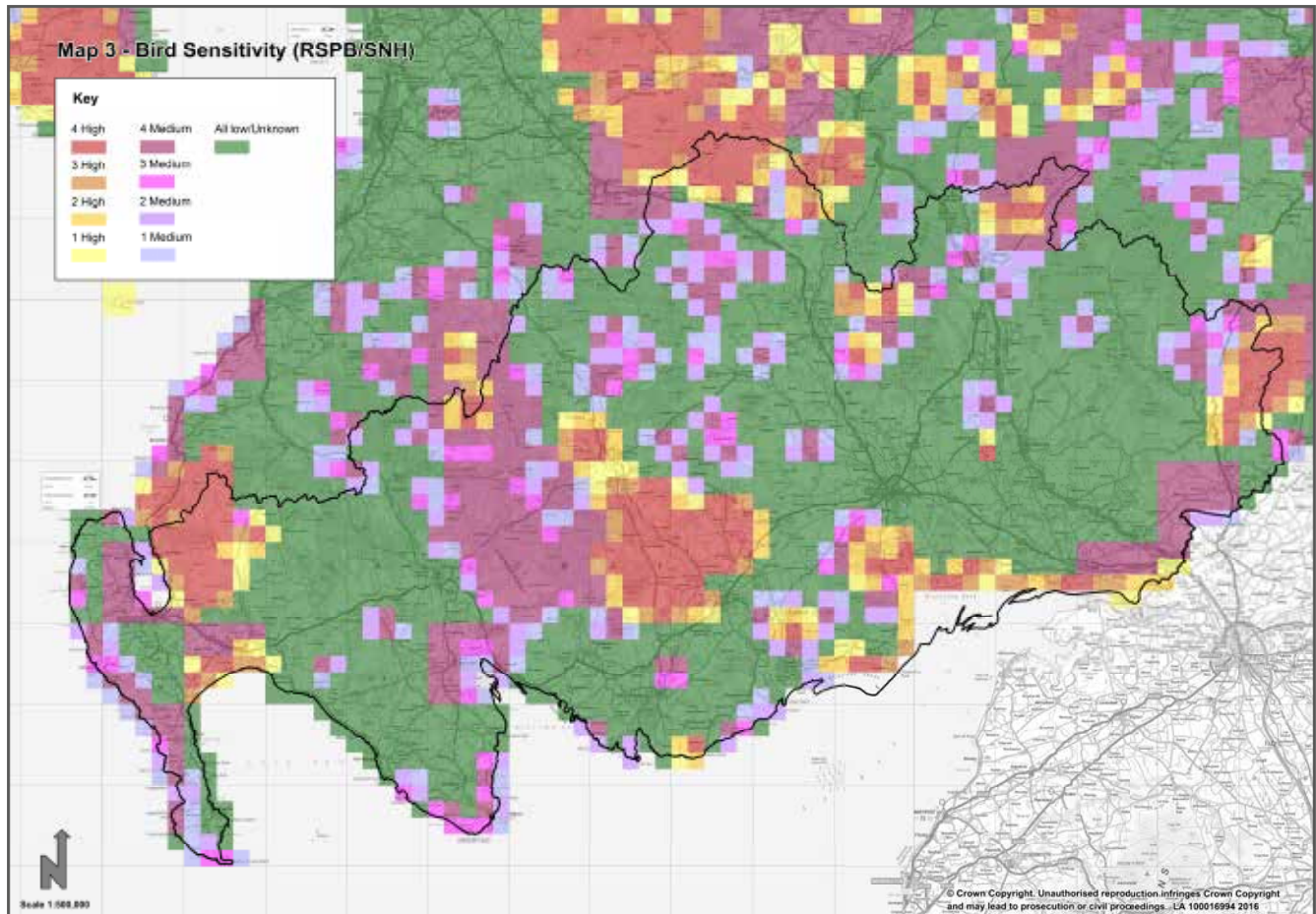
Name	Designation	Site Condition
Loch of Inch and Torrs Warren	SPA	Favourable Maintained: Greenland white-fronted goose Hen harrier
Muirkirk and North Lowther Uplands	SPA	Favourable Maintained: Short-eared owl Unfavourable Declining: Golden plover Hen harrier Unfavourable No Change: Merlin Peregrine
Upper Solway Flats and Marshes	SPA	Favourable Maintained: Svalbard barnacle goose Cormorant Great crested grebe Golden plover Lapwing Pink-footed goose Pintail Redshank Ringed plover Scaup Shelduck Waterfowl assemblage Favourable Declining: Dunlin Grey plover Knot Oystercatcher Favourable Recovered: Whooper swan Unfavourable Declining: Bar-tailed godwit Goldeneye Unfavourable No Change: Curlew Mallard

Name	Designation	Site Condition
Castle Loch, Lochmaben	Ramsar	Unfavourable No Change: Pink-footed goose
Loch Ken and River Dee Marshes	Ramsar	Favourable Maintained: Greenland white-fronted goose Greylag goose
Loch of Inch and Torrs Warren	Ramsar	Favourable Maintained: Greenland white-fronted goose Unfavourable Declining: Sand dune
Silver Flowe	Ramsar	Unfavourable Declining: Blanket bog
Upper Solway Flats and Marshes	Ramsar	Favourable Maintained: Knot Pink-footed Goose Pintail Oystercatcher Scaup Svalbard Barnacle Goose Unfavourable Declining: Bar-tailed Godwit Curlew

1.7 A number of species receive statutory protection from certain activities, whether or not they are found on designated sites. Details vary according to the species, but the highest level of protection is afforded to European Protected Species. In Dumfries and Galloway, this relates mainly to Otters, Bats (all species), Natterjack Toads and Great Crested Newts. Some species, due their

nature, move around over long or short distances, which can make their presence difficult to map accurately.

1.8 Map 3 indicates the RSPB/SNH bird sensitivity areas although this information relates to sensitivity to certain issues only such as windfarms/forestry.

Map 3: Bird Sensitivity

1.9 Some habitats and species are prospering, others are in decline. The net overall situation is unclear, due to the lack of detailed monitoring information, but in common with the rest of Scotland, it is likely that biodiversity is in decline, though the rate of decline has slowed. Habitat loss has been the main reason for the decline in the past, but climate change may rise in significance in the future. Disturbance to species can also occur as a result of new development. Data in relation to notified species, habitats and geological features and their condition is available at www.snh.gov.uk/publications-data-and-research/our-changing-environment/scotlands-indicators/biodiversity-indicators/biodiversity-state-indicators-list/. However, it is difficult to discern an overall trend from this, but consensus is that biodiversity is still in decline in Scotland. Although the trend is not known in Dumfries and Galloway, it is likely to be similar.

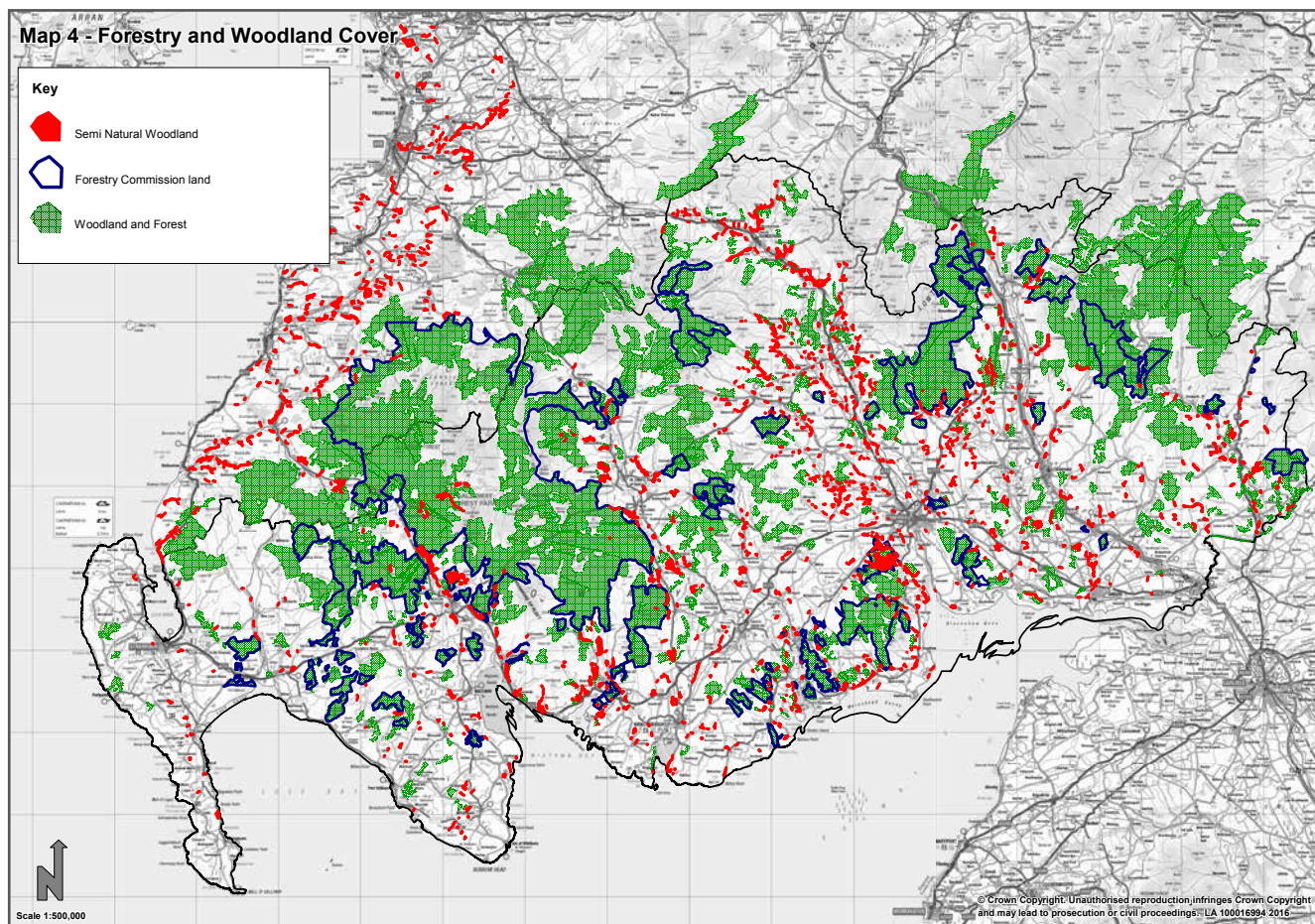
1.10 Invasive non-native species, such as Japanese Knotweed and North American Signal Crayfish, continue to spread despite legislative measures

and control projects. In certain circumstances and locations, such species can cause problems, but eradication is rarely possible or affordable once new species become established. Future management of these species will require a wide range of different measures.

Projects promoting biodiversity

1.11 Approximately 211,000 hectares in Dumfries and Galloway (approximately 31% of the region) is under forestry and woodland cover. Of this, native woodland covers 16,991ha, 9.4% of the total woodland area or 2.6% of the total land area of Dumfries and Galloway. This coverage is indicated on Map 4. Ancient woodland (land which has been continually wooded since 1750) is of greatest biodiversity benefit. There are 6,596ha of ancient woodland sites in the region, of which 46% is native woodland and 5% is nearly-native in composition (i.e. 40-50% native species in canopy). The remainder is planted with non-native trees, predominantly conifers, but much of it has potential for restoration to semi-natural ancient woodland.

Map 4: Forestry and Woodland Cover

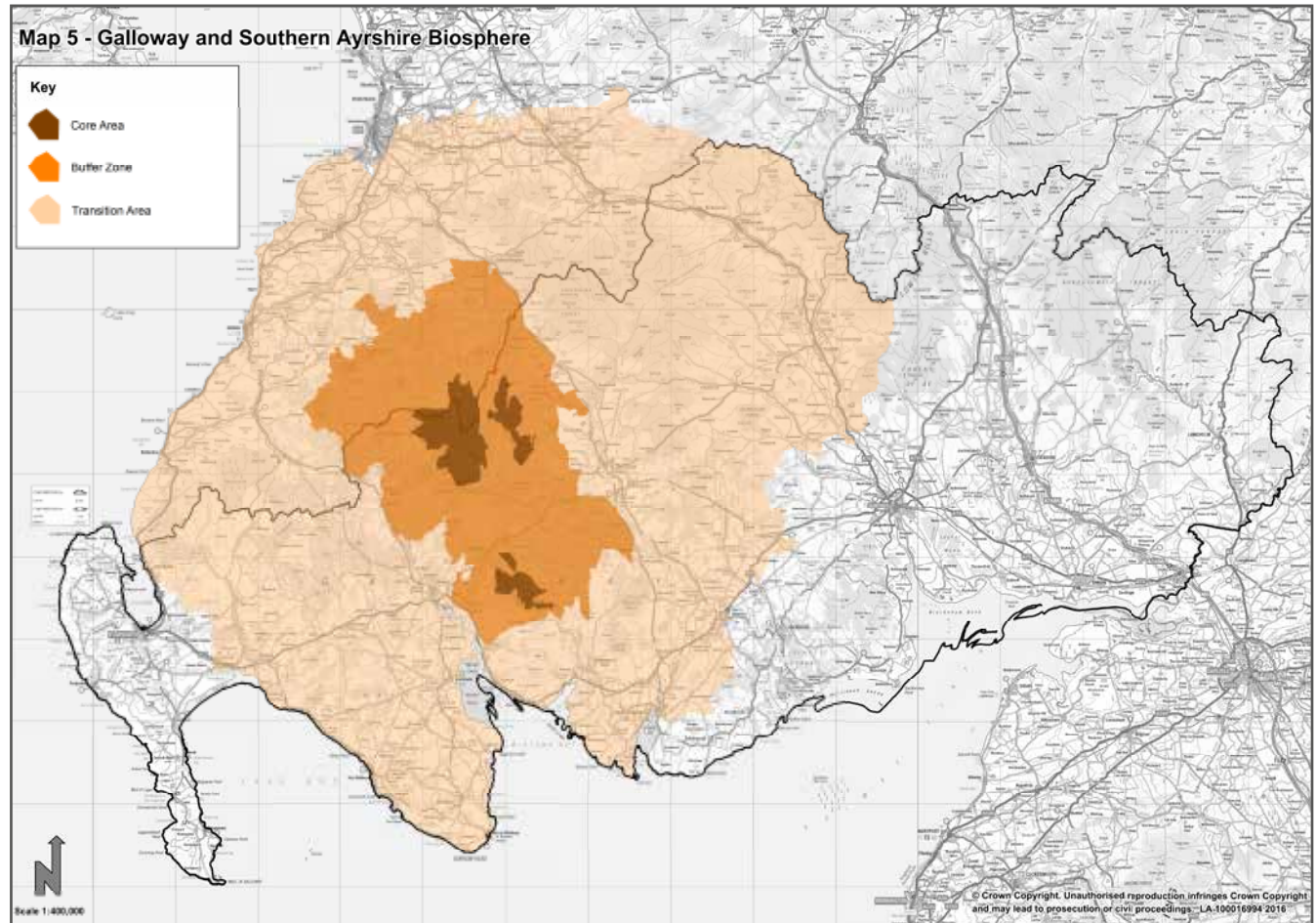


The Galloway and South Ayrshire Biosphere

1.12 The Galloway and South Ayrshire Biosphere Reserve was designated in 2012 by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) due to its unique combination of special landscapes and wildlife areas, rich with cultural heritage and communities that care about their environment and culture and want to develop it sustainably. The reserve comprises an area of 5268km² of land and is home to some 95,000 people although part of this

crosses into South Ayrshire. The Biosphere Reserve designation is a tool to promote the integrated and sustainable management of an area. The Galloway and Southern Ayrshire biosphere reserve is the first in Scotland and only the third in the UK and its boundaries is shown in Map 5.

Map 5: Galloway and Southern Ayrshire Biosphere



2. Population and Human Health

Key issues

- declining and older population with high life expectancy rates
- the number of households is increasing although household size is predicted to decrease
- over a quarter of the region's population live in Dumfries but overall, the region has a relatively low population density of 23 persons per km²
- overall, there are low levels of household income with a poorly performing labour market
- the region is diverse containing some of the most and least deprived areas of Scotland
- there is high reliance on car ownership in the rural parts of the region although 20% of households do not have access to private transport
- there is a wealth of recreational opportunities within the region

Topic Introduction

2.1 This topic relates to demographics and generic socio-economic issues. Dumfries and Galloway is the third largest region in Scotland with a land area that covers approximately 6,400 square kilometres.

The low overall population, together with its age structure and distribution, can give rise to particular issues in terms of health care provision, economic activity and deprivation.

SEA Objectives and Indicators

SEA Topic	SEA Objective	Indicators
Population and Human Health	To improve the quality of life, human health, well being and inclusion for all	Health and well being indicators (age expectancy, deprivation indexes, population figures, etc.)
	To increase the opportunities for access to, and enjoyment of, greenspaces and the wider landscape	Number of additional and improved access routes and cycle paths
	To encourage development within areas which are easily accessible by public transport as well as having good pedestrian and cycle linkages	Open space quantity and quality measured through the Open Space Audit

Data and Trends

Population and Age Structure

2.2 The National Records of Scotland (NRS) estimate the population of Dumfries and Galloway to have been 149,670 on 30 June 2015, a decrease of 0.2 per cent from 149,960 in 2014. The

population of the region accounts for 2.8 per cent of the total population of Scotland. Since 2009, the region's total population has declined overall while Scotland's population has risen over this period.

Table 2.1: Estimated population of Dumfries and Galloway and Scotland, 2009-2015

Population	Year						
	2009	2010	2011	2012	2013	2014	2015
Dumfries and Galloway	151,160	151,100	151,410	150,840	150,280	149,960	149,670
Scotland	5,231,900	5,262,200	5,299,900	5,313,600	5,327,700	5,347,600	5,373,000

	% Change in population	
	2014 - 2015	2009 - 2015
Dumfries and Galloway	-0.2%	-1.0%
Scotland	0.5%	2.7%

Source: National Records of Scotland (2015 based Population Estimate for Scotland and Council Areas)

2.3 The region's population is concentrated in small towns and villages with a large but thinly populated rural hinterland. There are only three settlements in the region with a population over 5000 people (Dumfries, Stranraer and Annan). The population of Dumfries (Regional Capital) accounted for 26.4% of the total population of the

region in 2012. Table 2.2 indicates the respective population in mid-2012 for Dumfries and the 16 District Centres identified in the LDP. These 17 settlements accounted for approximately 64.3% of the region's population. Overall, the region has a relatively low population density at 23 persons per square kilometre.

Table 2.2: Estimated population of Dumfries (RC) and District Centres, by age, 2012

District Centre	All Ages	Age Group		
		Under 16	16 to 64	65 and Over
Dumfries (Regional Capital)	39,850	6,880	25,268	7,702
Stranraer	10,510	1,871	6,353	2,286
Annan	8,920	1,607	5,427	1,886
Lockerbie	4,290	698	2,517	1,075
Dalbeattie	4,260	655	2,521	1,084
Castle Douglas	4,070	645	2,354	1,071
Newton Stewart	4,010	653	2,373	984
Gretna Border	3,445	479	1,789	772
Kirkcudbright	3,390	490	1,918	982
Moffat	2,550	380	1,469	701
Langholm	2,250	337	1,345	568
Lochmaben	2,100	354	1,283	463
Kirkconnel/Kelloholm	2,070	362	1,298	410
Sanquhar	1,980	337	1,170	473
Thornhill	1,610	232	853	525
Wigtown	900	119	522	259
Whithorn	790	128	479	183

Source: National Records of Scotland (2012 based Population Estimate for Localities)

2.4 Over the past decade, Dumfries and Galloway's population has been in a state of 'natural decline' with more deaths per year than births. This, along with improvements in mortality rates and the ageing of the 'baby boomers', has resulted in a generally older population shown in the rise of the 60+ age groups and the decline of the 0-15 year olds and the 30-44 year olds. The over 75 age group rose the most (18%).

2.5 Between 2014 and 2015, Dumfries and Galloway experienced a 2.3 per cent decrease in the number of births, dropping from 1,286 in 2014 to 1,256 in 2015. The number of births in Scotland fell by 2.9 per cent during the same period. Fertility in the region decreased from 54.2 births per 1,000 women aged 15 to 44 in 2014, to 53.7 in 2015. For Scotland as a whole, the general fertility rate decreased from 54.7 births per 1,000 women aged 15 to 44 in 2014, to 53.2 in 2015.

Table 2.3: Births in Dumfries and Galloway and Scotland, 2014 and 2015

	Births 2014	Births 2015	% change in total no. of births 2014-2015
Dumfries and Galloway	1,286	1,256	-2.3%
Scotland	56,725	55,098	-2.9%

Source: National Records of Scotland

2.6 The number of deaths in Dumfries and Galloway increased by 1.5%, from 1,883 in 2014 to 1,912 in 2015 while the number of deaths in

Scotland increased by 6.2%, from 54,239 in 2014 to 57,579 in 2015.

Table 2.4: Deaths in Dumfries and Galloway and Scotland, 2014 and 2015

	Deaths 2014	Deaths 2015	% change in total no. of deaths 2014-2015
Dumfries and Galloway	1,883	1,912	1.5%
Scotland	54,239	57,579	6.2%

Source: National Records of Scotland

2.7 Over the period 2012 to 2014, the overall death rate was lower for males than females. Compared

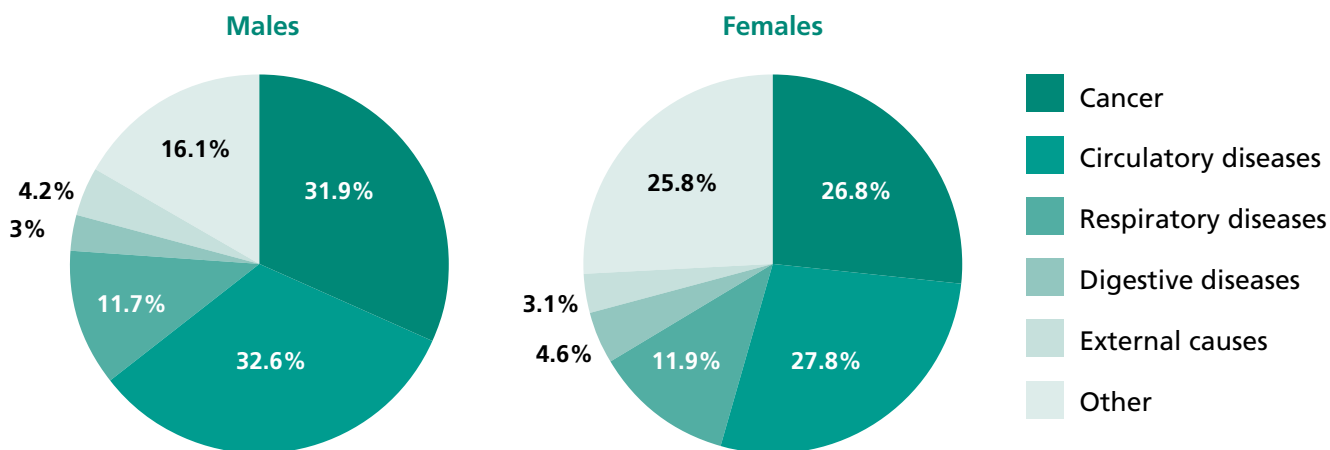
to Scotland over the period 2012 to 2014, Dumfries and Galloway had a higher death rate.

Table 2.5: Deaths and age specific death rates by age group, the combined years 2013-2015

Age group	Deaths in Dumfries and Galloway	Deaths in Scotland	Age specific death rate per 1,000 people, Dumfries and Galloway			Age specific death rate per 1,000 people, Scotland		
			Male	Female	All Persons	Male	Female	All Persons
0	15	568	3.2	3.9	3.5	3.4	3.0	3.2
1-14	5	234	0.1	0.0	0.1	0.1	0.1	0.1
15-29	45	1,391	0.9	0.5	0.7	0.7	0.3	0.5
30-44	94	4,479	1.7	0.9	1.3	1.9	1.0	1.4
45-64	597	23,579	5.0	3.8	4.4	6.5	4.3	5.4
65+	4,914	136,267	49.8	46.2	47.9	51.6	47.3	49.2
All ages	5,670	166,518	12.6	12.5	12.5	10.4	10.5	10.4

Source: National Records of Scotland

Fig.2a: Cause of death in Dumfries and Galloway 2014



Source: National Records of Scotland

2.8 Life expectancy rates for both men and women are greater than the Scottish average. Female life expectancy at birth (81.3 years) is greater than male life expectancy (78.1 years). Male life expectancy at birth in Dumfries and Galloway is improving more rapidly than female life expectancy. In 2012

- 2014, the lowest proportion of adults meeting the physical activity guidelines was observed in Dumfries & Galloway (59%), while the highest was in Lothian (66%). However, neither of these was significantly different to the Scotland figure of 63%.

Table 2.6: Life Expectancy for Dumfries and Galloway and Scotland, 2003-2005 and 2013-2015

Dumfries and Galloway	Life expectancy at birth		Life expectancy at 65	
	Male	Female	Male	Female
2013-2015	78.1	81.3	17.8	19.8
2003-2005	75.7	79.8	-	-
% Change between 2003-2005 and 2013-2015	3.3%	1.9%	-	-
Scotland	Life expectancy at birth		Life expectancy at 65	
	Male	Female	Male	Female
2013-2015	77.1	81.1	17.3	19.7
2003-2005	74.2	79.0	-	-
% Change between 2003-2005 and 2013-2015	3.9%	2.7%	-	-

Source: National Records of Scotland

2.9 There does still seem to be a trend of younger people moving away from the region. Overall, in and out migration are at similar levels resulting in only a marginal net gain between 2013 and 2015. On average, in 2013-2015, there was a net inflow of 217 people into Dumfries and Galloway per year,

meaning that more people entered the region (3,984 per year) than left (3,767 per year). The 16 to 29 year olds age group accounted for the largest group of in-migrants with the largest of out-migrants also being the 16 to 29 year olds.

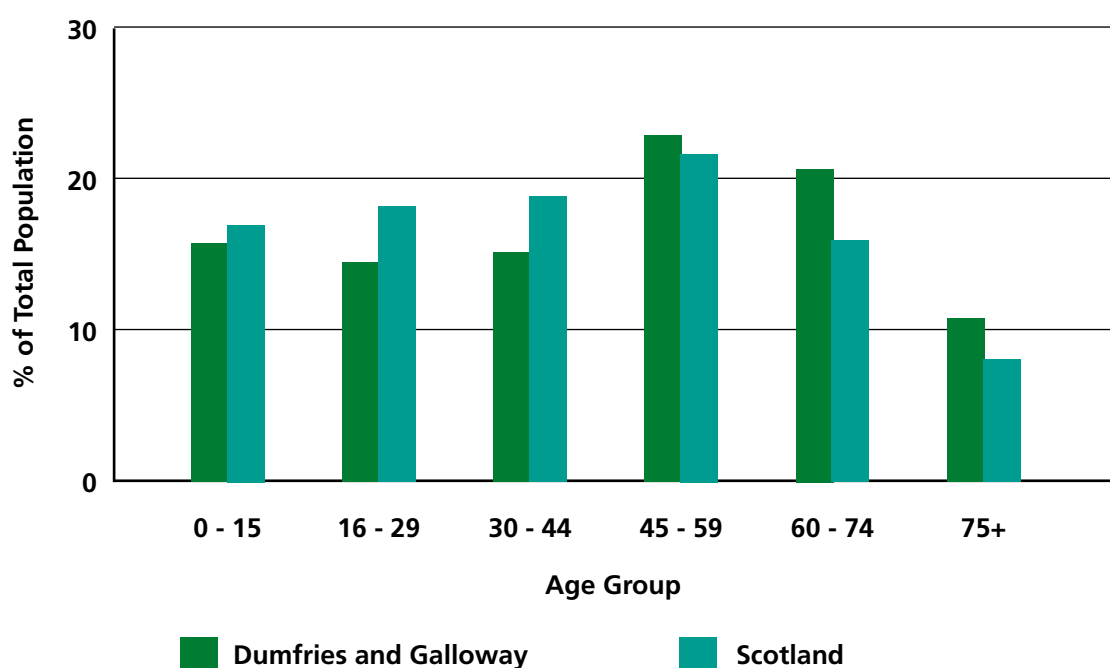
Table 2.5: Average migration in and out of Dumfries and Galloway 2013-2015

Age Group	In	Out	Net
0-15	581	498	83
16-29	1,135	1,431	-296
30-44	811	709	102
45-64	1,000	697	303
65+	457	432	25
All ages	3,984	3,767	217

Source: National Records of Scotland (Population Estimates for Council Areas 2013-2015)

2.10 Fig. 2b indicates the age distribution of the region's population and that, in comparison to Scotland, the population has a higher proportion of the older age groups and a smaller proportion of the younger age groups.

Fig.2b: Estimated population of Dumfries and Galloway and Scotland, by age group, 2015

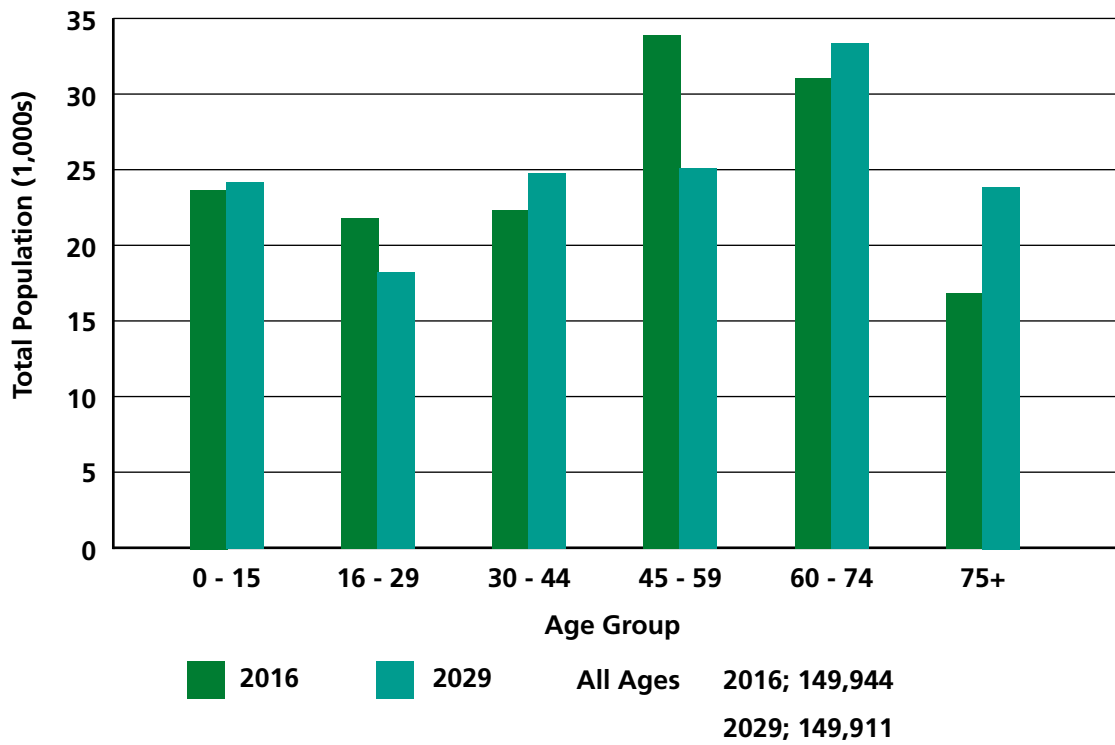


Source: National Records of Scotland (2015 based Population Estimate for Scotland and Council Areas)

2.11 By 2029, the population of Dumfries and Galloway is projected to be 149,911, a decrease of 33 compared to the population in 2016. The population of Scotland is projected to increase by 7.5% over the Plan period. The age group that

is projected to increase the most in size in the region is the 75+ age group, which is the same as for Scotland as a whole. The population aged 16-29 in Dumfries and Galloway is projected to decline by 16.3% over the Plan period.

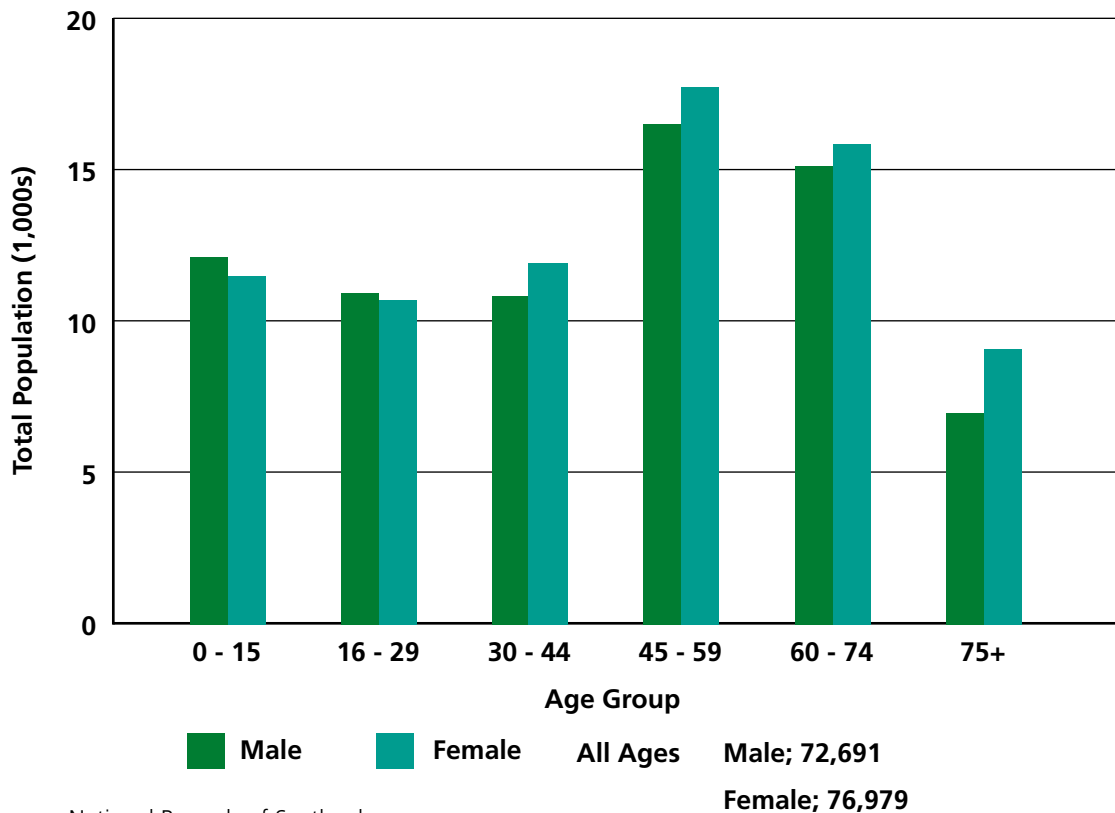
Fig.2c: Projected population by age group, in Dumfries and Galloway, 2016-2029



Source: National Records of Scotland (2012 based Population Projections for Council Areas (High Migration Variant Projection))

2.12 There were more females (51.4%) than males (48.6%) in Dumfries and Galloway in mid-2015 which was the case for all Council areas across Scotland other than the Shetland Islands.

Fig.2d: Estimated population of Dumfries and Galloway, by age and sex, 2015



Source: National Records of Scotland

2.13 The number of households in the region is marginally increasing whilst the average household size is projected to decrease. The 2015 estimate of the number of households is 68,999. This is a 0.3% increase in the 2014 figure of 68,818, compared to

a 0.6% in Scotland as a whole. The proportion of these households receiving a single adult Council Tax discount is 34.8% and for Scotland this figure is 37.4%.

Table 2.8: Household estimates for Dumfries and Galloway and Scotland, 2009-2015

	Year						
	2009	2010	2011	2012	2013	2014	2015
Dumfries and Galloway	67,662	67,845	68,058	68,364	68,682	68,818	68,999
Scotland	2,351,780	2,364,850	2,376,424	2,387,211	2,401,788	2,418,335	2,433,956

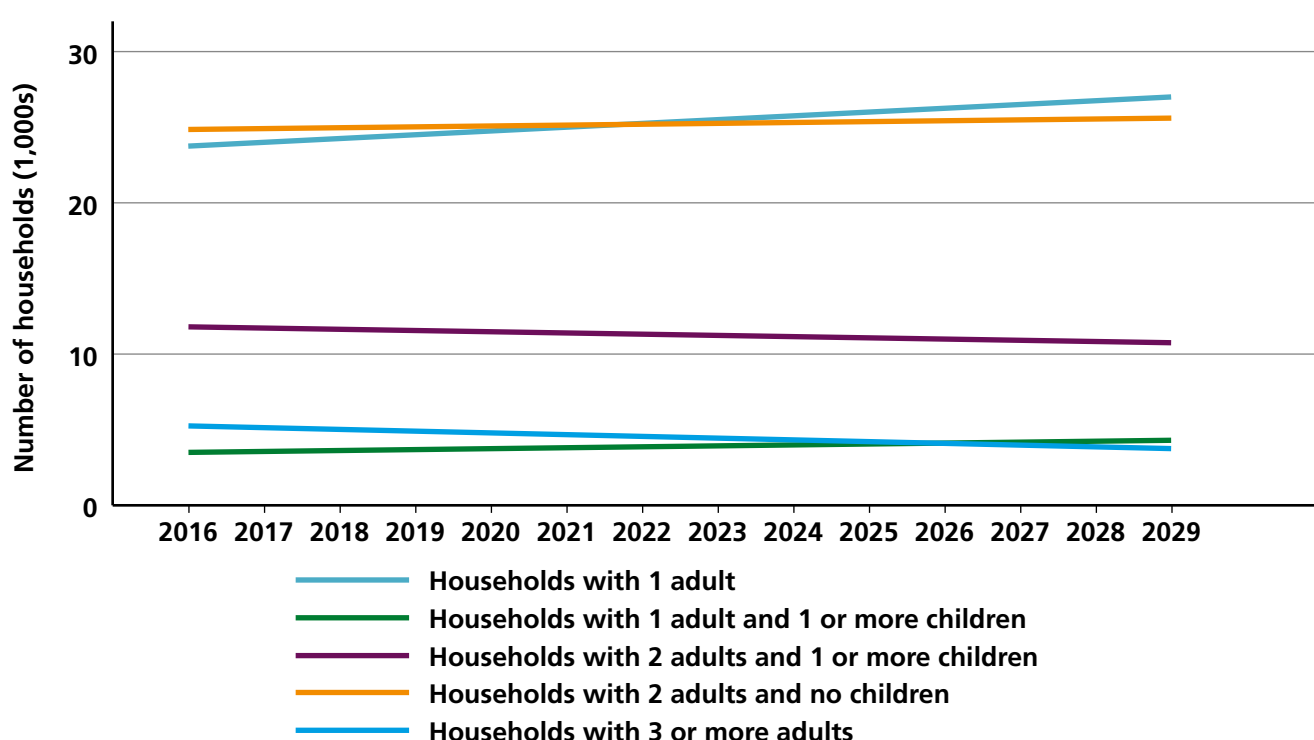
	% Change in households	
	2013 - 2015	2009 - 2015
Dumfries and Galloway	0.3%	2.0%
Scotland	0.6%	3.5%

Source: National Records of Scotland

2.14 By 2029, the number of households in Dumfries & Galloway is projected to be 71,785, an increase of 3.5% compared to the number of households in 2016. In Scotland as a whole, the projected number of households is set to increase by 10.9% over the Plan period. In Dumfries and Galloway, the number of lone adult households is projected to increase by 13.5% (3,235 households),

the number of households with 3 or more adults with no children is projected to fall by 23.6% (1,217 households) and the number of households of 2 or more adults with children is projected to decrease by 8.4% (1,001 households) over the Plan period. Overall, the average household size is projected to decrease from 2.13 in 2016 to 2.05 in 2029.

Fig 2e: Projected number of households by household type, in Dumfries and Galloway 2016-2029

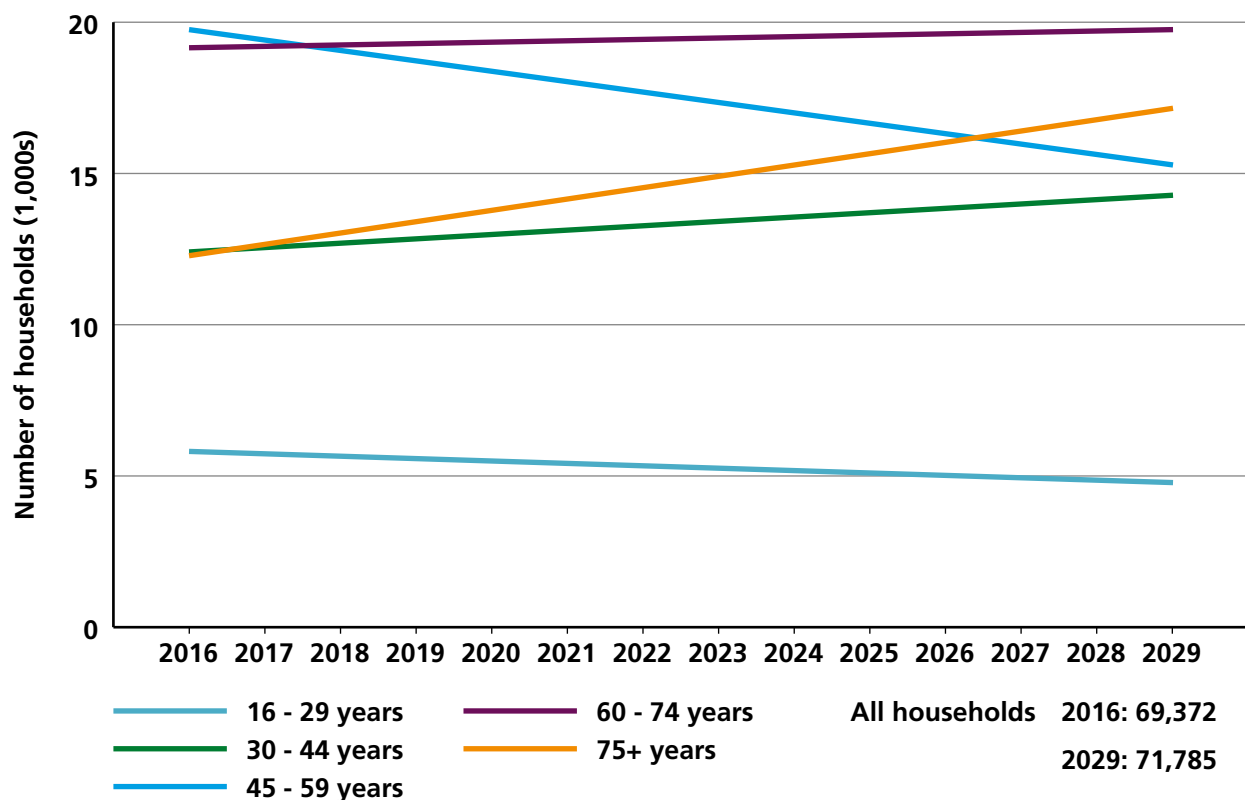


Source: National Records of Scotland (2012 based Household Projections for Council Areas (High Migration Variant))

2.15 In Dumfries & Galloway, households headed by the 75+ age group are projected to increase in number by 41.9% (5,110 households). In Scotland as a whole, the projected number of households headed by the 75+ age group is set to increase

by 41.4% over the same period. In Dumfries and Galloway households headed by the 45-59 year olds are projected to decrease in number by 22.9% (4,524 households) between 2016 and 2029.

Fig 2f: Projected number of households by age of head of household in Dumfries and Galloway 2016-2029



Source: National Records of Scotland (2012 based Household Projections for Council Areas (High Migration Variant))

2.16 The 2015 estimate of the number of dwellings in Dumfries and Galloway is 74,190. This is an increase of 0.4% from 2014 and compares to a 0.7% increase across Scotland as a whole. With regards to the dwellings in the region, 3.2% are vacant and 3.0% are second homes.

The proportions of dwellings in Scotland which are vacant and second homes are 3.1% and 1.1% respectively. The pie chart below indicates the split between the different types of dwellings within the region.

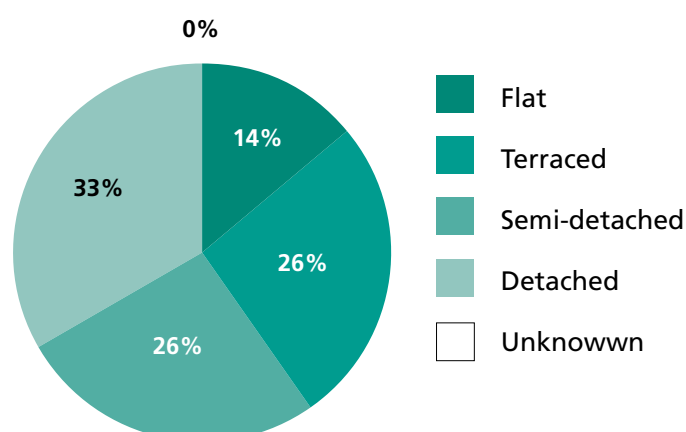
Table 2.9: Number of dwellings in Dumfries and Galloway and Scotland, 2009-2015

Dwellings	Year						
	2009	2010	2011	2012	2013	2014	2015
Dumfries and Galloway	72,106	72,421	72,871	73,224	73,555	73,895	74,190
Scotland	2,476,157	2,488,496	2,500,849	2,515,042	2,526,870	2,540,561	2,557,582

Dwellings	% Change in dwellings	
	2014 - 2015	2009 - 2015
Dumfries and Galloway	0.4%	2.9%
Scotland	0.7%	3.3%

Source: National Records of Scotland

Fig.2g: Types of dwellings in Dumfries and Galloway 2014



Source: National Records of Scotland

Economic Activity

2.17 The Dumfries and Galloway Regional Economic Strategy 2016 - 2020 includes key information in relation to the labour market. The strategy also identifies the following challenges:

- Gross Value Added (GVA) per haed in Dumfries and Galloway is £15,626, well below the Scottish average of £20,571
- there is a high and growing proportion of part time jobs
- there are high unemployment rates, particularly in relation to youth unemployment
- relatively few of those of working age have a high level of qualification or the skill levels required by employers
- full time workers in the region receive the lowest average weekly wage in Scotland

2.18 Overall there are low levels of household income in the region and a high level of households in relative poverty. The region has a poorly performing labour market when looking at employment, unemployment and wages relative to the Scottish average and to rural comparator regions with similar economic issues.

- 8% of economically active adults (n=5,500) are unemployed a rate has doubled between 2008 and 2012.
- 68% (n=60,300) of people are in employment but of those only 66% are in full-time employment and there is evidence of significant underemployment.

- Youth unemployment (n=700) i.e. those aged 16-24 years fell from a peak of 1,220 in February 2012 but the rate remains consistently higher than for other age groups, for comparator regions and for Scotland as a whole.
- The public sector accounts for 27% of all jobs. Agriculture, retail, specific types of manufacturing, accommodation and residential care are all major sectors that are over-represented while professional, scientific and technical services; business administration and support; finance and insurance; and, information and communication are significantly under-represented.

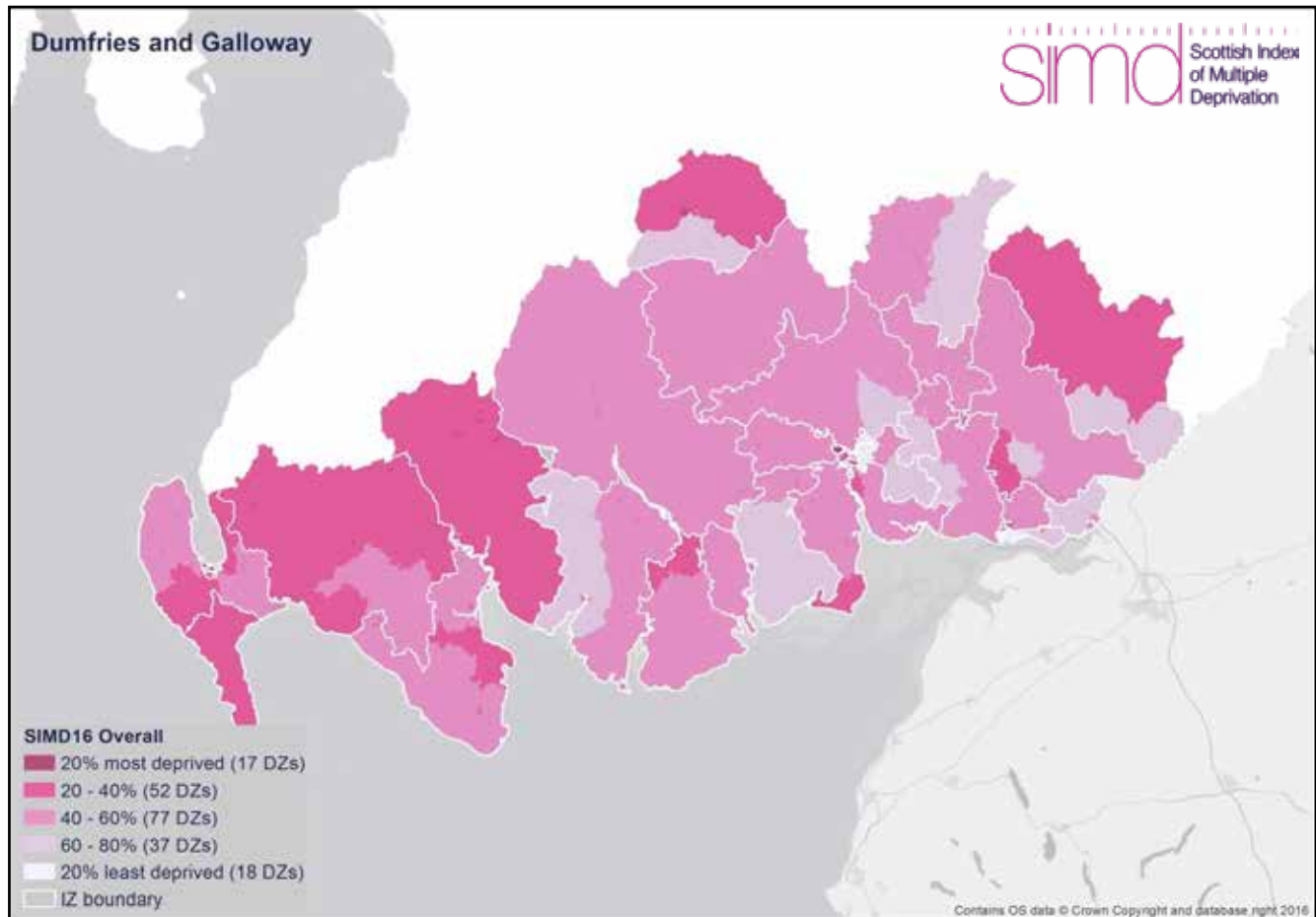
2.19 There are fewer people with high level qualifications than the Scottish average and a lower proportion of graduates in the workforce (20% compared to the Scottish average of 30%). Over 12% of people in the region have no qualifications which is above the Scottish average of 11%. However, only a very small number of pupils now leave school with no qualifications and attainment at the end of S4 is better than in comparator regions (in terms of Standard Grades). This advantage is lost by S5 and S6 (in terms of Highers). A higher than average proportion of school leavers enter Further Education but fewer than average enter Higher Education with 87% of pupils leaving school in 2011/12 going on to positive destinations. 20% of employees receive work-related training from their employers, considerably below the Scottish average of 30%.

Deprivation

2.20 The region is very diverse, containing some of the most deprived and least deprived areas in Scotland. The most deprived areas are located in Dumfries, Stranraer and Upper Nithsdale. The 2016 Scottish Index of Multiple Deprivation (SIMD) identified 17 of Dumfries and Galloway's

201 datazones as being within the top 20% most deprived datazones in Scotland, compared to 9 in 2004, 11 in both 2006 and 2009 and 13 in 2012. However it should be noted that the number of datazones increased by 8 in 2016 and therefore the relative data is not entirely compatible.

Map 6: Levels of deprivation in Dumfries and Galloway in SIMD 2016 by quintile

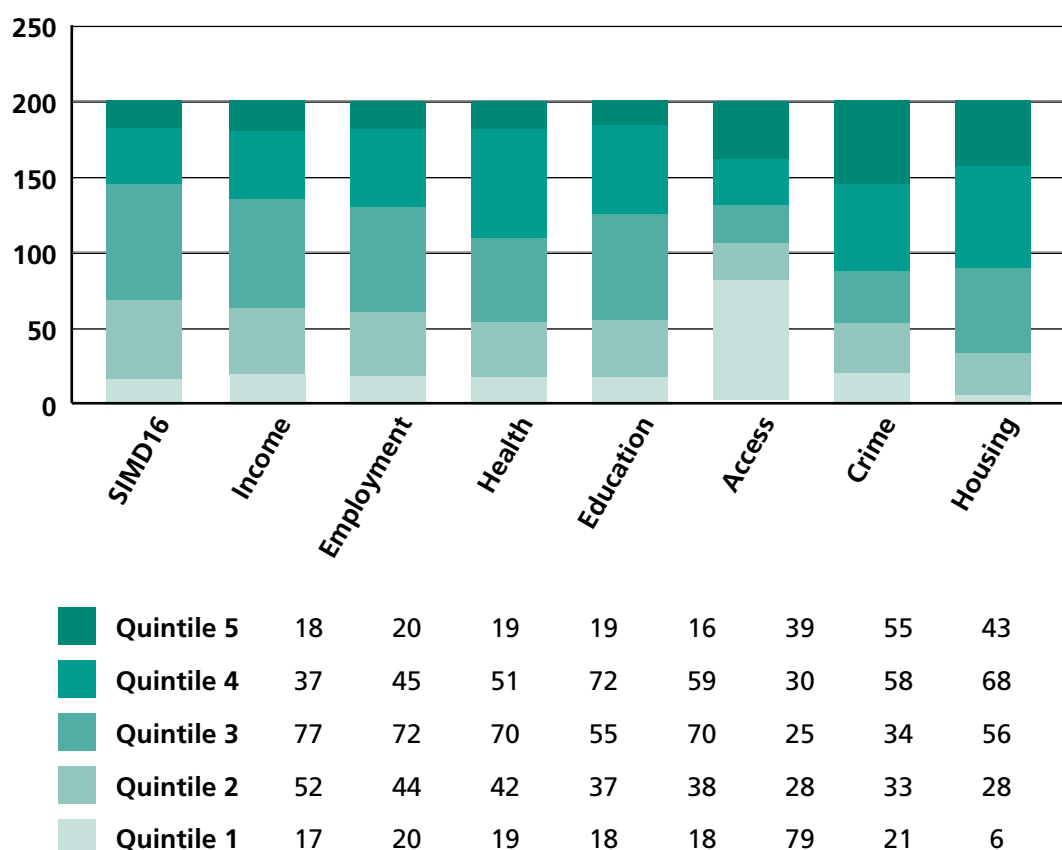


Source: SIMD 2016 <http://www.gov.scot/Topics/Statistics/SIMD/analysis/councils>

2.21 The SIMD 2016 deprivation information is provided for a number of different domains such as Income, Employment, Health, Education, Access, Crime and Housing and is provided by datazones in quintiles with the most deprived being in

Quintile 1 and the least deprived being Quintile 5. Fig 2h below provides a summary of the quintile information for the Dumfries and Galloway region by each domain.

Fig. 2h: Datazone distribution of quintiles by SIMD domain



Source: SIMD 2016 <http://www.gov.scot/Topics/Statistics/SIMD/analysis/councils>

2.22 Access to facilities is not always easy, particularly within the rural areas, which has not been helped with the loss of a number of rural services such as shops/post offices and public houses. This is shown in the high number (79) of datazones in the 20% most deprived quintiles in Scotland in relation to access to facilities taking into account travel time and access by public transport.

2.23 Disadvantaged communities are more vulnerable to climate-related hazards and the associated effects on well-being from the impacts of climate change.¹ A warming climate may provide more opportunity to be outdoors and enjoy a healthy and active lifestyle, while reducing mortality in winter. However, it could affect patterns of disease and other health issues. Climate change and associated extreme weather may disrupt the lives of individuals and communities, limiting access to vital services and impacting on people’s physical and mental health.

Active Travel

2.24 Active travel involves journeys made through such means as walking, cycling, jogging, etc. and is a means of increasing physical activity whilst at the same time reducing car use. Although Dumfries and Galloway is a largely rural area, 51.5% of all journeys are less than 5km and 28.7% of these journeys is less than 1km, which is more than in Edinburgh or Glasgow City. Of all people aged 16 to 74 in employment in Dumfries and Galloway, 16% work at, or from, home. 21% live less than 2km from their workplace, with a further 15% living 2-5km away.

2.25 Public transport options within the region tend to be limited, particularly in the more rural areas, resulting in continued reliance on car ownership. However, improvements are continually being made in the provision of public transport and network of cycleways and footpaths where possible and it is an integral part of the planning process for new development.

1. Lindley, S., O’Neill, J., Kandeh, J., Lawson, N., Christian, R. and O’Neill, M. (2011) Climate Change, Justice and Vulnerability Joseph Rowntree Foundation Available at: <https://www.jrf.org.uk/report/climate-change-justice-and-vulnerability>

2.26 23% of households do not have access to private transport. Improving the transport infrastructure is a priority if the region is to maximise the benefits of connections with other centres of economic activity.

2.27 Some limited information is available in relation to walking and cycling activity levels from national sources which has assisted the Council in

producing baseline information contained in the Active Travel Strategy (2015) to help assess the progress in overall take up rates (shown in Table 2.10). The Strategy sets out targets for walking and cycling based around travel to work and as a regular means of transport to enable monitoring of progress to take place.

Table 2.10: Active Travel Baseline Information and Targets

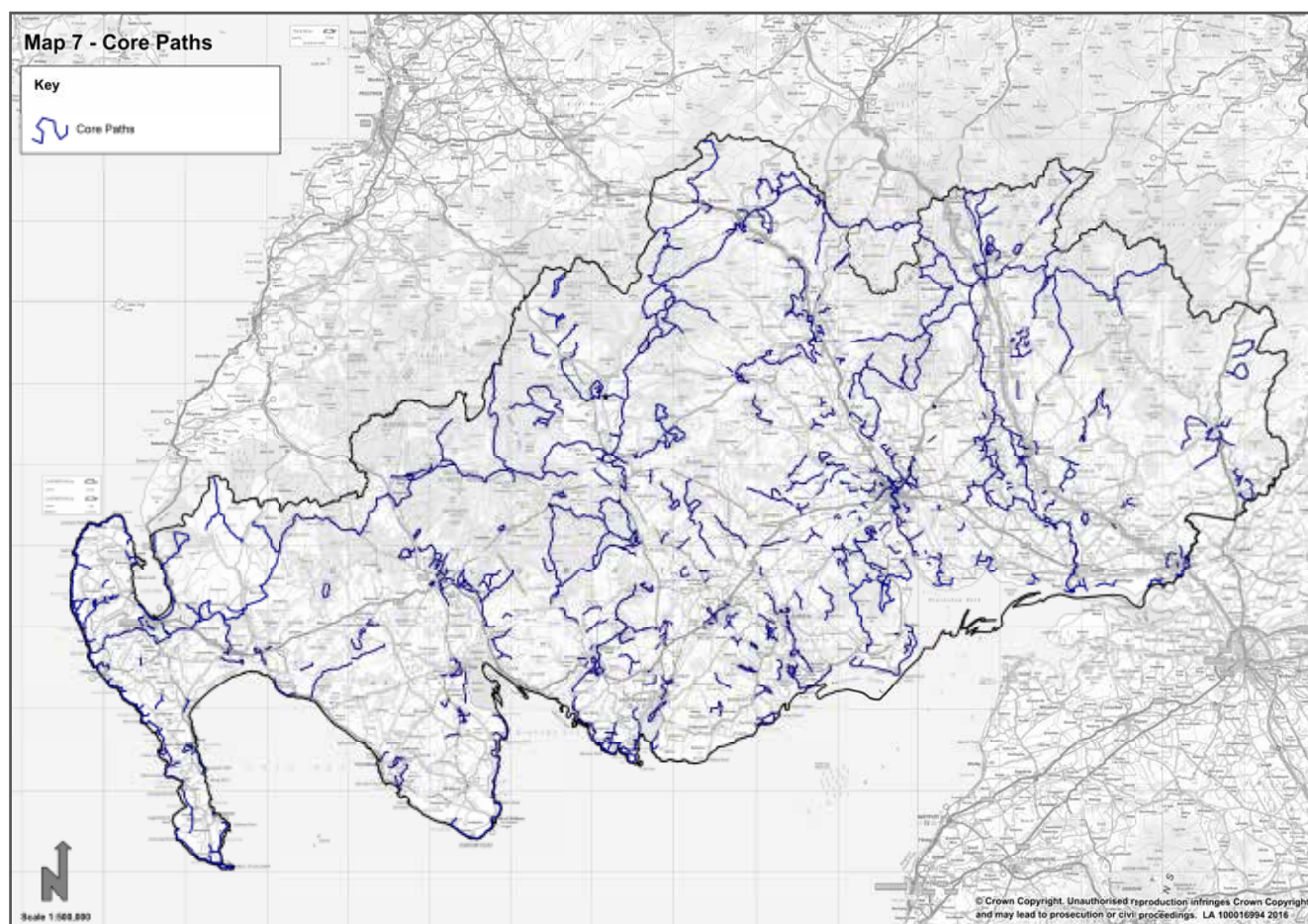
Sector	Baseline	Target
Travel to Work		
% of people cycling to work	4.5%	6%
% of people walking to work	18.5%	20%
General Travel		
% of people regularly cycling (daily) as a means of transport by 2017	10.8%	12%
% of people regularly walking (last 3-5 days) as a means of travel by 2017	25.2%	27%

Source: Active Travel Strategy

2.28 The Council has adopted a core path network which is shown in Map 7 and it extends to approximately 2,000km of paths suitable for non-motorised access. There are a further 641 recorded claimed, alleged or vindicated rights of way (covering some 1,790km) and other routes recorded

on paths record databases. The region also has a number of Scotland's Great Trails (SGT's) including the western section of the Southern Upland Way (136km), Annandale Way (85km) and The Mull of Galloway Trail (60km).

Map 7: Core Paths



2.29 The Dumfries and Galloway Core Paths Plan was adopted in 2013 and improvements have been made to signage, access infrastructure, surfacing and drainage where required, to ensure that all core paths are accessible. With the forest parks and other recreational outlets there is generally a wide range of outdoor leisure and recreational facilities within the region, many at limited costs to participate and with reasonable accessibility. A review of the core paths plan will be required to ensure strategic linkages and connections are in place to form a fully connected network throughout the region. There are a number of initiatives planned to build on the core path network to improve access to the natural heritage which include the South West Scotland Coastal Path. The first phase planned is the section around the Rhins of Galloway to create a continuous 105km coastal path. The region has potentially a vast network of green spaces but there is much work still to be done to form this into a coherent network building on the Core Path Network and the open space audit.

Open Space

2.30 Dumfries and Galloway covers a very large geographical area, typified by large numbers of small dispersed settlements, often displaying diverse characteristics, located within open countryside. This poses challenges for identifying specific open space areas as, in many cases, sites can be very large with no clear distinction between publicly usable and less accessible space (for example, forest parks may contain a series of paths but the entire forest itself is not necessarily usable).

2.31 Dumfries and Galloway has a wealth of open space within and around its towns and villages ranging from formal parks (such as Dock Park in Dumfries and Station Park, Moffat) to a vast network of green corridors and natural and semi-natural spaces, including forest walks and bike trails on the edge of settlements like Dalbeattie. With the forest parks and other recreational facilities, there is generally a wide range of outdoor leisure and recreational facilities within the region, many at limited costs to participate and with reasonable accessibility.

2.32 The Dumfries and Galloway Open Space Audit was carried out between 2010 and 2013 and was adopted in 2014. It identifies open space sites within 500m of the boundaries of each of the 48 settlements in the region that are classed as Regional, District or Local Centres in the Local Development Plan (LDP). The Audit provides the essential baseline understanding of open space

assets across Dumfries and Galloway Council's area. The Audit was carried out between 2010 and 2013 on a settlement-by-settlement basis and included over 1000 sites. However, sites that were located some distance from the settlements (such as the forest parks) have not been included. Table 2.11 summarises the results for each settlement.

Table 2.11: Summary of the Open Space Audit results for each settlement

Settlement	Hectares per 1000 population	Significant Accessibility issues?	Settlement	Hectares per 1000 population	Significant Accessibility issues?
Annan	3.8		Kirkcowan	5	
Auchencairn	9.84		Kirkcudbright	13.85	
Braehead / Kirkinner	1.89	Yes	Langholm	16.55	
Canonbie	8.38		Leswalt	51.79	
Carsphairn	1.58	Yes	Lochmaben	3.89	
Castle Douglas	4.97		Lockerbie	25.2	
Closeburn	3.8		Moffat	25.06	
Creetown	6.72		Moniaive	19.77	
Crossmichael	23.79		New Abbey	5.50	
Dalbeattie	53.91		New Galloway	7.84	
Drummore	4.61		Newton Stewart	18.85	
Dumfries	9.72		Palnackie	0.12	Yes
Eaglesfield	6.05	Yes	Penpont	14.14	
Eastriggs	1.69		Port William	12.46	
Ecclefechan	4.01	Yes	Portpatrick	5.82	
Garlieston	2.76		Sandhead	19.71	
Gatehouse of Fleet	78.55		Sanquhar	6.06	
Glencaple	14.97		Springholm	5.06	
Glenluce	17.1		St John's Town of Dalry	1.5	
Gretna	2.92		Stranraer	6.72	
Holywood	1.27	Yes	Thornhill	22.16	
Johnstonebridge	12.28		Twynholm	6.67	
Kirkcolm	1.9		Whithorn	4.27	
Kirkconnel	40.86		Wigtown	5.34	

2.33 The Audit shows that many towns and villages have good networks of open space and have large amounts of usable space within easy reach of residents. For others, however, the Audit shows that there is very little provision of usable open space or there are large parts of the settlement that are not within the accessibility standard of a five minute walk to usable space over 0.2 hectares. In many areas, the biggest open space challenge relates not to quantity but to the quality of spaces.

2.34 The Open Space Strategy 2014 sets out open space standards in relation to quantity, accessibility and quality as follows:

- The Quantity Standard sets a 'target' amount of open space that would be expected in settlements within Dumfries and Galloway and is expressed in terms of hectares of open space per 1000 people. In Dumfries and Galloway, the standard has been identified as 6 hectares of publicly usable open space per 1000 population
- The Accessibility Standard has been set as a target of every household in the 48 settlements included in the Audit being a 5 minute walk from a publicly usable open space site of at least 0.2 hectares in size which is open for all. Generally, in an urban design context, a 5 minute walk is considered to equate to a distance of 400 metres "door to space".
- The Quality Standard ensures that any new spaces created in an area should be of an acceptable quality and have management in place to ensure that this quality is maintained. Equally, management of existing open spaces needs to target quality shortfalls.

(further information is included within the Open Space Strategy 2014)

2.35 Green networks are a strategic linked system of existing and proposed green spaces within and around settlements (including open space found within settlements), linking out into the wider countryside. Areas of open space within the built environment can form part of these wider green networks and contribute to their functions so new development should wherever possible create opportunities to contribute to enhancing the connectivity of the green network. However, there is not currently a coherent network of green corridors but it has been highlighted as an issue going forward.

3. Soil

Key issues

- only a small proportion of land is considered to be prime agricultural land
- the region contains large areas of peatland
- there are a number of sites with potential contaminated land issues that may require mitigation
- there are issues of soil erosion particularly through flood events and in coastal areas

Topic Introduction

3.1 This topic is concerned with soil and geology (and in particular, agricultural land, and important geological sites), as well as contaminated land and erosion.

SEA Objectives and Indicators

SEA Topic	SEA Objective	Indicators
Soil	To safeguard the soil quality, geodiversity and improve contaminated land	Changes in soil quality
	To reduce negative effects on peat and carbon rich soil	Maintain diversity of geology, natural landforms and processes
	To reduce and minimise soil and coastal erosion	

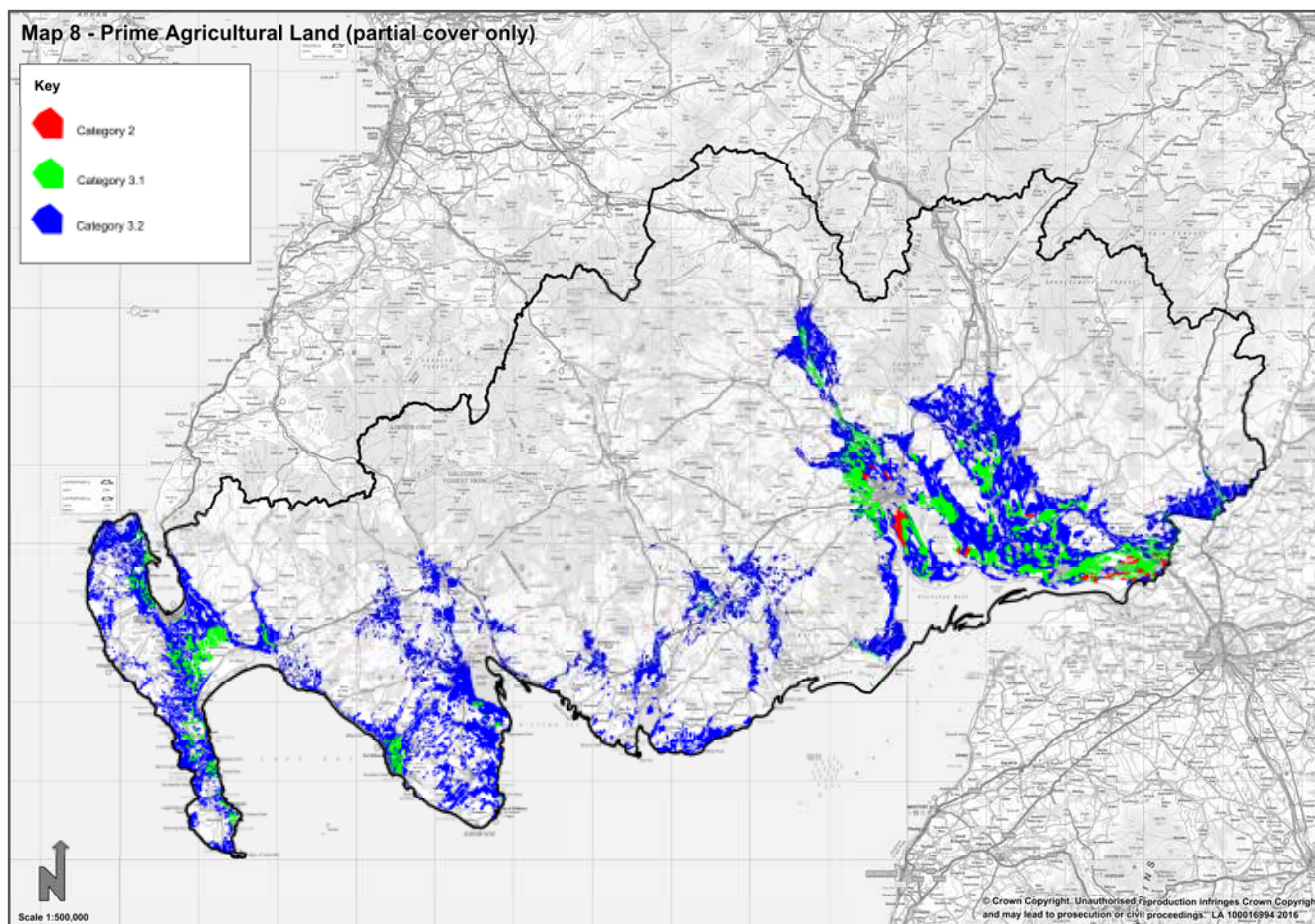
Data and Trends

Soil Classification

3.2 There is only a very small proportion of land in the region that is considered to be prime agricultural land (taken in the region to be James Hutton Institute land capability for agriculture 1, 2, 3.1 and 3.2) mainly located in the Rhins, the Machars and around Dumfries, Annan and Lochmaben. It is evident that much of this land is in the vicinity of main centres of population (further information is available at <http://www.soils-scotland.gov.uk/data/lca50k>). Given the importance of agriculture nationally and as part of the local economy, there is a need to protect the limited

land resource of better quality soil and ensure careful management of changes of land use that may impact on it. Therefore, the LDP also provides protection for land classified as 3.2.

3.3 The region also contains large areas of peatland, mostly, though not exclusively, in upland areas. Many of these are of interest in terms of nature conservation. Along with carbon rich soils, peat areas are now also generally valued as repositories of CO₂. (<http://www.soils-scotland.gov.uk/data/soil-carbon>). Both prime agricultural land and areas of peatland area are shown on Map 8.

Map 8: Prime Agricultural Land

3.4 The warming climate allows for a potential expansion of land used for agriculture and forestry in Scotland. Many areas that are currently marginal for cultivation due to climatic limitations could experience an improvement in land capability. There is the potential for the area of prime agricultural land in Scotland to expand by 20-40% by the 2050s. (reference below², p15)

3.5 However, climate change will also pose a number of threats, from more variable and extreme weather to the spread of pests and diseases, which may, limit this potential expansion of land use for agriculture and forestry.

Contaminated Land

3.6 The Council has a duty to inspect the region for contaminated land. From an initial desk based study in 2005, which identified over 15,000 sites potentially contaminated by a previous use, an inspection and screening programme has produced a list of approximately 70 priority sites. The area of potentially contaminated land within the region is

approximately 7486.7 ha which includes land that has previous industrial use, although a great deal of this is, or is likely to be, low risk. These sites include former uses such as gasworks, tanneries, waste disposal sites and military and munitions sites.

3.7 Progress is being made to investigate potentially contaminated sites through different channels. As brownfield land is developed, the planning system can be used to remediate sites to make them suitable for use. Wherever possible, voluntary remediation is encouraged and enforcement action can be taken in the most serious cases. Potentially contaminated sites are taken into account in the Local Development Plan.

Erosion

3.8 Given the extensive rural character of Dumfries and Galloway, there have been some issues of erosion, most often associated with flood events. There has also been erosion in certain coastal areas along the region's 350 km of coastline. The Council

² <https://documents.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Scotland-National-Summary.pdf> p9

published its Shoreline Management Plan (SMP) in 2005³. As only a small proportion of the region's coastline has coastal protection or flood defences the SMP study was an initial step in developing a coastal defence strategy for the Dumfries and Galloway coastline. The plan allows future defence options to be considered in a consistent manner, helping with the long term development along the coasts of Scotland. At a local level, this plan helps to identify the investment needed to safeguard human lives, and a wide range of assets, from the

threat posed by the sea. The document provides Dumfries and Galloway Council with priorities for coastal defence management, taking into account public safety, preservation of property and infrastructure, and preservation of the environment. In addition, it provides information on the assets at potential risk from erosion or flooding. The Council is in the process of carrying out an updated SMP to take into account the latest datasets on coastal erosion and potential impacts of global climate change.

3 SMP available at <http://www.dumgal.gov.uk/index.aspx?articleid=4694>

4. Water

Key issues

- there are a number of watercourses that are subject to potential flood risk
- the number of flood incidents has fluctuated over the years and appears to be directly related to rainfall
- the condition of water bodies has generally improved over the long term but not in the short term
- the quality of groundwater in the region is generally good but there appears to be a declining trend
- the quality of the public water supply is generally high although there is a relatively high number of private water supplies
- climate change may cause increased competition for water, as well as increased flood risks

Topic Introduction

4.1 This topic relates to water quality, water resources and flood risk/management.

Due to its geographical position, the region has an extensive coastline. However, within its inland areas are also an wide range of water

bodies encompassed in river valleys, lochs, ponds and manmade dams. Flooding in certain areas, particularly related to the Rivers Nith and Cree, occurs regularly.

SEA Objectives and Indicators

SEA Topic	SEA Objective	Indicators
Water	To manage and reduce flood risk and to support opportunities to do so through sustainable flood management (SuDS)	Maintain or reduce extent of flood risk
	To protect and enhance the state of the water environment	Maintain or improve the state of waterbodies

Data and Trends

Flood Risk

4.1 A number of water courses within the region are subject to potential flood risk and this is exacerbated in some locations by tidal influences. Land drainage issues in particular locations has also been raised as an issue on a number of sites and needs to be assessed and taken into account in developments in order that they do not exacerbate these issues.

4.2 From 2009 to 2015, there have been 943 recorded flooding incidents in Dumfries and Galloway. Over those 7 years, 26% of flooding incidents recorded have been attributed to either private or roads drainage whilst an additional 24% were attributed to surface water flooding. The high level of surface water flooding reported in 2015 was related to severe weather incidents and an increase in the average rainfall. Table 4.1 below shows the annual flood incidents.

Table 4.1: Annual flood incidences

Source	Year						
	2009	2010	2011	2012	2013	2014	2015
Assumed Fluvial	15	16	1	1	9	1	0
Coastal	1	0	5	0	1	35	5
Fluvial	38	13	29	24	24	12	46
Surface Runoff	8	7	18	26	17	31	120
Pluvial	18	4	21	35	36	6	3
Sewer	1	0	9	1	1	1	1
Reservoir	0	0	0	2	1	0	0
Other Draaaainage	80	14	29	17	54	23	34
Groundwater	0	0	6	39	1	2	1
Total	161	54	118	145	144	111	210

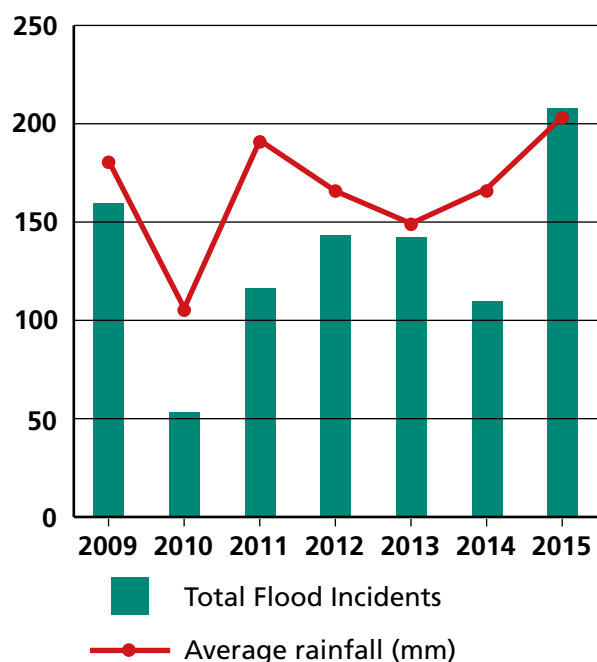
Source: Dumfries and Galloway Council. (Flood records maintained by DGC are not a definitive list of all flooding in the region. As they are updated through public reports and staff observations there may be occurrences of flooding that are not brought to the attention of DGC.)

4.3 Average rainfall per month in Dumfries and Galloway has generally increased over the last 7 years and this has been reflected in the number of

recorded flooding incidents in the region. Table 4.2 and Fig.4a below indicate the relationship between rainfall and flood incidents in the region.

Table 4.2 and Fig.4a: Relationship between rainfall and flood incidents

Year	Average rainfall/ Month (mm)	Total flood Incidents
2009	181.6	161
2010	106.9	54
2011	190.8	118
2012	166.3	145
2013	149.6	144
2014	166.9	111
2015	204.3	210



Source: Met Office data for DandG Source: Dumfries and Galloway Council

4.4 Under the Flood Risk Management (Scotland) Act 2009, Dumfries and Galloway Council has a duty to assess bodies of water and carry out works of clearance and repair where it will substantially reduce the risk of flooding. There are 121 sites in Dumfries and Galloway that receive programmed inspections in an effort to identify works of

clearance and repair. Programmed watercourse inspections are carried out throughout the region. There are also reactive inspections when concerns are reported. Where clearance and repair works are identified, they will be added to a schedule where works will be programmed based on risk, vulnerability and potential impacts.

4.5 The Local Flood Risk Management Plan (LFRMP)⁴ has been developed to detail the actions adopted to reduce the devastating and costly impact of flooding in the Solway Local Plan District. The LFRMP supplements the SEPA's Flood Risk Management Strategy (FRM Strategy) which coordinates the efforts of all organisations that tackle flooding from rivers, the sea or from surface water. The FRM Strategy identifies where the risk of flooding and benefits of investment are greatest.

4.6 The LFRMP for the Solway Local Plan District, describes the actions to avoid and reduce the risk of flooding, and prepare and protect ourselves, and our communities, within these potentially vulnerable areas and across the Local Plan District. These actions include three new flood protection schemes and completion of works of flood protection; 12 flood protection studies (including one natural flood management study); as well as flood warning schemes, surface water management plans.

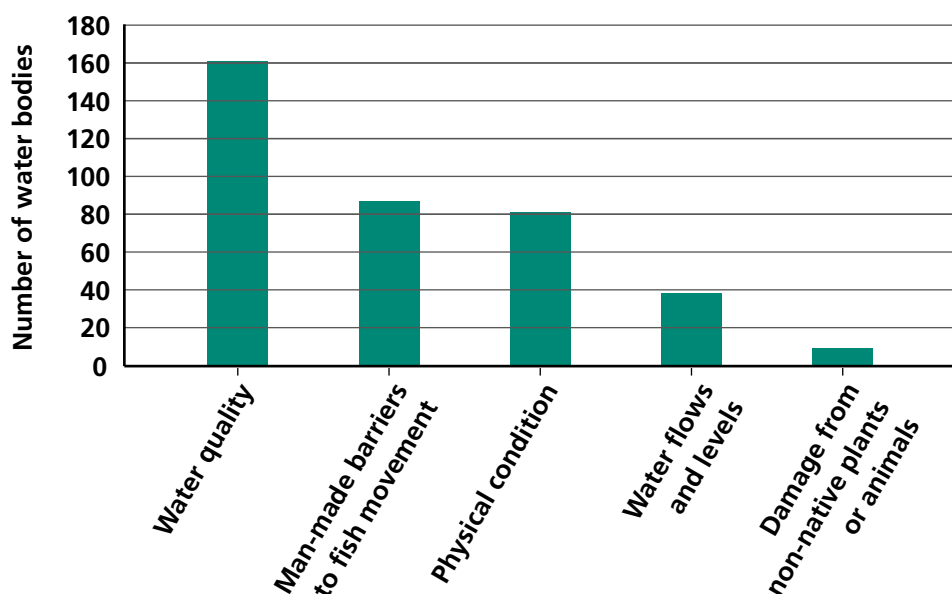
Water Quality

4.7 The River Basin Management Plan (RBPM)⁵ for the Solway Tweed river basin district, which includes Dumfries and Galloway as well as parts of Scottish Borders and Cumbria, was first published in

2009 and was updated in 2015. Within the Solway Tweed river basin district, there are 624 river, lake, estuary, coastal and groundwater water bodies and 58 protected areas. Protected Areas are designated as needing special protection due to their importance for bathing, growing and harvesting shellfish or the conservation of wildlife of Europe-wide interest. In 2014, 54% of the district's water bodies and 64% of the Protected Areas were assessed as being in good status or higher in terms of their condition (compared to 49% of water bodies in 2008). This classification is based on the quality and quantity of water, the condition of the habitats within the water and at its edge, and the plants and animals living in the water environment. Poor or bad classifications indicate that the water bodies are increasingly affected by human activities.

4.8 It is important that the condition of water bodies does not deteriorate further as a water environment which is in better condition will be more robust to deal with environmental changes such as increased temperatures and different rainfall patterns. 46% of water bodies and 36% of protected areas in the district are currently in less than good condition for the reasons shown in Fig. 4b below. However, it should be noted that some bodies may feature in more than one column.

Figure 4b: Causes of water bodies being in worse than good condition



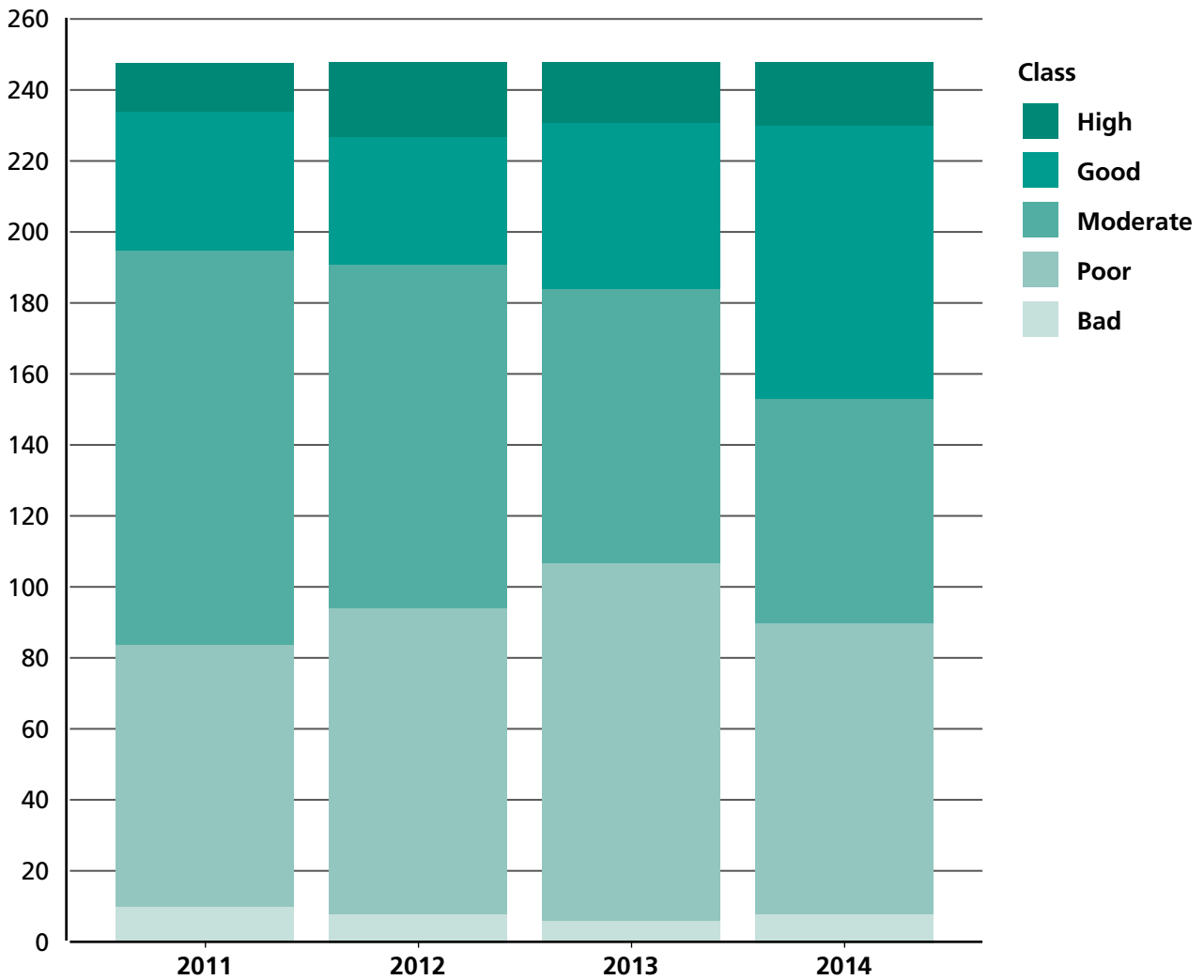
Source: The river basin management plan for the Solway Tweed river basin district: 2015 update (Environment Agency and Natural Scotland.)

4 LFRMP can be viewed at <http://www.dumgal.gov.uk/article/15215/Flood-risk-management-plan>

5 RBPM can be viewed at http://www.sepa.org.uk/media/218890/rbmp_solway_tweed_2015.pdf

Current data for specific surface water bodies specifically located in Dumfries and Galloway can be viewed at <http://www.environment.scotland.gov.uk/get-interactive/data/water-body-classification/> This information provides data on 248 water bodies within 15 catchment areas.

Fig.4c: Number of water bodies at each classification

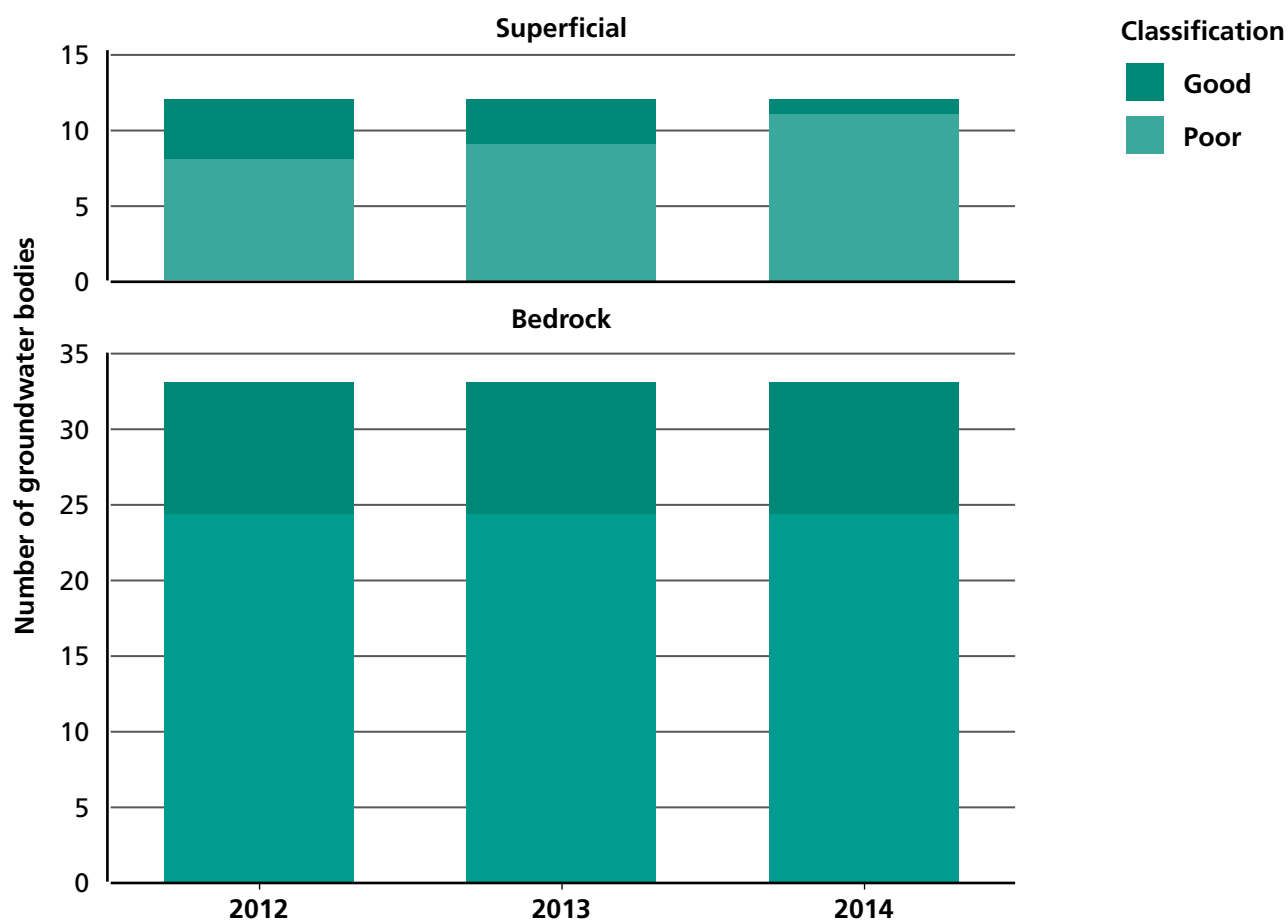


Source: <http://www.environment.scotland.gov.uk/get-interactive/data/water-body-classification/>

4.9 Groundwater in Dumfries and Galloway is mostly of good quality. Some areas have been impacted by pressures including mining, abstraction or impoundment and diffuse pollution from agriculture. Of the 45 groundwater bodies in the region, 8 were classified as poor in 2014.

Since 2012, 3 bodies have improved to a good classification whilst 4 have degraded to be classified as poor as shown in Fig 4d below. Current data can be found be viewed at <http://www.environment.scotland.gov.uk/get-interactive/data/groundwater/>

Fig.4d: Number of groundwaters at each classification



Source: <http://www.environment.scotland.gov.uk/get-interactive/data/groundwater/>

4.10 There continues to be issues in relation to acidification which affects seventeen water bodies in the region within the Dee, Cee, Bladnoch and the Fleet catchments. The amount of acid deposition, which is the primary cause of acidification in these water bodies, has substantially reduced as a result of controls on emissions of acidifying gases. However, due to the very sensitive nature of these catchments, their recovery is likely to be a long process. These issues are thought to have been exacerbated by commercial forestry operations in 12 of the affected waterbodies but actions are being taken to try to overcome and prevent these effects.

4.11 Rural diffuse pollution currently affects 114 water bodies in the Solway Tweed district from a range of sources but typically as a result of agricultural practices. The recovery time for these bodies will vary and it will take time for pollutants already in the environment to flush out of the system. Actions are being taken to try to overcome and prevent these effects.

Other Issues

4.12 The Dumfries Basin sandstone aquifer is one of the most productive in Scotland and supports groundwater abstraction for public supply, agriculture and industry. Abstraction is concentrated in the western part of the basin, where falling groundwater levels and deteriorating water quality both reflect the effects of intense pumping.

4.13 The commercial harvesting of shellfish (including scallops, cockles, oysters and razorfish, etc.) is an important economic activity in the region. Onshore and offshore development may impact on the water quality or habitat of the classified shellfish harvesting areas. Shellfish Classification Areas are located in the west of the region. The importance of ensuring a sustainable local shellfish fishery has resulted in Management Orders to control, for instance, the cockle fishery.

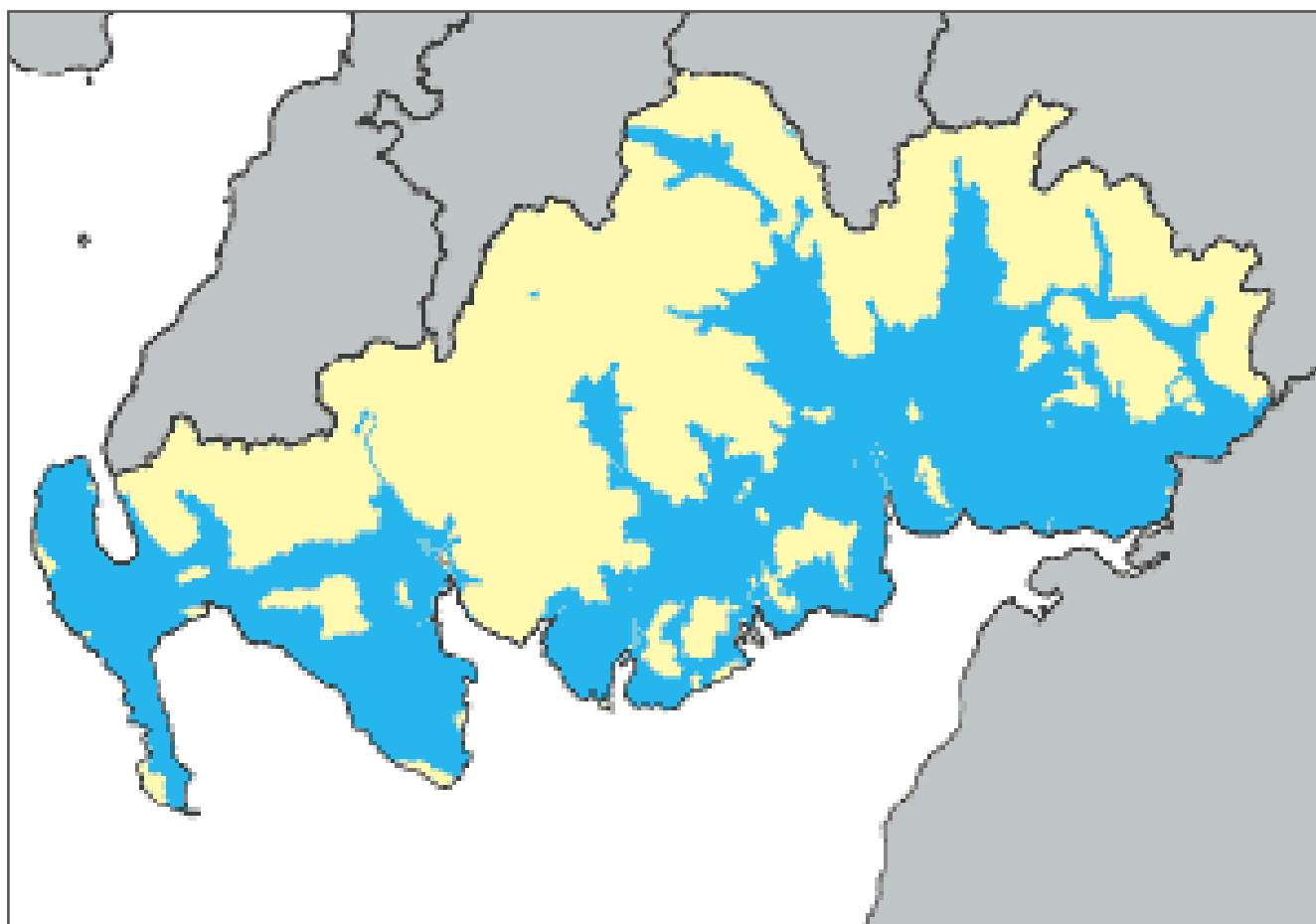
4.14 There are 16 protected drinking water sources within the Solway Tweed river basin district, 6 of which are considered to be currently at risk.

4.15 The quality of the public water supply is generally high at 99.95% and is monitored annually by Drinking Water Quality Regulator for Scotland. Further information can be found at www.dwqr.scot/

4.16 The region has a high percentage of Private Water Supplies at 1418 identified private water supplies which not only provide drinking water in domestic dwellings but are also used to bolster farm supplies and as part of many larger businesses instance e.g. for cleaning purposes. Private water supplies are divided into two types, Type A supply

more than 50 people, provide 10 or more cubic metres a day or are supplying premises that perform commercial or public activities whilst Type B are all other forms of domestic service, some of which will serve single properties. The region has 167 Type A supplies and 1,242 Type b supplies (1,409 in total) serving 13.48% of Scotland's population (source: Drinking Water in Scotland 2014 Private Water Supplies - dwqr). Of the 167 Type A supplies 164 had a completed or reviewed risk assessment in 2014

Map 9: Indicates the extents of the Council area in yellow whilst the blue area indicates Scottish Water's supply area.



Source: <http://www.gov.scot/Publications/2009/07/23170951/5>

4.17 The Council supports the incorporation of Sustainable Drainage Systems (SuDS) into all new developments. A National Agreement was put in place in June 2016 between local authorities and Scottish Water in relation to the responsibilities for the maintenance of SuDS features, although

in practice this may have limited relevance to Dumfries and Galloway.

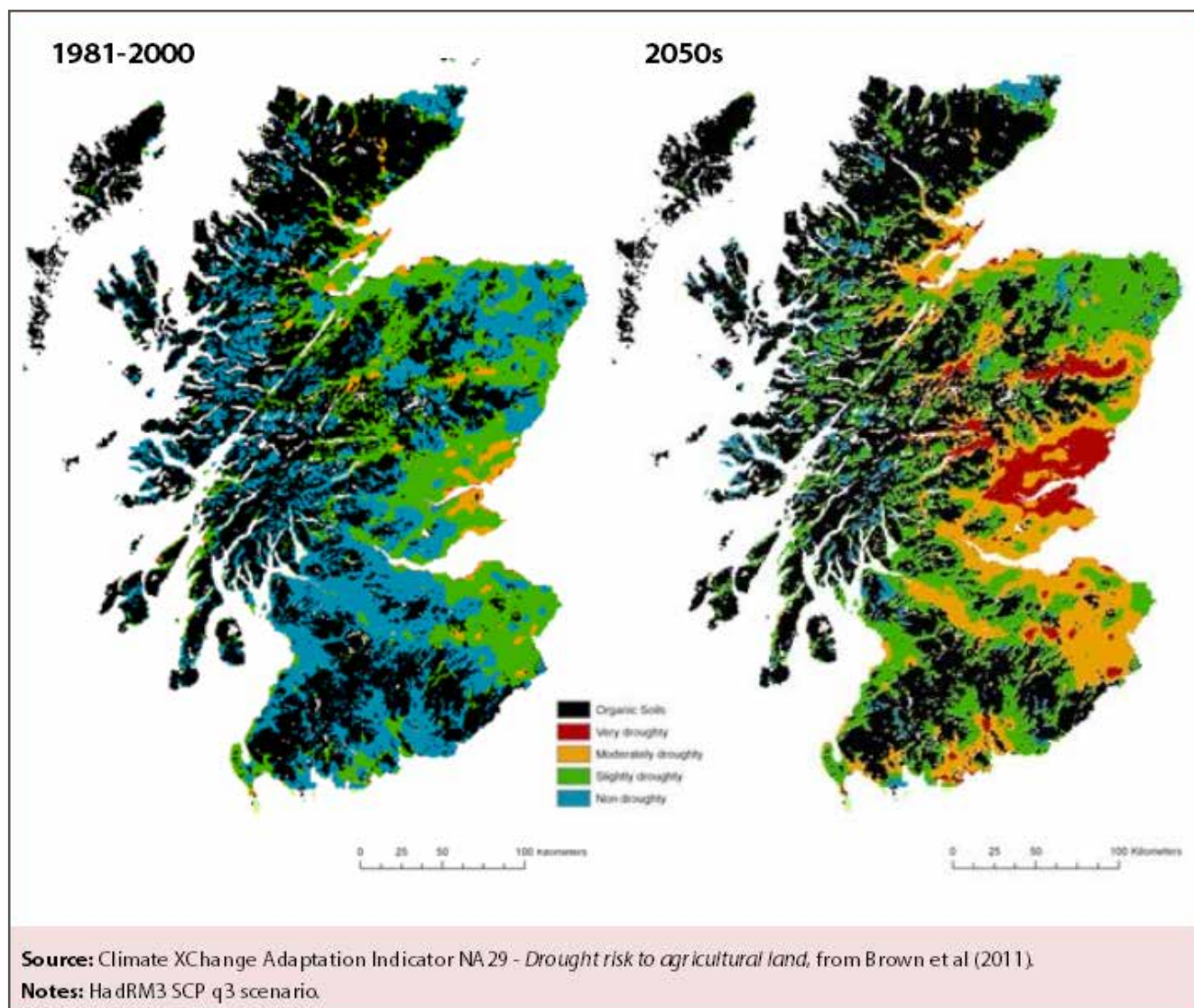
4.18 As our climate warms and rainfall patterns change, there may be increased competition for water between households, agriculture, industry and the needs of the natural environment.⁶

7 Scottish Government 2014. 'Climate Ready Scotland: Scottish Climate Change Adaptation Programme' Edinburgh: Scottish Government Available at: <http://www.scotland.gov.uk/Publications/2014/05/4669> p15

4.19 Private water supplies may be more vulnerable to changes in our climate such as drought and increased risk of poor quality due to higher temperatures or disruption to watercourses

4.20 Models predict that up to 40-50% of Scotland's prime agricultural land in the 2050s will be at moderate to severe drought risk (Figure 4e)

Figure 4e: Projected drought risk for wheat production in Scotland in the 2050s compared to 1981-2000 baseline



Source: <https://documents.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Scotland-National-Summary.pdf> p16

5. Air

Key issues

- air quality within the region is generally good
- there are no Air Quality Management Areas within the region

Topic Introduction

5.1 This topic is concerned with the levels of pollutants emitted into the air and the risks that resulting deterioration in air quality poses to the environment and and/or human health. There are no significant issues as air quality in the region is generally high in terms of national air quality objectives. There are no Air Quality Management Areas within the region.

5.2 Air quality has considerably improved throughout Scotland over the last few decades. This has been achieved primarily through tighter controls on pollutant emissions from industry, transport and domestic sources, although further work and monitoring is required. The release of pollutants (such as nitrogen oxides, sulphur dioxide, volatile organic carbons and particulates) and any secondary pollutants produced (such as ozone) can have detrimental impacts, not only on human health but also on habitats (through changing ecosystems), building materials (through erosion), climate change (by the release of greenhouse gases) and general nuisance.

5.3 The Local Air Management Quality Management process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must designate as an air quality management area where it appears likely that exceedences will occur and prepare an air quality action plan setting out the measures it intends to put in place in pursuit of the objectives. Air quality progress reports require to be submitted annually to the Scottish Government and SEPA.

5.4 The air quality objectives applicable to local air quality management in Scotland are set out in the Air Quality (Scotland) Regulations 2000 (Scottish Statutory Instrument (SSI) No.97) and the Air Quality (Scotland) (Amendment) Regulations 2002 (SSI No.297) and 2016 (SSI No.162).

SEA Objectives and Indicators

SEA Topic	SEA Objective	Indicators
Air	To maintain and, where possible, improve air quality	Air quality trends

Data and Trends

5.5 Air quality is affected by pollutants released into the atmosphere from a wide range of both natural sources and through human activities, such as transport and industry and can affect rural and urban areas. The main air pollutants are:

- nitrogen dioxide (NO₂)
- particulate matter (PM₁₀/PM_{2.5} - fine airborne particles);
- sulphur dioxide;

- ammonia;
- volatile organic compounds
- ozone

5.6 There are no Air Quality Management Areas within the region at present. The most recent Air Quality Progress Report for the region was published in May 2016. Previous air quality assessments have concluded that concentrations of carbon monoxide, benzene, 1,3-butadiene,

lead, sulphur dioxide and nitrogen dioxide are all unlikely to exceed the objectives whilst recent monitoring results for NO₂ have not identified any new requirement to proceed to a detailed assessment with concentrations all below the objectives. Previous monitoring at a worst-case junction in Dumfries showed that no air quality management areas were required to be designated for PM₁₀ in Dumfries. Screening monitoring for PM₁₀ commenced at Cairnryan in October 2015 following the relocation of the ferry terminal from Stranraer resulting a perceived increase in traffic levels. The screening will determine whether further, more detailed, assessments will be required.

5.7 There is a continuous NO₂ monitor located at Buccleuch Street, Dumfries which forms part of the UK Automatic Urban and Rural Air Quality Monitoring Network. As part of the same programme, a continuous NO₂ monitor has been

in place at the Eskdalemuir Observatory since 2004. There are a further 12 non-automatic monitoring sites within the Council area. From January 2014, 3 new sites were added, 2 of which due to their proximity to the M74 and a further site at a busy road junction in Dumfries. At the same time, 3 sites were discontinued, 1 of which was due to ferry closure in Stranraer traffic and 2 due to rationalisation of the number of monitoring sites.

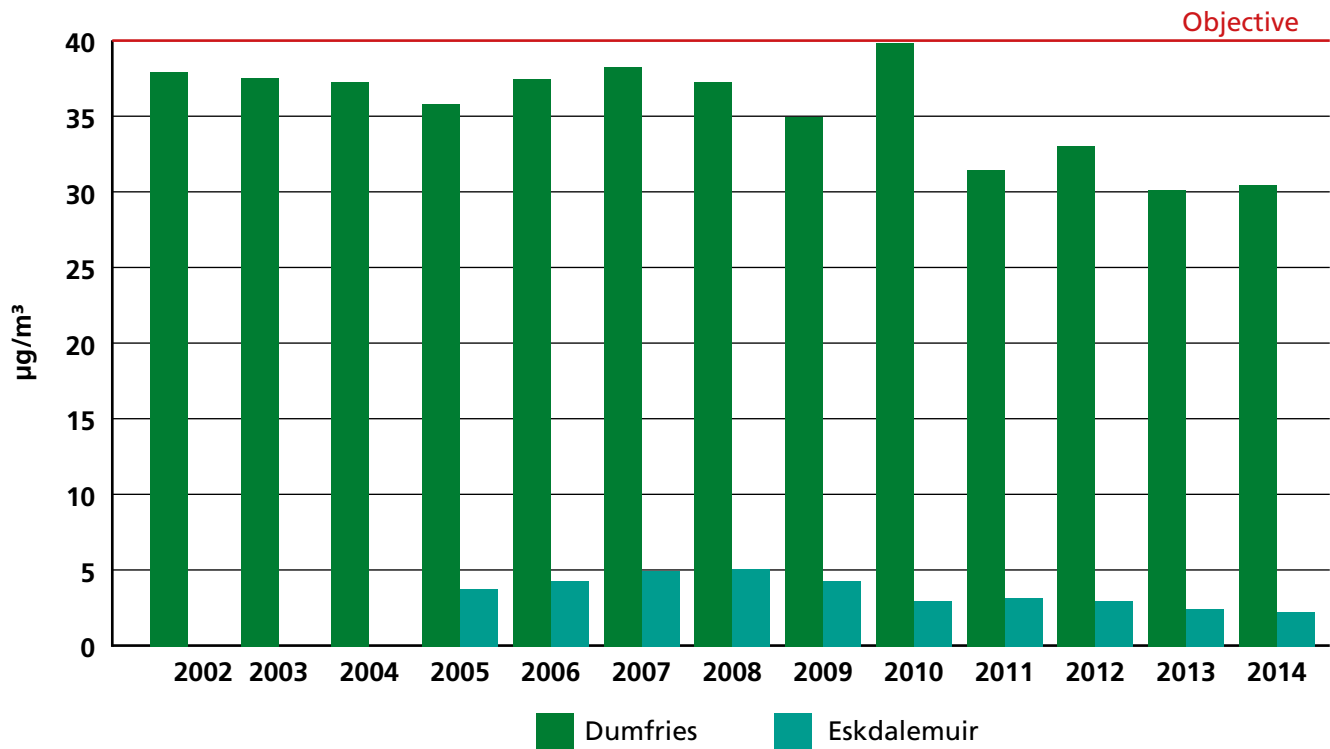
5.8 Table 5.1 below indicates the comparison with annual mean objective from both the automatic monitoring locations. Figure 5a shows that annual mean concentrations at the roadside site at Buccleuch Street, Dumfries have fallen significantly below the annual mean objective since 2010. The concentrations at Eskdalemuir remain well below the objective reflecting the site's rural background status

Table 5.1: Results of Monitoring for NO₂ at the automatic monitoring sites at Dumfries and at Eskdalemuir.

Annual mean concentrations (µg/m³)

Location	Within AQMA?	Data Capture for full calendar year 2014 %	Annual mean concentrations (µg/m ³)												
			2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Buccleuch St, Dumfries (Roadside site)	No	98.87%	38.0	37.6	37.3	35.9	37.5	38.3	37.3	35.0	39.9	31.5	33.1	30.2	30.5
Eskdalemuir (Rural site)	No	98.89%	n/a	n/a	n/a	3.8	4.3	5.0	5.1	4.3	3.0	3.2	3.0	2.5	2.3

Figure 5a: Trends in annual mean NO₂ concentrations at the automatic monitoring sites at Dumfries and at Eskdalemuir.



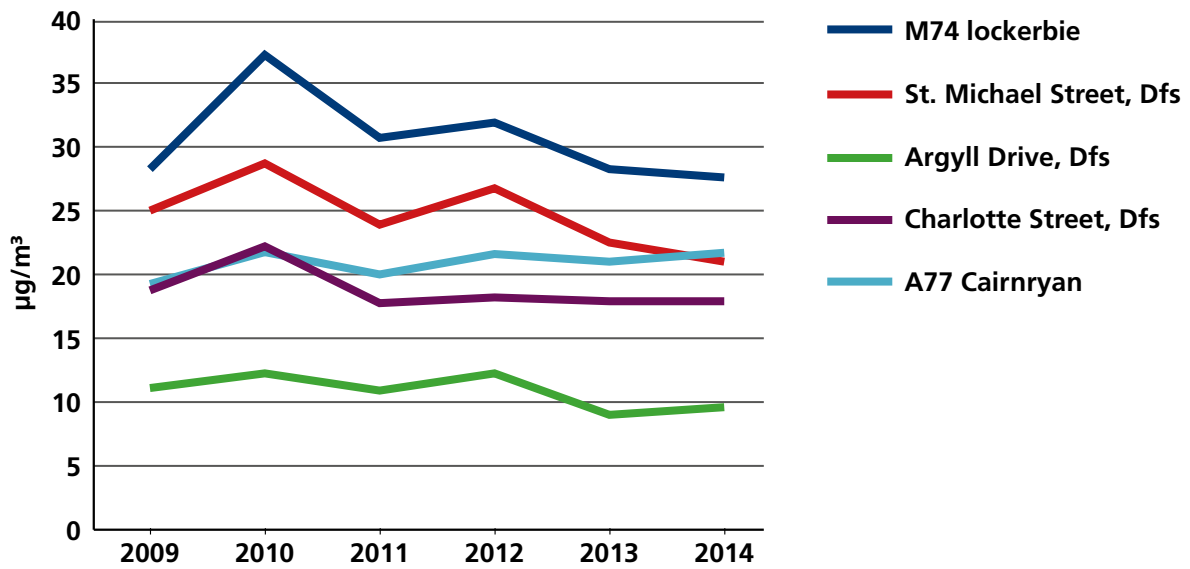
5.9 Table 5.2 shows the results of automatic monitoring for nitrogen dioxide as a comparison with 1-hour mean objective which is that 200µg/m³ should not be exceeded more than 18 times. As can be seen, an hourly mean greater than 200 µgm³

has only been recorded a few times at Dumfries over the years and not at all at Eskdalemuir (since automatic monitoring commenced respectively in 2002 and 2005).

Table 5.2: Results of automatic Monitoring for nitrogen dioxide at the automatic monitoring sites at Dumfries and at Eskdalemuir.

Location	Within AQMA?	Data Capture for full calendar year 2014 %	Number of hourly means >200µg/m ³												
			2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Buccleuch St, Dumfries (Roadside site)	No	98.87%	0	2	0	1	0	5	4	0	3	2	0	1	1
Eskdalemuir (Rural site)	No	98.89%	n/a	n/a	n/a	0	0	0	0	0	0	0	0	0	0

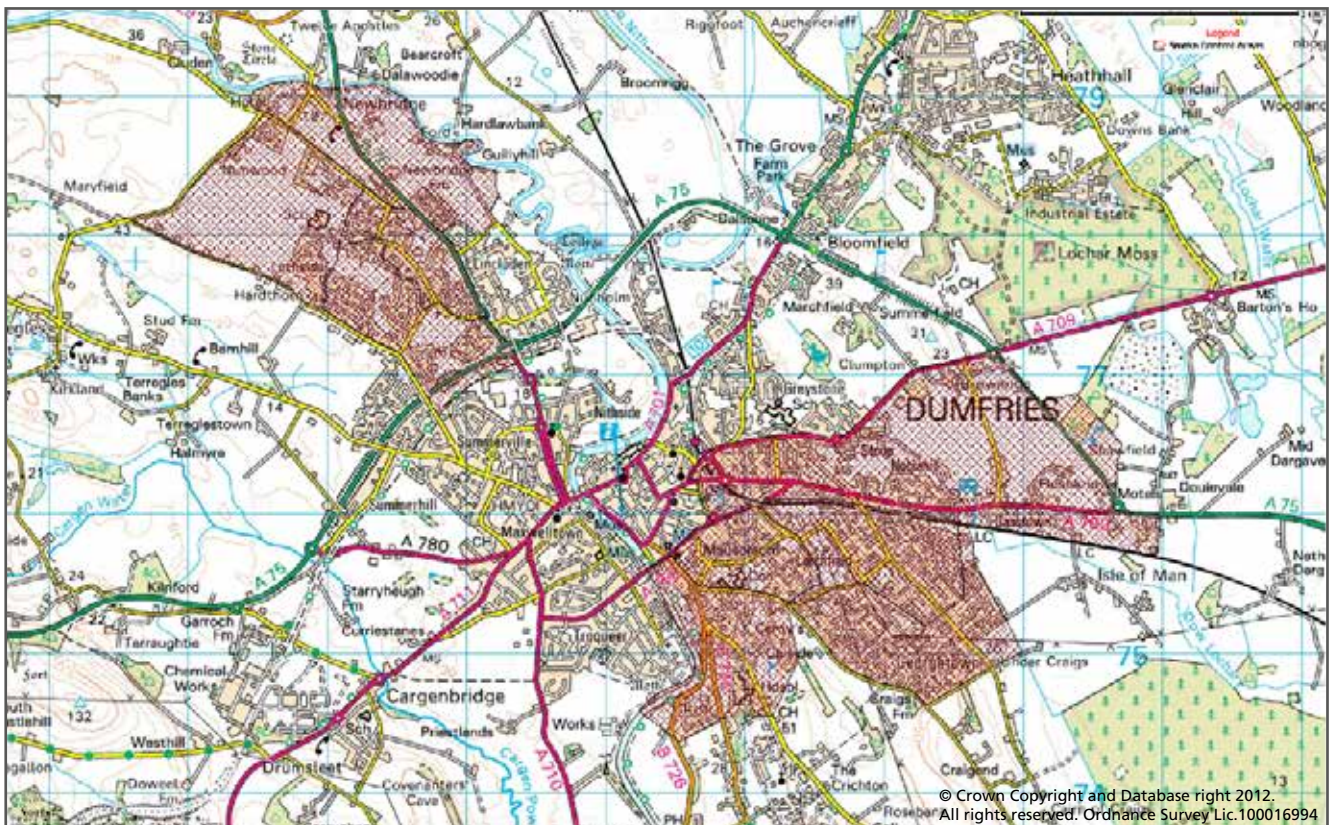
Figure 5b Below shows the annual mean nitrogen dioxide diffusion tube concentrations for the other sites within the region.



5.10 The likely impacts on air quality of road traffic, industrial, commercial, domestic and fugitive or uncontrolled sources of pollution have been assessed but no potential exceedences of the objectives have been identified as part of the Air Quality Progress Report.

5.11 There are several smoke control areas in Dumfries where households can only burn authorised fuels (such as anthracite and gas) or specified fuels for exempt appliances. These areas are shown on Map 10 below.

Map 10: Smoke Control Areas in Dumfries



5.12 Apart from PM10 levels currently being monitored in Cairnryan and the impact of the increasing popularity of biomass boilers and wood-

burning stoves, no potentially significant air quality issues have currently been highlighted in the region in terms of national air quality objectives.

6. Material Assets

Key issues

- the number of vacant and derelict sites in the region has recently reduced
- there are a number of important mineral resources in the region
- a programme to rollout recycling collections across the region is ongoing along with a regional network of household waste recycling centres
- designation of the Galloway Dark Sky Park has provided a driver to install LED street lights

Topic Introduction

6.1 The term material assets refers both to natural resources and infrastructure and refers specifically to minerals reserves and their extraction and the generation, processing, recycling and disposal of waste, including the reuse of land.

SEA Objectives and Indicators

SEA Topic	SEA Objective	Indicators
Material Assets	To manage, maintain and promote the sustainable use of natural resources	Encourage re-use of brownfield sites and buildings
	To reduce waste production and adopt sustainable waste management practices	Improve recycling facilities and practices

Data and Trends

Brownfield land

6.2 Although the Council wishes to improve the rate of new development on brownfield (previously developed) land there is a general lack of appropriate opportunities within the region. The relatively low availability of larger scale brownfield sites within the established settlements coupled with low land values in the area has resulted in such sites not always being attractive to developers. There are a number of larger scale brownfield sites located in rural areas, often as a result of wartime military and munitions operations.

Derelict and Vacant Land

6.3 Within the region, 0.1% of land is classed as derelict or vacant, giving a total of 432.62 ha. During the period 2013 to 2015, there has been a

reduction of vacant and derelict land either due to sites being brought back into productive use or those that no longer meet the Scottish Government criteria or have naturalised. There are now currently 44 sites identified in the survey, reduced from 51 recorded sites in the 2013 Survey. The majority are below 2 hectares (70%), with only 5 sites over 10 hectares. In addition, there is notably more derelict land (99%) by hectares to vacant land (1%) (426.43ha and 6.19ha respectively). The previous use of the most significant derelict land sites is inherited from Ministry of Defence activity including former Royal Ordnance, munitions and airfield sites, located outside of settlements.

Table 6.1: Total of derelict and urban vacant land in hectares

	2008	2009	2010	2011	2012	2013	2014	2015
Dumfries and Galloway	456	466	461	461	464	464	464*	434
Scotland	11,333	11,505	11,331	11,315	11,183	11,003	10,874	?

*carried over from 2013 survey as no report was produced in 2014

6.4 Of the sites that were removed from the list, 4 sites have been brought back into use, 2 for residential development, 1 for industrial development and 1 as an animal sanctuary. These sites amount to a total of 2.83 hectares. A further 3 sites were removed from the list, due to 1 being naturalised (26.7ha) and 2 no longer met the criteria (totalling 1.84ha). Further details can be found in the Vacant and Derelict Land Report⁷.

Mineral Extraction

6.4 Mineral extraction can provide economic benefits through the creation of jobs and supporting development however this must be balanced with the need to protect local

communities and the environment. Dumfries and Galloway possesses a variety of important mineral resources which can mainly be categorised as either aggregate (sand and gravel, sandstone and crushed rock) or non-aggregate (dimension sandstone, granite and greywacke). Historically, coal has been worked in upper Nithsdale (although all coaling in this area has ceased currently and the last site, Glenmuckloch, has been mostly restored) and there are also coal resources in lower Canonbie. Explorations have also been carried out in the region into the possibility of extracting coal bed methane in the eastern areas. Table 6.2 below indicates estimated mineral resources in the region

Table 6.2: Estimated mineral resource within the region

Resource	No. of active operators	Estimate of resources in million tonnes
Greywacke	7	17.3
Granite	2	6.5
Sand and gravel	12	Approx. 10 (1 unknown)
Dimension sandstone	4	0.62 (1 unknown)
Limestone	0	-
Crushed rock	1	5

Waste Management

6.5 Dealing with waste in a large rural area is a major challenge. The Council provides a waste collection service to over 70,000 households and commercial premises who generate around 90,000 tonnes of waste per year. The Council is currently rolling out recycling collections to domestic premises to comply with the Waste (Scotland) Regulations 2012 and has signed the Scottish Governments Charter for Household Recycling which seeks to provide consistent recycling services to households across Scotland.

6.6 The Dumfries and Galloway Council Waste Resource Management Strategy 2012-2020 sets out ambitious plans to increase recycling and divert all biodegradable waste from landfill. The proposals include two Zero Waste Parks which will manage waste collected through separate recycling collections, provide reuse and composting services. To process residual waste currently landfilled following treatment in the Ecodeco plant two new secondary recycling facilities will also be developed and operated by the Council.

⁷ The Report can be found at <http://www.dumgal.gov.uk/CHttpHandler.ashx?id=17568&np=0>.

6.7 Within the region, there will be 13 household waste recycling centres which allow householders to recycle a wide range of household materials. A new state of the art household education and recycling facility in Dumfries is being constructed to replace the current Lochar Moss facility.

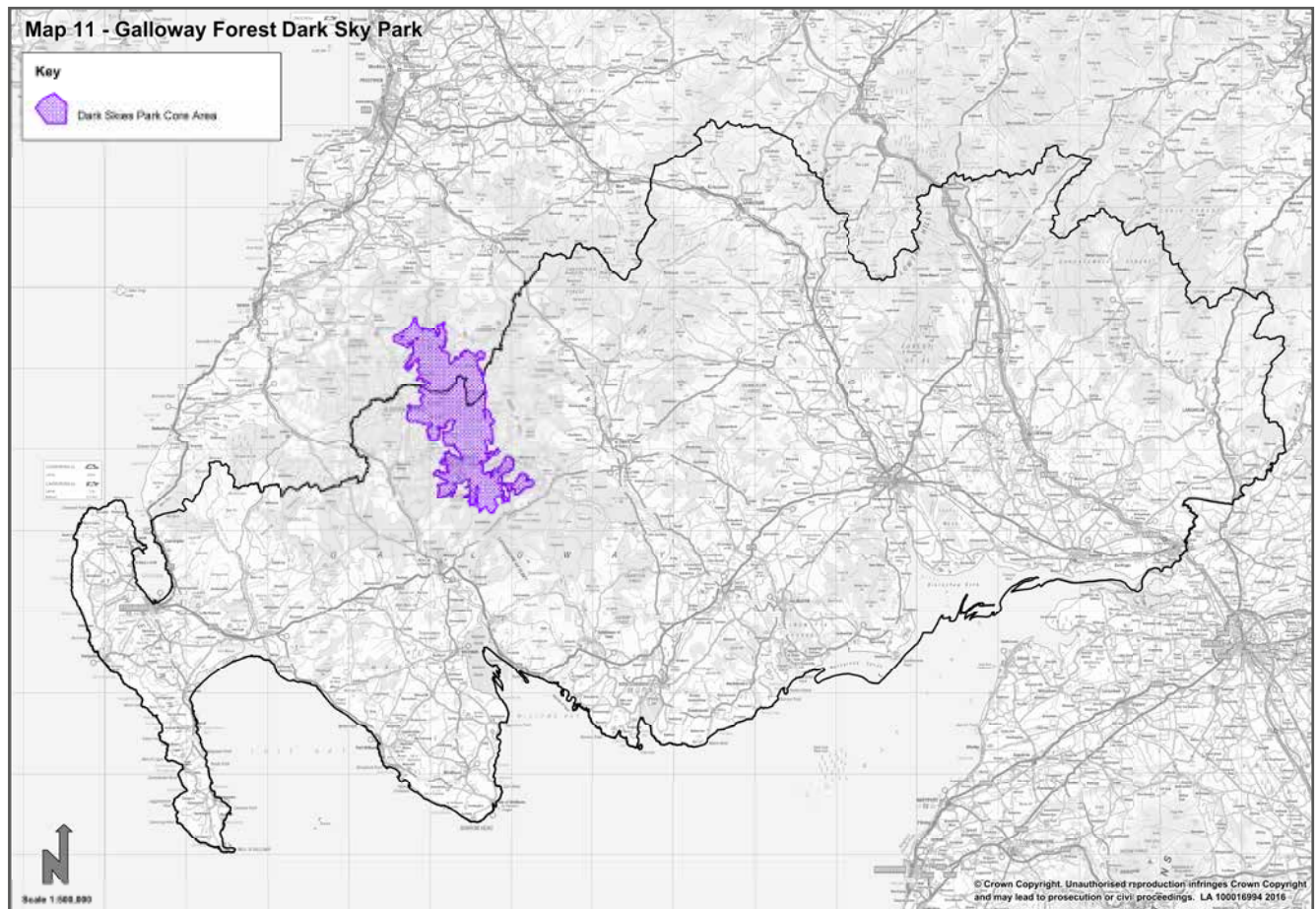
Dark Sky Park

6.8 The Galloway Forest Park received Gold Tier Dark Sky Park Status from the International Dark Sky Association in 2009 due to the exceptional quality of the night sky in this area. This award demonstrates how clear the night environment is in the Park and gives international recognition to its unique qualities. Due to the continuing increase

in light pollution nationally, it is estimated that 80% of the UK’s pollution will never see a true dark sky. The Dark Sky Park (DSP) is therefore an important and unique natural resource that should be protected.

6.9 The DSP itself comprises a Core area and covers 15,060 hectares and straddles three local authority areas (Dumfries and Galloway, East and South Ayrshire). It has few properties or businesses within its boundaries and, therefore, any light within the area (depending on the topography) can be particularly conspicuous. Map 11 shows the boundary of the core area of the DSP.

Map 11: Galloway Forest Dark Sky Park



6.10 DSP status helps attract tourists to the region, particularly in winter, helping to extend the region's visitor appeal beyond the summer months. A report in 2013/14 indicates that the Park has made a direct contribution of over £500,000 a year in additional income to the local economy. There remains a considerable opportunity to further boost DSP-related tourism so sustainable and sympathetic development is encouraged to provide facilities for tourists and strengthen and expand rural businesses.

6.11 The DSP is home to a large variety of nocturnal wildlife species which thrive within this intrinsically dark landscape. Studies have found that human health and ecosystems can be adversely affected by excessive artificial lighting.

Maintaining the quality of the DSP will therefore have significant wider benefits for the natural environment.

6.12 Lighting and the power it uses is a significant contributor to the carbon emissions we create. Lighting which is Dark Sky-friendly will not only prevent light pollution but could also reduce energy wastage, which can offer significant cost savings to businesses and individuals. Street lighting in Dumfries and Galloway is being changed to LED over an 8 year programme. As at November 2016 60% of Dumfries and Galloway's lighting stock had been changed to LED, resulting in a 25% reduction in energy bills. Where halogen lighting can be changed to LED the energy consumption saving can be more than 90%.

7. Climatic Factors

Key issues

- anticipated that summers will be warmer and drier, autumn and winter will be milder and wetter, with an increase in intense rainfall, and rising sea levels
- there are a significant number of renewable energy schemes installed throughout the region using a variety of technologies with wind and hydro being the main elements
- car ownership in the region is relatively high recognising the relatively sparse population and limited public transport options
- rail usage has increased in the region however overall the region is poorly served by rail routes
- observed climate changes have had impacts on many aspects of our environment, the resilience of our businesses, the health and well-being of our people and our infrastructure and these impacts will continue and even intensify in the projected future climate

Topic Introduction

7.1 This topic is concerned with reducing the region's greenhouse gas (GHG) emissions, assessing the likely effects of historic and projected GHG emissions and the ability to adapt to the consequent unavoidable effects of climate change. The world's climate is changing at an unprecedented rate, mainly caused by increasing concentrations of greenhouse gases in the world's atmosphere. Scotland's State of the Environment Report (2014)⁸ states that globally, the biggest challenge to the environment is climate change. The Climate Change (Scotland) Act 2009 makes

a commitment to cut GHG emissions in Scotland by 80% of 1990 levels by 2050. The Act sets a framework for action in Scotland to reduce emissions as well as to adapt to a changing climate.

7.2 The region has seen a growth in the use of renewable energy in recent years, particularly at the micro/domestic scale. Due to the rural nature of the region, the population is more dependent on their own transport and therefore emissions of carbon dioxide from transportation are considerably higher than in Scotland as a whole.

SEA Objectives and Indicators

SEA Topic	SEA Objective	Indicators
Climatic Factors	To contribute to the reduction of greenhouse gases and reduce energy consumption	Changes in carbon emissions
	To promote sustainable energy technologies and energy efficiency	Number of domestic and commercial renewable energy applications and installations
	To minimise/reduce the need for travel by car	Changes in travel patterns Number of Developments with Implemented Travel Plans

Data and Trends

7.3 In 2013, the global concentration of carbon dioxide in the atmosphere, the primary driver of recent climate change, reached 400 parts per million (ppm) for the first time in recorded

history, according to data from the Mauna Loa Observatory in Hawaii.⁹ The international climate negotiations at COP21 led to the 'Paris Agreement' which was adopted by 195 countries

⁸ Critchlow-Watton, N., Dobbie, K.E., Bell, R., Campbell, S.D.G., Hinze, D., Motion, A., Robertson, K., Russell, M., Simpson, J., Thomson, D. and Towers, W. (eds) 2014. Scotland's State of the Environment Report, 2014. Scotland's Environment Web. <http://www.environment.scotland.gov.uk/> p7

⁹ Climate Change: Vital Signs of the Planet climate. nasa.gov/400ppmquotes/

on 12 December 2015. The Agreement was ratified and took effect on 4 November 2016. This, the world's first comprehensive climate agreement, has focused attention across all sectors of society on the need to further reduce global GHG emissions. It is widely acknowledged that very few countries have actually legislated to bring about a reduction in their emissions. Scotland passed legislation committing to reductions in 2009 and has announced that, in early 2017, a new Climate

Change Bill will include an ambitious new 2020 target to reduce actual Scottish emissions by more than 50%.

7.4 In Scotland in 2012 net emissions of the six main GHGs created by human activities were estimated to be 52.9 million tonnes of carbon dioxide equivalent (million tonnes CO₂ equivalent). The sources and amounts of GHGs emitted in 2012 are shown in Table 7.1

Table 7.1: Scottish greenhouse gas emissions, 2012

Source of greenhouse gas emissions	Greenhouse gas emissions in 2012 (million tonnes CO ₂ eq)	Share of 2012 emissions (%)
Energy supply	17.13	32
Domestic transport	10.54	20
International aviation and shipping	2.36	5
Business and industrial process	8.53	16
Residential	7.28	14
Public sector	1.37	3
Waste management	2.77	5
Development	1.68	3
Agriculture and related land use	11.17	21
Forestry	-9.92	-19
Total	52.9	100

Source: Scotland's SOER p186)

7.5 Annual GHG emissions within the region for the period 2005-2014 are summarised in Table 7.2 below and overall appear less per capita than in wider Scotland (3620.92Kg/capita against 4859.89 Kg/capita)

Table 7.2: Historic Emissions for Dumfries and Galloway region

Dataset	Sector	Year										Units
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
DECC Sectors	Total Emissions	1711.66	1669.37	1711.87	1640.46	1544.22	1650.55	1534.71	1567.32	1554.89	1439.49	ktCO ₂
	Industry and Commercial	660.59	622.95	657.46	604.47	570.46	643.15	602.13	616.59	622.41	558.96	ktCO ₂
	Domestic	465.32	465.75	451.35	460.18	423.32	454.11	388.26	410.7	392.48	334.63	ktCO ₂
	Transport total	585.75	580.67	603.06	575.81	550.43	553.29	544.32	540.03	540.00	545.90	ktCO ₂
	Per capita	1.76	1.20	1.45	0.79	0.17	0.80	-0.20	0.10	0.27	-0.27	tCO ₂
Other Sectors	Waste											tCO ₂ e
	LULUCF Net Emissions	-1448.77	-1489.26	-1494.14	-1520.78	-1518.20	-1529.42	-1565.63	-1551.90	-1513.86	-1479.37	ktCO ₂
	Other (Specify in comments)											

Source: Department of Energy and Climate Change

Renewable Energy

7.6 The region is contributing to the de-carbonisation of Scotland's energy supply with a growth in the use of renewable energy in recent years, at both the micro/domestic scale as well as large scale wind and biomass energy.

7.7 The region has seen a large number of renewable energy projects from a diverse range of sources. In 2010 the region had the highest number of renewable schemes approved/installed or submitted applications in Scotland and the second highest total generating capacity (SNH) in respect of larger schemes which include both on and offshore wind energy developments, large scale hydro works around the River Dee (amounting to over 106MW in total capacity) and a 40MW biomass plant at Lockerbie.

7.6 At the micro-generation level the region has consistently been in the vanguard of installation levels in Scotland, although this doesn't necessarily equate to the highest installed capacity. DGHP, the largest social rented landlord operating in the region, has been rolling out the installation of a number of energy sources to its properties which are outside the areas covered by mainline gas supplies. Up to January 2016 this amounted to the installation of air source heat pumps to 1173 properties, electric wet installations at 165 properties, 8 properties installed with biomass and 12 properties installed with ground source heat pumps and is approximately 10% of their housing stock.

7.7 Table 7.3 below sets out the current situation in region at both the small and large scale.

Table 7.3: Renewable energy installations in the region

Description	2012/13	2015/16
Small Scale		
No. of solar PV installations up to 100kWp	2006 (6176kWp)	2682 (10614kWp)
No. of micro hydro installations	23 (380kWp)	65 (2100 kWp)
Small scale onshore wind installations	204 (3339kWp)	253 (7246 kWp)
Large Scale		
Offshore wind installations	1 site (180MW)	1 site (180MW)
Onshore wind installations (operational)	10 sites (255.53MW)	16 sites (233MW)
Onshore wind installations (consented)	12 sites (617.70MW)	20 sites (556MW) (4 sites only 1 turbine)
Hydro installations	6 sites (106MW)	6 sites (106MW)
Large scale biomass	1 site (44MW)	1 site (44MW)

Source: Ofgen Feed-in-Tariff installation report 2016 kWp = Kilowatt Peak MW = Mega Watt 1MW = 1000kW

7.8 Although an increasing supply of electricity in the region is produced from renewable resources for many in rural areas heating is often provided by liquid petroleum gas, oil or solid fuel. This raises the propensity for fuel poverty which has been recognised as an increasing problem in rural areas. The emissions associated with oil, LPG, electricity and coal also continue to produce GHG emissions. The nature of the region's housing stock is also less efficient as it tends to be older and not readily insulated to current standards in many cases.

7.9 It should be noted, however, that the increasing use of biomass boilers and wood burning stoves in both domestic and commercial properties is leading to an increase in complaints of smoke and smells and potential instances of statutory nuisance.

7.10 Climate change may influence Scotland's capacity to generate weather-dependent renewable energy. For example, varying water availability will affect hydro generation schemes. Climate change can also impact power distribution, with impacts ranging from damage caused by extreme weather events, to reduced transmission efficiency occurring as a result of temperature fluctuations. Impacts on global energy markets may also affect energy supplies in Scotland and consequently our overall energy security.

Carbon Management

7.11 Carbon management has become a major responsibility for all local authorities. The Council has to act to tackle climate change in response to legal and financial commitments which were put in place as a result of global concerns. The key legislation guiding this is the Climate Change (Scotland) 2009 Act whose progress is overseen by the UK Climate Change Committee and measured through the Climate Change plan.

7.12 The Council continues to recognise Carbon Management as both a cost and an emissions reduction issue. From 2015/16 all public sector major players have to produce a mandatory climate change report. The Council's revised Carbon Management Plan (CMP2) was published in 2011. This document details the driving factors behind the Council cutting carbon emissions and shows how carbon reduction targets set out in national legislation will be met in the key areas of energy consumption of stationary (buildings and street lighting), water, waste and transport.

7.13 The baseline carbon footprint for 2008/9 was set at 59,867tCO₂e¹⁰:NB this baseline now excludes the emissions from both the Fire and Rescue and Police Services which became separate

10 tCO₂e is tonnes of carbon dioxide equivalent and relates to global warming potential

organisations in April 2013). Emission reduction targets were set in CMP2 by the Council. A 20% target reduction of 11,973tCO₂e for 2014/15 and a 42% target reduction of 25,144 tCO₂e for 2019/20. Reflecting the national challenges, which were summarised by the Committee on Climate Change in their 2016 progress report¹¹ on emissions

reduction in Scotland, the main challenges for the Council are emissions from transport and buildings, can be seen from Table 7.4 below. Change in emissions between baseline 2008/09 and 2015/16 has decreased significantly for waste but not transport or stationary.

Table 7.4: Carbon Footprint of Dumfries and Galloway Council by source of emissions from baseline 2008/09

Type of source	Carbon Footprint (tCO ₂ e)							
	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Stationary	32,332	35,560	33,093	31,410	32,997	31,890	29,152	28,818
Water	240	117	177	177	149	114	94	271
Waste	21,542	23,748	23,748	18,384	13,630	10,499	9,780	11,716
Transport	5,752	2,805	2,341	4,337	2,302	2,637	10,249	6,415
Total	59,867	62,232	59,360	54,310	49,079	45,142	49,274	47,221

Transport

7.15 Due to the rural nature of the region, the population is often more dependent on their own transport and therefore emissions of carbon dioxide from transportation are considerably higher than in Scotland as a whole. However, greenhouse gases appear less per capita than in wider Scotland. Car ownership in the region rose from 74.7% in 2001 to 78.1% in 2011, compared to 65.8% to 69.5% in Scotland as whole for the same period. However, 23% of households do not have access to private transport.

7.16 There was an estimated 5 million passenger journeys in 2014/15, with a total of 7.22M miles undertaken by bus services on the network; 44% provided commercially and 56% provided as socially necessary services (4.04M miles) procured by South West of Scotland Transport Partnership (SWestrans). Commercial bus services operate the majority of the Dumfries Town Network and on the main corridors to Lockerbie, Ayr and Carlisle.

7.17 124,700 of those living in Dumfries and Galloway (83%) live in the 150 settlements with 30 or more residents. All 150 settlements have a level of local bus provision, with the remaining 25,200 residents residing either in smaller settlements on bus routes or are in deep rural areas with no bus service. Commercial bus services cover some 80,000

residents. Socially necessary provision is split across the areas:

Annandale and Eskdale:	4,000
Nithsdale:	3,200
Dumfries Town:	6,000
Stewartry:	8,500
Wigtown:	23,000

7.18 The 2011 Census statistics show that 3% of the region travel to work by bus or coach, compared to 10% in Scotland as a whole. However, a higher percentage of Dumfries and Galloway residents either work or study mainly from home (16%), or travel to work on foot (13%) than Scotland as whole (11% and 10% respectively).

7.19 A service using the first all-electric bus bought through the Scottish Green Bus Fund was launched in 2013. This initially provided a link for passengers between the Irish Sea ferry terminals at Cairnryan and the railway station at Stranraer but now operates on different routes.

7.20 Co-wheels car club operate an hourly on-street vehicle hire in 5 locations across Dumfries. This is available on a membership basis to private individuals and companies.

11 Available at: <https://www.theccc.org.uk/publication/reducing-emissions-in-scotland-2016-progress-report/>

7.21 It is estimated (Office of Rail and Road) that 862,764 journeys were made to and from rail stations in the region in 2014-15. This is up 6% from 2013-14 estimates. The Regional Transport Strategy includes aspirations for reopening four rail stations in the region. SWestrans is currently pursuing the reopening of stations at Thornhill, Eastriggs and Beattock through the STAG process. Currently, rail services are limited to three routes with a total of only seven operational railway stations.

Climate Change

7.22 To understand climate change, it is important to understand the difference between weather and climate. Weather is the temperature, precipitation (rain, hail, sleet and snow) and wind, which change hour by hour and day by day. Climate is the average weather we expect over a long period of

time, typically 30 years or longer. Infrequent spells of extreme cold weather regionally does not mean that climate change is not happening. 'Climate' is what you expect; 'weather' is what you get.¹²

7.23 Generally Scotland's climate is cool summers, mild winters and rainfall spread over the course of the year although there are regional differences.

7.24 The Region of Dumfries and Galloway is in 'West Scotland' as defined by the National Climate Information Centre. The significant climate trends in West Scotland since 1961 are summarised in Table 7.5. The collected data shows the climate has warmed, the growing season is longer, the amount of heating needed for buildings has decreased and, for most areas, the days with frost have decreased. Whereas rainfall has increased over 28% and days of heavy rainfall have increased by 12 days.

Table 7.5: Significant climate trends in West Scotland since 1961

Climate factor	Trends since 1961 (usually to 2011)	Season where change statistically significant
Annual Mean Temperature	Increase 1.3 °C	Spring, summer and autumn
Maximum temperature - annual	Increase 1.4 °C	All
Minimum temperature - annual	Increase 1.1 °C	Spring, summer and autumn
Air Frost	Decrease 15 days*	Spring and autumn
Ground Frost	Decrease 25.6 days*	Spring, summer and autumn
Length of Winter cold spells	Decrease 8.7 days	Winter
Length of Summer heat waves	Increase 4 days	Not significant
Spring Sunshine	Increase 0.6 hours per day	
Autumn Sunshine	Increase 0.3 hours per day	
Rainfall - annual	Increase 28.4%	Winter
Days of heavy rain	Increase 12 days (~20%)	Per annum
Length of growing season	Increase 39.9 days (>15%)	Mainly due to earlier spring
Growing degree days	Increase 25.7%	Per annum
Heating degree days	Decrease 15%	Per annum
Cooling degree days	Increase from 1 day to 4	Per annum
Average relative humidity	Decrease 2.1%	All
Snow cover- annual	Decrease	Autumn 77% reduction
Wind speed- annual	Decrease about 10%	Low confidence

(adapted from Scotland's Climate Trends Handbook)

*exception where some coastal parts show an increase e.g. around northern Luce Bay

12 Met Office nd. 'Understanding weather and climate' Crown copyright Available online only at: http://www.metoffice.gov.uk/media/pdf/a/4/Understanding_weather_and_climate_presentation.pdf

7.25 The most recent national projections of future climate change are provided through the UK Climate Projections (UKCP09) for both land and marine regions as well as observed (past) climate data for the UK produced by the Met Office’s Hadley Centre. It is considered that UKCP09 continues to provide a valid assessment of future UK climate over land, and it can still be used for adaptation planning.

7.26 The key climate change trends expected for Scotland are:

- hotter, drier summers
- milder, wetter autumns and winters,

We can also expect to see:

- an increase in summer heatwaves, extreme temperatures and drought
- increased frequency and intensity of extreme rainfall
- reduced frost and snowfall
- rising sea levels

7.27 UKCP09 climate projections for West of Scotland are available for the 2020s, 2050s and 2080s for three different scenarios of global GHG emissions, low, medium and high. The projections for the 2050s in a medium global GHG emissions scenario are provided in Table 7.6 below showing the mean projected changes in precipitation and temperature levels for the West Of Scotland.

Table 7.6: UKCP09 projections for mean temperature and precipitation for winter and summer for West of Scotland, including Dumfries and Galloway, in the 2050s based on a medium amount of emissions.

West Scotland

Winter	Mean temperature increase:	2.0°C	(1.0 - 3.0°C)
	Mean precipitation increase:	15%	(5 - 29%)
Summer	Mean temperature increase:	2.4°C	(1.1 - 3.8°C)
	Mean precipitation increase:	-13%	(-27 - 1%)

The number in bold is the mid point of the probability range. The numbers in brackets show the range within which the actual change is likely to be

Source: Adaptation Scotland

7.28 Some of the significant consequences of this future climate change are identified in the Scottish Climate Change Adaptation Programme¹³. They include challenges, and some opportunities, for our environment, the resilience of our businesses, the health and well-being of our people and our infrastructure - connectivity and interdependencies.

7.29 The main impacts of climate change on people are likely to be caused by an increasing number of flood incidents and landslides caused by more frequent extreme weather events and rising sea levels. Such incidents are likely to disrupt road and rail links and damage buildings. However, there may be less disruption due to a reduced occurrence of snow and ice. The milder, wetter

autumn and winters may result in houses becoming damper, increasing the growth of algae and fungi, with knock-on effects for health. During the winter there is likely to be less demand for energy for heating but in summer there may be more demand for cooling.

7.30 Climate change may have an impact on global food production. Although Scotland may be able to grow more food, this will not offset the impact global disruption has on us. The effects of increased volatility in the global commodity market due to exposure to extreme climatic events has an impact on supply and cost of food.

7.31 The performance of our buildings will be challenged by climate change with impacts on the design, construction, management and use of our buildings and surroundings. Whether retrofitting existing or building new, it is likely that there will be issues with water management (in flood and drought), weather resistance and overheating.

7.32 Our energy, transport, water, and ICT networks support services are vital to our health and wellbeing, and economic prosperity. The effect of climate change on these infrastructure systems will be varied. They are likely to be

impacted by an increase in disruptive events such as flooding, landslides, drought, and heatwaves. Our infrastructure is closely inter-linked and failure in any area can lead to wider disruption across these networks.

7.33 The resilience of our businesses will be affected. Extreme weather may disrupt transport, energy and communication networks in Scotland and around the world. This could impact on markets, affect supply chains and raise insurance costs.

8. Cultural Heritage

Key issues

- the region contains a range of diverse historic assets there have been few changes to the number of designated historic assets
- a significant number of historic assets are under-used or in poor condition
- within the region, there are potential restoration schemes for 15 of the buildings on the Buildings at Risk Register for Scotland
- there are a relatively high number of designated archaeological sites throughout the region

Topic Introduction

8.1 This topic includes historic landscapes, buildings, monuments, sites and places and their settings. Dumfries and Galloway has a rich legacy of attractive towns, villages and countryside which include an extensive collection of historic buildings, objects or structures that are considered to be of national, regional or local interest. A large number

are formally Listed as being of architectural or historic importance. The region also contains a wealth of archaeological sites, showing human activity for the past 10,000 years. The settlements, steadings and man-made structures are part of the wider distinctive historic landscape some of which have special designations.

SEA Objectives and Indicators

SEA Topic	SEA Objective	Indicators
Cultural Heritage	To protect and enhance the region's rich built and historic environment including its setting	Number and condition of designated and non-designated sites

Data and Trends

8.2 The region has a rich cultural heritage. Table 8.1 provides details on the range of designations within the region including traditional vernacular buildings, historic settlements and features in the landscape. Historic Environment Scotland (HES) review the Listings and Inventory Designed Gardens on request or by theme and have made a small number of changes to the Category of Listed Buildings since the adoption of the LDP in 2014. However, the proportion of Listed Buildings

to the population of the region is 23 per 1000, notably higher than the 9 per 1000 in Scotland as a whole. Dumfries and Galloway has approximately 7.2% of the total Listed Buildings in Scotland. HES is currently reviewing those locations that have dual designations (i.e. those which are both Listed Buildings and Scheduled Monuments) and this will result in removing one of the designations thereby reducing the number of overall designations in the future.

Table 8.1: Historic Assets

Listed Buildings	3449 (6.3% are Category A and 53% are Category B)
Conservation Areas	36
Archaeological Sensitive Areas	32
Scheduled Monuments	1045
Inventory Designed Gardens or Landscapes	20
Non-Inventory Gardens and Designed Landscapes	108
Historic Battlefields	1

8.3 Any changes to designations or the status of sites since the LDP was adopted in 2014 are shown in Table 8.2 below.

Table 8.2: Changes to Designations since 2014

Changes to Designations:	
Listed Buildings - Category Change	
C to B	1
B to C	2
B to non-Listed	1 entry (terrace of 31 dwellings)
C to non-Listed	2
Listed Buildings - removal of elements from Listing	2
Scheduled Monuments - removal of elements from schedule	2
Inventory Gardens or Designed Landscapes - removed from inventory	1 (Castlehill) now a Non-Inventory Designed Garden or Landscape

8.4 Scotland's State of the Environment Report 2014 recognises the unique and irreplaceable historic assets and the economic value they have as part of tourism. This is very much the case in Dumfries and Galloway where many significant traditional and historic buildings and their settings are at risk from neglect, inappropriate alterations, a lack of investment or inability to find a new use. This is a recognised Scotland-wide issue which can affect the fabric of individual buildings and their historic and architectural integrity; can have an adverse impact on the character of Conservation Areas; and can damage the original design of a landscape or garden. However, there are also good examples of individual and groups of buildings being restored, adapted or given a new use.

8.5 The increased pace of climate change presents challenges to all those involved in the care, protection and promotion of the historic environment. The changing climate is already threatening our Scottish historic environment through coastal erosion, flooding and wetter, warmer conditions. The need to make adaptations for climate change raises expectations that historic buildings should meet modern standards of insulation, etc.using modern methods which are not always compatible with historic materials. This

can also apply to expectations of being able to follow new trends in the layout and use of interior spaces which may be a threat to some of the original historic fabric inside a building or outside it for parking and access.

8.6 The design and location of large scale developments and infrastructure proposals impact on the wider setting and significance of historic sites, particularly archaeologically sensitive sites and impact on landscape character. They can also change the character of a place or the setting of historic artefacts and structures.

8.7 It is much more difficult to protect the historic environment and cultural heritage assets which are undesignated but collectively contribute to the distinctiveness of the region or individual places within the region.

8.8 It remains a challenge to keep traditional building skills as a thriving trade and to ensure that there are traditional building training and learning opportunities for new entrants. The shortage of skills contributes to the difficulty owners have in accessing well-informed and appropriately skilled trades to carry out the necessary traditional building work to maintain the region's heritage.

Listed Buildings

8.9 A survey in 1995 revealed that a high number of Listed Buildings had been altered without consent (up to 29% of those examined by photographic record), usually in relation to replacement windows and / or doors. Anecdotally, there is evidence that this trend continues, but no follow up survey has taken place to verify this position. The condition of, and changes to, the interiors of buildings are particularly difficult to assess.

8.10 Some of the historic buildings included in the Statutory List and / or within Conservation Areas are in need of restoration and repair. 121 buildings in Dumfries and Galloway are included in the Buildings at Risk Register for Scotland (BARRS) which is the national record of buildings which are known to be at risk usually due to vacancy and neglect. BARRS includes a mix of Listed Buildings, buildings within Conservation Areas and a small number which are neither. A reduction in the number of buildings included in BARRS can signify a positive outcome through restoration and re-use of a building but it can also indicate a negative outcome through demolition. There are schemes known to be in development or already underway for 15 of the 121 region's buildings included in BARRS.

Conservation Areas

8.11 Of the 36 Conservation Areas, 7 now have formal character appraisals. In combination with changes to permitted development rights within Conservation Areas since 2012, there are more positive policy influences being brought to bear on alterations to the exterior of buildings which require that change preserves or enhances the character of Conservation Areas. In addition there are regeneration and funding initiatives which have just started or are being developed for areas or buildings within three of the region's conservation areas: Stranraer, Annan and Dumfries.

Archaeology

8.12 Details of around 22,500 sites of archaeological and historical interest are recorded in the Dumfries and Galloway Historic Environment Record (HER), which is maintained by the Council, including just over 1,800 maritime records.

8.13 The 32 Archaeological Sensitive Areas have been identified to highlight areas of strategic interest, particularly where large scale land use change is being considered such as commercial forestry planting schemes or windfarms. 21 of these sites are located in rural areas and have a high density of archaeological features or especially identified resources. The other 11 are based on historic settlements.

8.14 There are 1045 nationally important Scheduled Monuments in the region and a further 927 sites that are assessed as potentially meeting the criteria for designation. The region has a relatively high number of designated sites which reflects a high level of archaeological interest over a large area with a low and dispersed population.

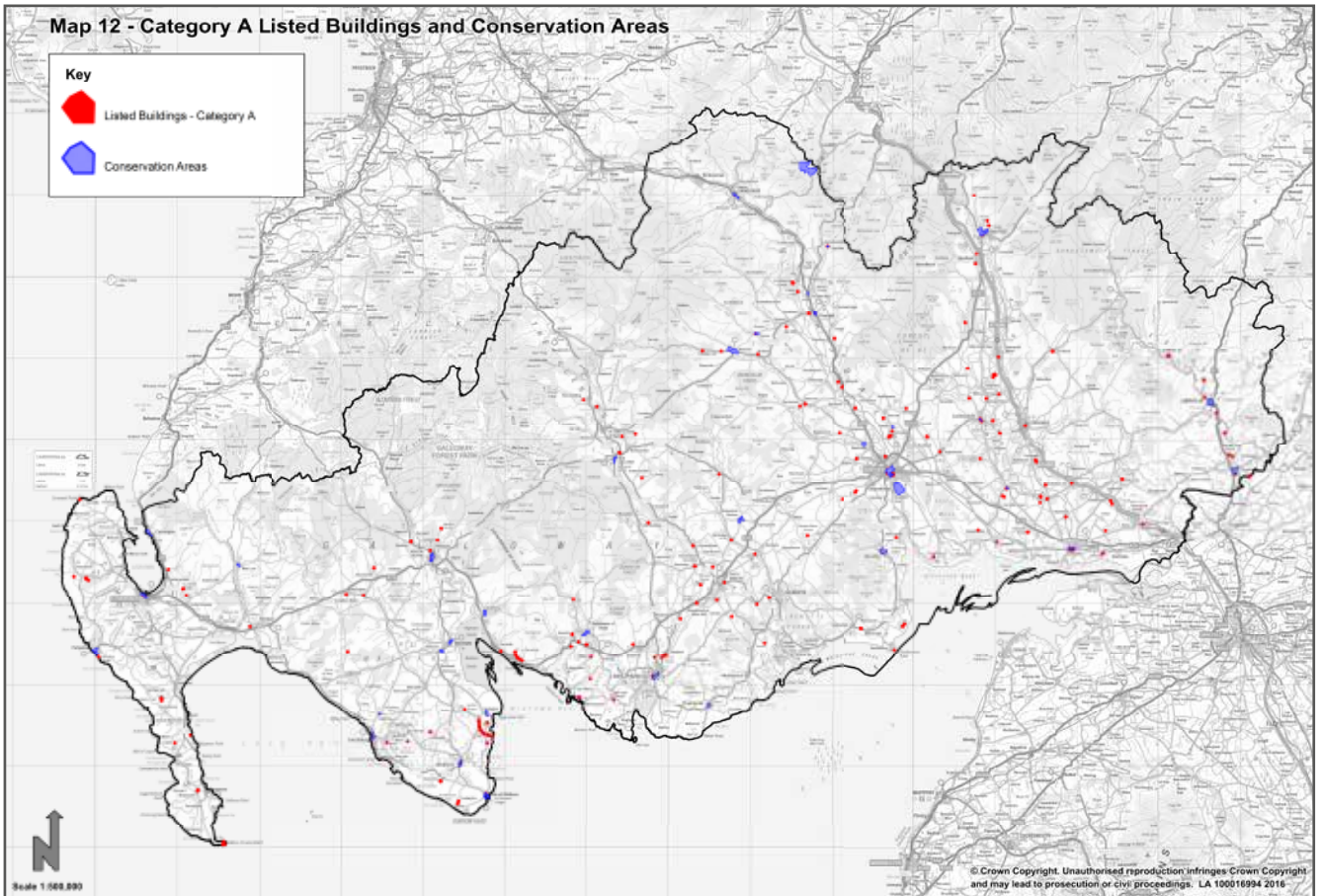
8.15 Although not within the region itself, the UNESCO World Heritage Site at Hadrian's Wall is close to the region's boundaries and the Council would have to take particular care in taking forward developments that may impact on its setting.

Historic Battlefields

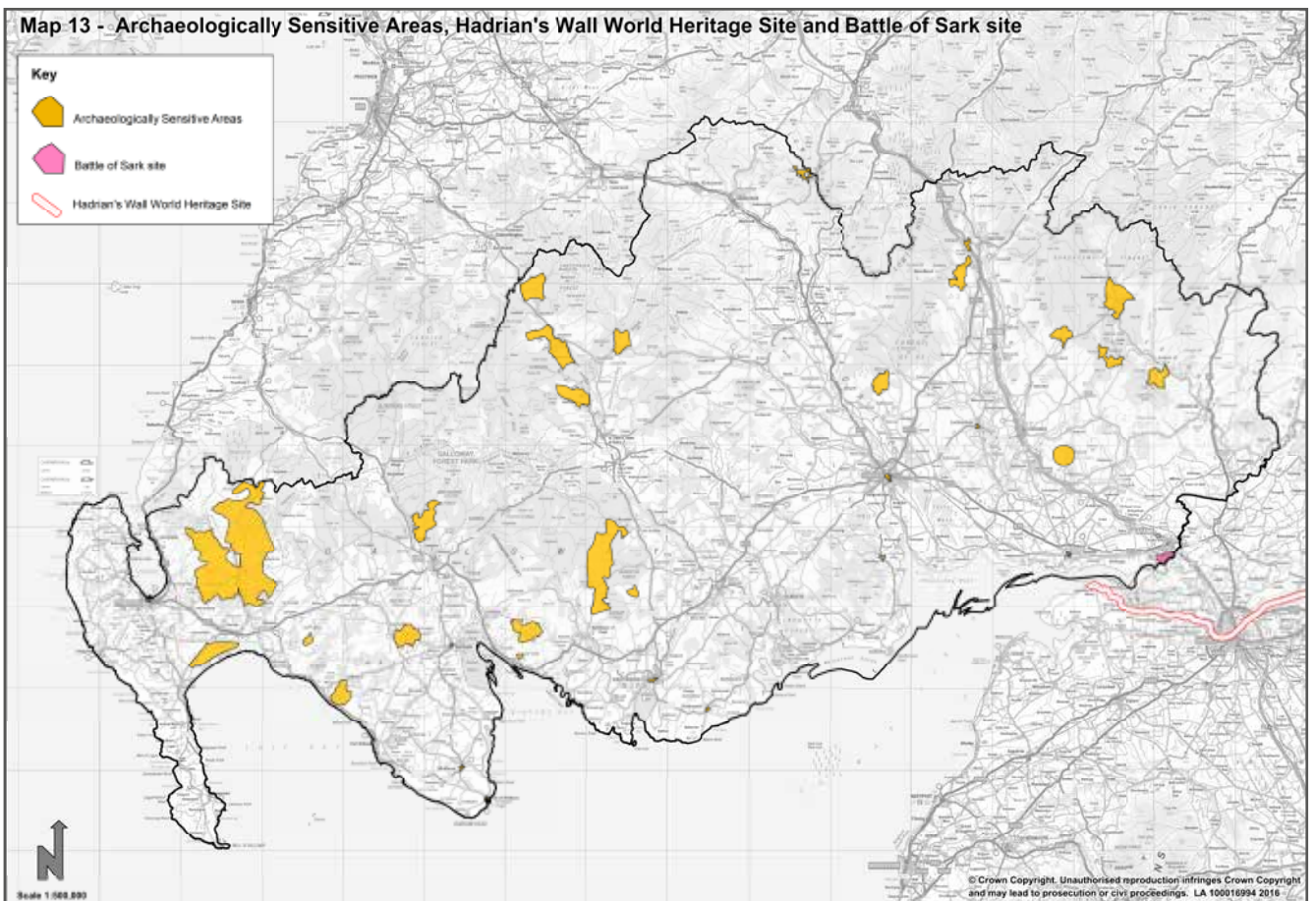
8.16 The site of the Battle of Sark near Gretna has recently been added to the list of Scotland's Inventory of Historic Battlefields in August 2016. The Inventory of Historic Battlefields is a list of nationally important battlefields in Scotland that meet the criteria published in the Scottish Historic Environment Policy 2011. Such sites can be vulnerable to a range of impacts that can diminish their value and potential.

8.17 The locations of the above can be found on Maps 12-15, although please note that only the nationally important Category A Listed Buildings have been mapped for this purpose.

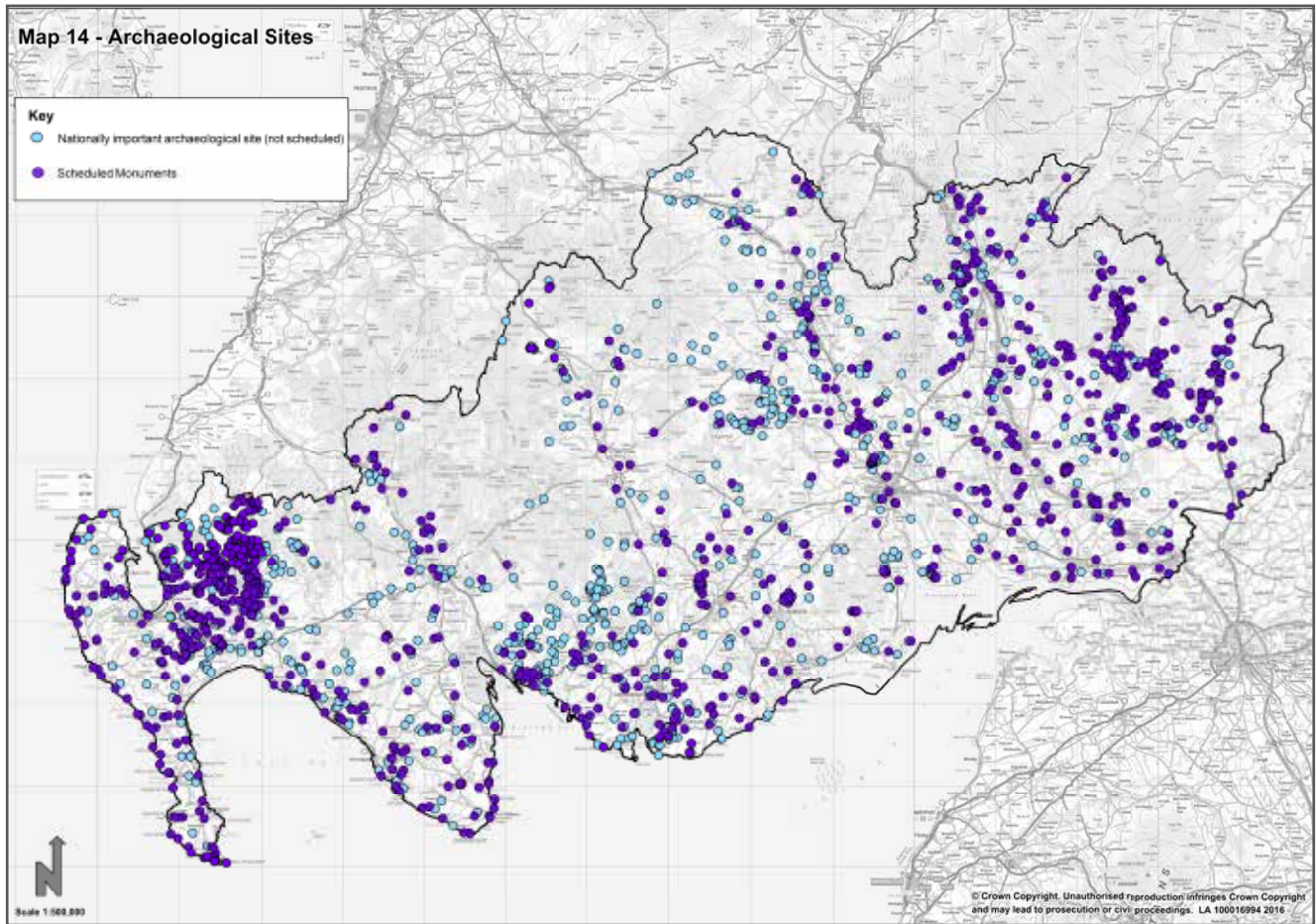
Map 12: Category A Listed Buildings and Conservation Areas



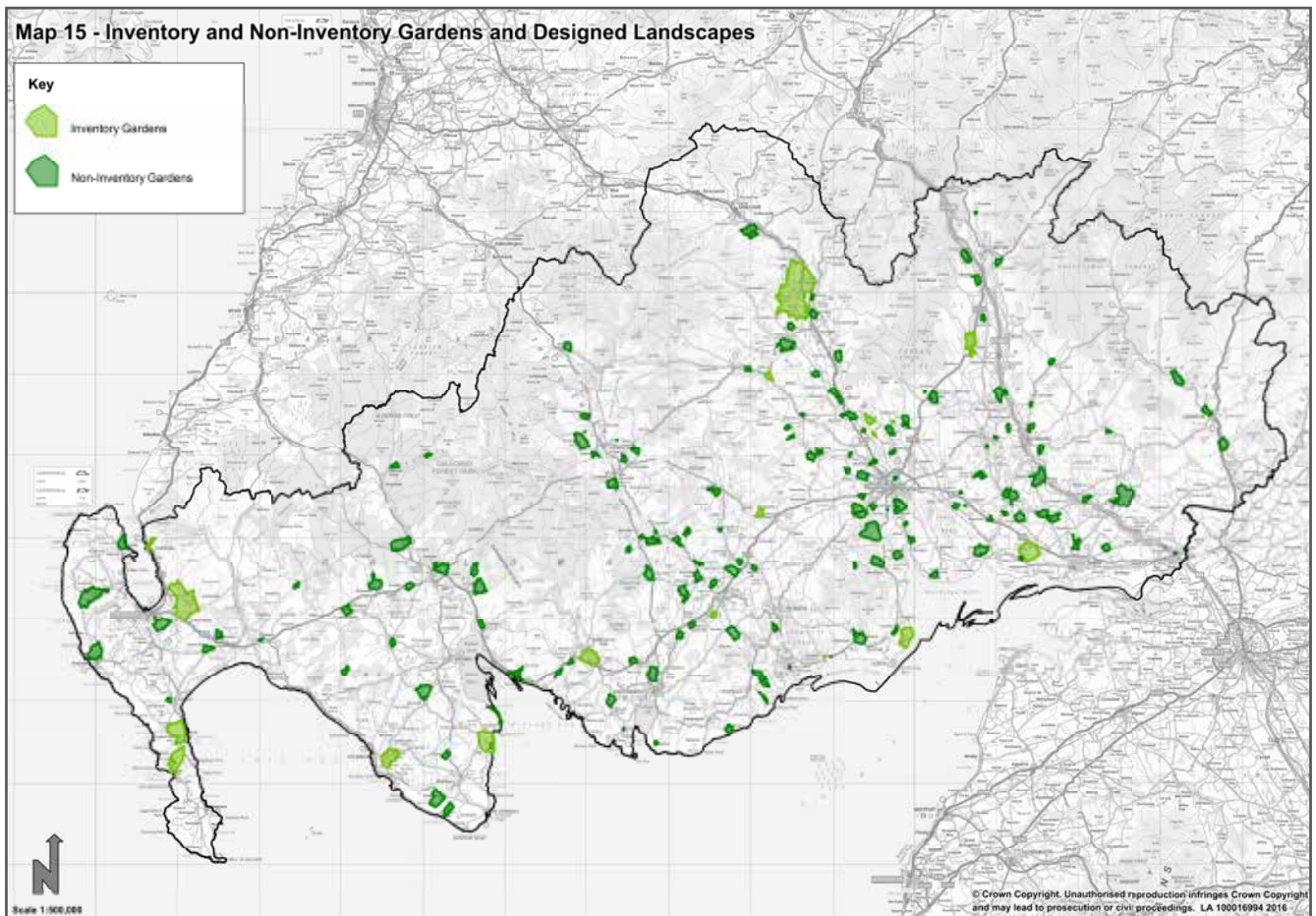
Map 13: Archaeologically Sensitive Areas, Hadrian's Wall World Heritage Site and Battle of Sark Site



Map 14: Archaeological Sites



Map 15: Inventory and Non - Inventory Gardens and Designed Landscapes



9. Landscape

Key issues

- the region has a rich and diverse landscape and includes areas designated for their landscape and scenic qualities at both the national and local levels
- SNH have identified two areas of wildland in the region
- TPO records in the region are limited and require updating
- the loss of larch and ash trees to Phytophthora Ramorum and ash die-back is likely to have a significant impact on region's landscape
- the changing climate is already altering our unique Scottish landscapes

Topic Introduction

9.1 This topic includes natural, rural, urban and urban-rural fringe land as well as inland water and marine areas. Scotland's landscapes make an important contribution to public health and well-being, economic development, biodiversity, active travel and the historic environment. The region has a high quality and diverse landscape which is one of its major assets, providing an attractive environment for both residents and visitors.

9.2 The coastline, which extends to 350 km, stretches from the tidal flats of the Solway Firth in the east, to the sea cliffs of the Mull of Galloway, Scotland's most southerly point. The highest

mountains in southern Scotland and Britain's largest Forest Park (also designated as the UK's first Dark Sky Park) lie to the north within a landscape divided by river valleys that stretch to the coastal plains where they open out into a series of estuaries, bays, inlets and beaches. The rich pattern of farmland between the hills and coast contains many picturesque small towns, villages and over 100 areas of designed landscapes, parkland or gardens. The region's landscape is described in the Dumfries and Galloway Landscape Assessment, which provides guidance on managing change and is currently being reviewed by SNH.

SEA Objectives and Indicators

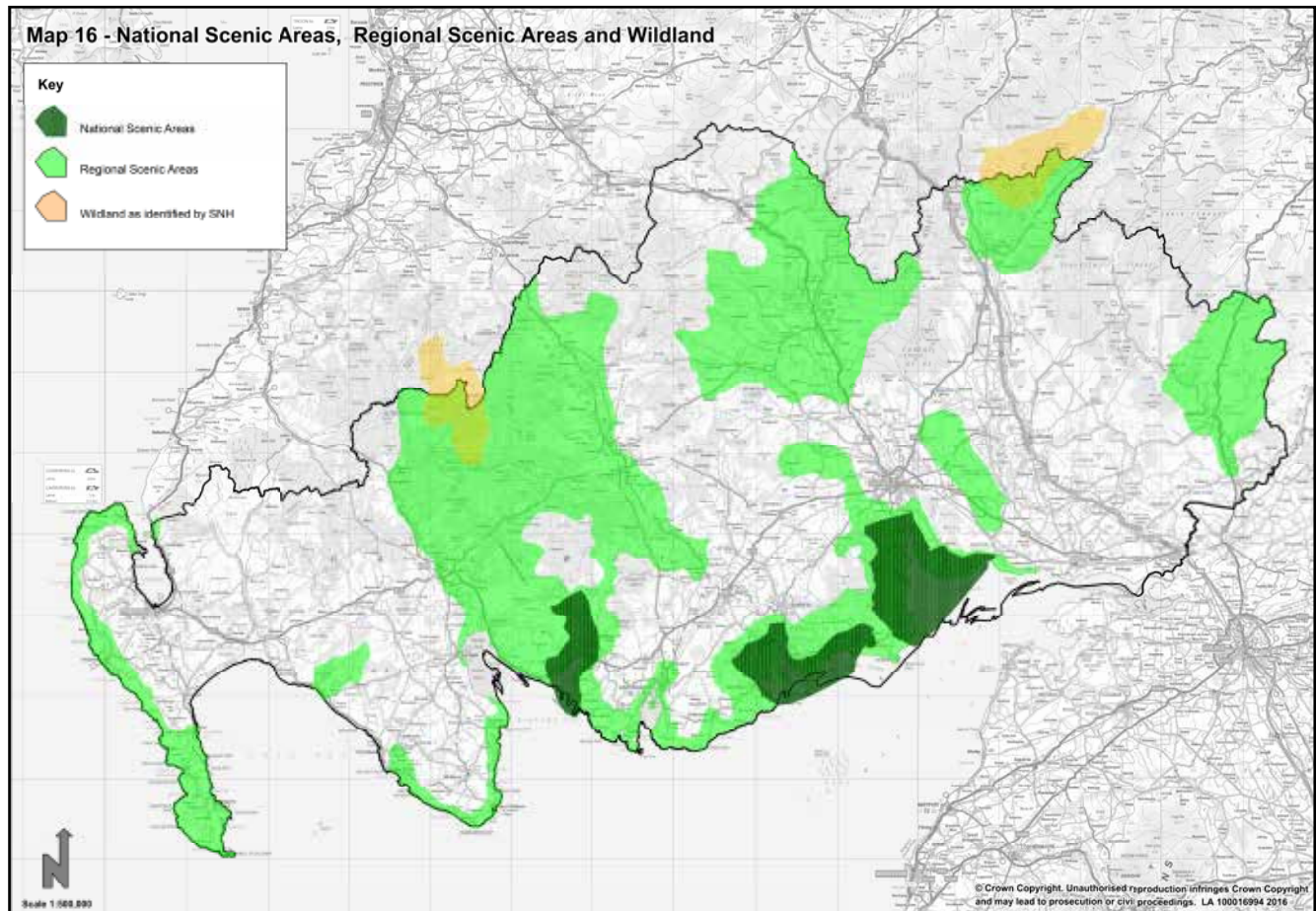
SEA Topic	SEA Objective	Indicators
Landscape	To protect and enhance the character, distinctiveness and diversity of the region's landscape.	Number and condition of designated and non-designated sites Changes in Landscape Character Areas
	To protect and enhance the landscape setting of settlements plus the landscape and scenic qualities of designated landscapes, areas of wild land, and important views	Changes in landscape capacity following study reviews

Data and Trends

9.2 Especially valued landscapes within the region are identified through designations either at the national level as National Scenic Areas (NSAs), of which there are 3, and at the regional level as Regional Scenic Areas (RSAs), of which there are 10. NSAs are recognised as nationally important areas of outstanding scenic qualities, representing

some of Scotland's most interesting and attractive landscapes. The purpose of such designations is to safeguard and enhance their character and appearance. RSAs are locally designated and are areas which are valued regionally or locally for their special scenic qualities. The NSAs and RSAs are shown on Map 16.

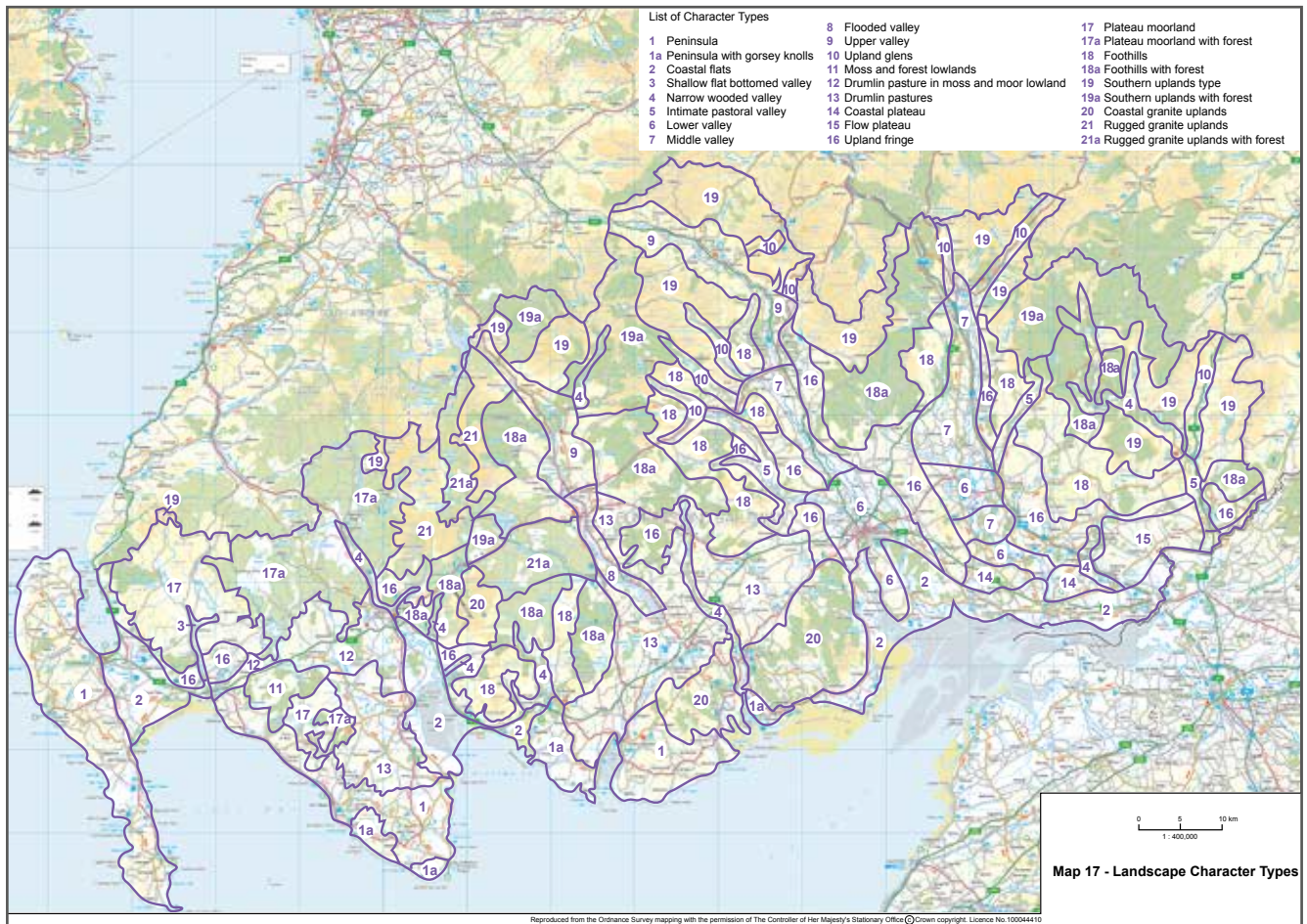
Map 16: National Scenic Areas, Regional Scenic areas and Wildland



9.3 The special qualities, scenic and recreational interests of landscapes across the region are also recognised. This is reflected in the fact that part of the area was a candidate Coastal and Marine National Park in 2007 and is highlighted as a potential National Park by the Scottish Campaign for National Parks and the Association for the Protection of Rural Scotland.

9.4 The Landscape Character Assessment of Dumfries and Galloway identifies four broad regional character areas which are divided into 31 landscape types and subtypes. The current landscape character types are shown in Map 17.

Map 17: Landscape Character Types



9.5 The Dumfries and Galloway Wind Farm Landscape Capacity Study has also been produced to provide specific landscape information in relation to wind energy proposals. The region is experiencing unprecedented levels of landscape change as a result of onshore wind energy development. Consented and operational wind farms affect the Machars moorlands in the west, Carsphairn forest, the Lowther Hills and upper Nithsdale in central areas and Castle O'er Forest in the East. In many cases, this has or will lead to changes in local landscape character. The Council has reviewed the Dumfries and Galloway Wind Farm Landscape Capacity Study to reflect changing baseline conditions, current trends for larger turbines and changes in the way landscape value is considered.

Wild Land

9.6 The region has large areas where human intervention and modern infrastructure are generally absent and these areas exhibit a high

degree of tranquillity, which is an important component of landscape character. SNH has identified two areas within the region considered to be of national importance for their 'wild land' characteristics. These are the Merrick massif and the Talla-Hart fell area to the north east of Moffat shown in Map 16.

Land Use

9.6 Forestry and Woodland account for approximately 31% of land cover in the region. Agriculture accounts for the majority of the remaining land use within the region with an emphasis on dairying and rearing/breeding of beef cattle and sheep resulting in a pastoral landscape.

9.7 The financial viability of upland farms and the loss of existing forestry to wind farm development, coupled with continuing demand for timber, are affecting the land-use balance in upland areas with increasing pressure for new forest planting in previously unplanted areas.

Trees

9.8 Tree Preservation Orders (TPOs) are used to protect trees and woodlands where it is considered to be 'expedient in the interests of amenity' and / or are of cultural or historic interest. Unfortunately, the Council's historic records in respect of TPOs is limited and require updating although there are believed to be approximately 60 TPOs in the region.

9.9 The loss of Larch trees (*Larix sp*) to phytophthora ramorum is having a significant impact on the structure and appearance of conifer plantations. Larch was previously a key 'landscape' tree, used to create seasonal interest, visual contrast and to allow more light / access to popular recreational areas. The Council is working with FCS to encourage Forest Designers to include more open space, using a greater variety of conifers and / or more deciduous trees in their proposals. However, some Forest Design Plans include a high proportion of single-species conifer planting.

9.10 The potential loss of ash trees (*Fraxinus excelsior*) to ash die-back could have a dramatic effect on the region, particularly in settled valleys and coastal locations where ash trees are common along roadsides, burns and field boundaries. There is a moratorium on the movement and planting of new ash trees and this is supported through the development planning process and current DGC Supplementary Guidance.

9.11 The changing climate is already altering our unique Scottish landscape through coastal erosion, flooding and wetter, warmer conditions. As our climate changes, it will create new conditions that may allow existing pests and disease to spread and new threats to become established.

