Department of the Environment
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Northern Ireland Environmental Statistics Report

January 2009

Northern Ireland Statistics & Research Agency

NIEA Northern Ireland Environment Agency
www.ni-environment.gov.uk

Contents

Introduction

Welcome to the first annual Northern Ireland Environmental Statistics Report.

This report is intended to be the first reference point for a range of environmental indicators and will provide annual updates on all of the indicators contained within it. It will be of both public and academic interest and will provide a valuable resource across government in providing links to government strategies.

This report follows on from 'Our Environment, Our Heritage, Our Future: State of the Environment Report for Northern Ireland' which was published by the Northern Ireland Environment Agency (NIEA), formally the Environment & Heritage Service (EHS), in April 2008. The State of the Environment report (SOE) should be referenced for additional context.

The indicators that have been chosen for inclusion in this report, in most instances, complement those that were reported on in the State of the Environment report. Additional indicators have been added, particularly with regard to demographics, environmental pressures and public opinion. Some of the indicators reported in the State of the Environment report have not been continued in this report. This is either because there is no further up-to-date data available, or because the indicator is not suitable for annual updates.

An informal consultation with potential data providers and other interested parties was also used to determine what indicators should and should not be included in the report. This consultation period lasted for approximately 12 weeks from May – August 2008.

In this first report, there are 50 separate data sets, which cover 8 main topics; Demographics & Public Opinion, Air & Climate, Water, Marine, Land, Biodiversity, Built Heritage and Waste. Each of these data sets reports the most recently available data for each indicator, and most provide data on

trends over time and, where applicable, performance against quantified targets.

This report provides some commentary on each of the data sets and describes any trends that they illustrate. There are also links to be found in the appendix of this report which will provide further detail on any of the indicators included in the report.

This report will be updated on an annual basis. Each year the indicators will be reviewed for their usefulness and relevance, and additional indicators will also be considered for future years. Any comments on the indicators currently published or suggestions for future reports will be gladly received and should be forwarded to:

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As this is an environmental publication, no hard copies have been published. However, hard copies and alternative formats are available on request. Such requests should be directed as above.

Statistical Note

This report has been prepared by Central Statistics and Research Branch, Department for Regional Development, along with NIEA.

The name of the department or organisation responsible for providing each series of statistics is shown under the appropriate table. There may be slight discrepancies between totals and the sum of their constituent items due to rounding. The data used are what was available up until November 2008. Any updates after that date will be included in the next report.

The following symbols are used throughout the report:

n/a = not available

0 = nil

Also, where a vertical-dashed line appears in a chart or a horizontal-dashed line appears in a table, this is to indicate a change in methodology.

Acknowledgements

Central Statistics and Research Branch would like to acknowledge the assistance of all those data providers and consultees who participated in the preparation of this report. From colleagues in government departments and agencies, to those in non-departmental public bodies and external organisations, we would like to thank them all for their valued contributions.

1. Demographics & Public Opinion

People and households use up significant levels of resources, such as water, energy, and food, and can exert pressure on the environment. Our lifestyle choices also impact upon the state of the environment. This chapter will look at Northern Ireland's changing population and environmental pressures, as well as our changing attitudes towards the environment.

Northern Ireland's population has been steadily increasing since the early 1970s. In 2001, the population was 5% greater than it had been 10 years previous and almost 10% greater than it was in 1971. The projected population indicates that this trend is estimated to continue over the next 20 - 25 years.

As the population increases, the number of households has also increased. The number of households has increased at a faster rate than the population, as a result the number of people per household is declining.

Environmental pressures such as the way we travel and how often we travel are becoming increasingly important. Air travel has almost doubled in Northern Ireland in the last 10 years with the advent of low-fare airlines a major factor in this. Car travel continues to dominate the way we do most of our day-to-day travelling, with 70% of our journeys being made by car.

The level of public concern for our environment has increased in the last five years with people taking more actions in order to protect the environment. In particular, public concern about climate change has increased dramatically and is now the biggest environmental concern for the Northern Ireland public.

Demographics

Figure 1.1 Northern Ireland population, estimated (1971 – 2001) and projected (2011 – 2031)

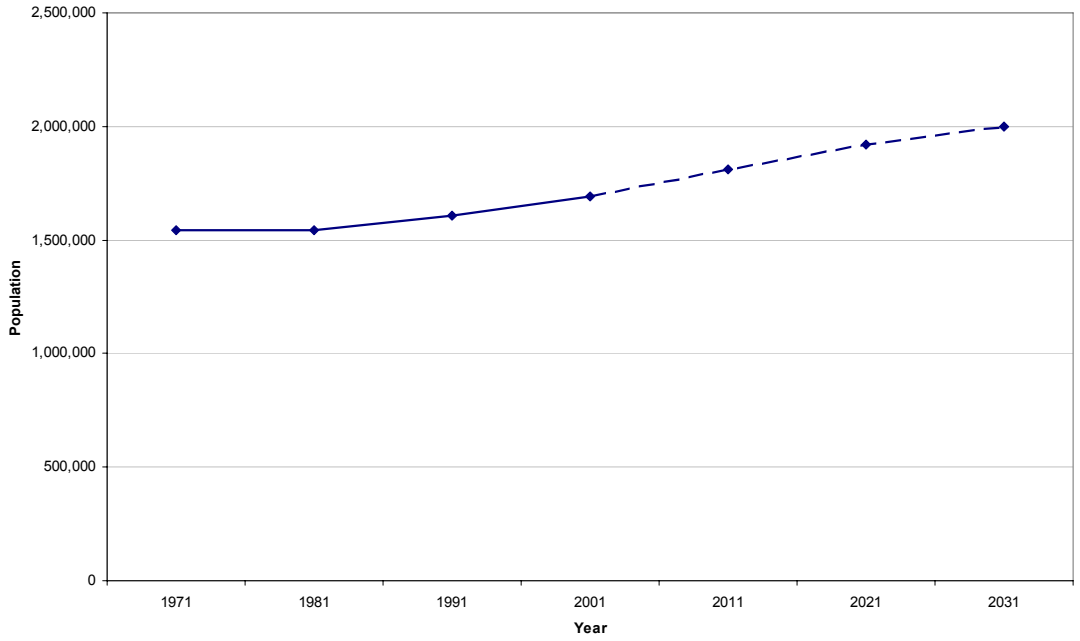


Table 1.1 Northern Ireland population, estimated (1971 – 2001) and projected (2011 – 2031)

						Unit: Population	
	1971	**1981**	**1991**	**2001**	**2011**	**2021**	**2031**
Northern Ireland population	1,540,400	1,543,000	1,607,300	1,689,300	1,811,700	1,921,600	1,999,100
Source: NISRA							

- Northern Ireland population figures, whether estimated or projected are based on the figures collected during the census of population which is carried out every ten years by the Census Office for Northern Ireland.
- The most recent census was carried out in 2001 with the next one scheduled for 2011.
- Between 1971 and 2001, the Northern Ireland population had increased by 10%.
- By 2031, the population is projected to grow by another 18%, to just below 2 million.

Demographics

Figure 1.2 Northern Ireland households, estimated (1971 – 2001) and projected (2011 – 2031)

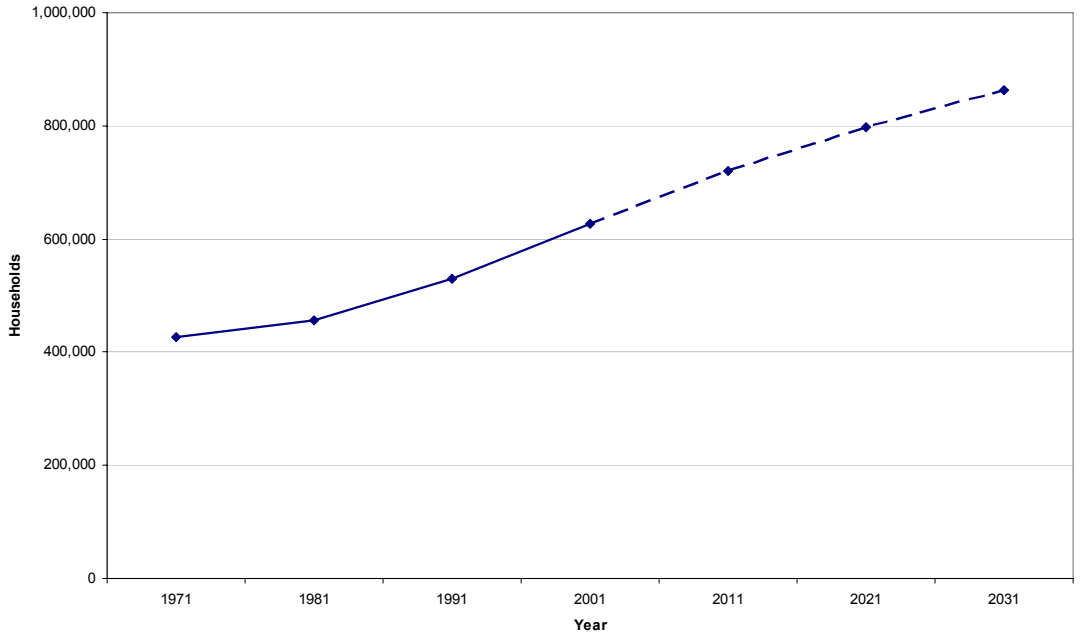


Table 1.2 Northern Ireland households, estimated (1971 – 2001) and projected (2011 – 2031)

						Unit: Households	
	1971	**1981**	**1991**	**2001**	**2011**	**2021**	**2031**
Northern Ireland households	427,434	456,348	530,369	626,718	721,100	798,300	863,200
Source: NISRA							

- The historic data on the number of households in Northern Ireland are taken from the census of population.
- The projected number of households in Northern Ireland is derived using a series of assumptions on household formation and the 2006-based population projections.
- Between 1971 and 2001, the number of households had increased by 47%.
- By 2011, it is projected that there will be more than 90,000 additional households in Northern Ireland than there were in 2001. By 2031, the number of households in Northern Ireland is projected to increase by 38% on 2001 figures.

Environmental Pressures

Figure 1.3 Northern Ireland airport passenger numbers, 1998 – 2007

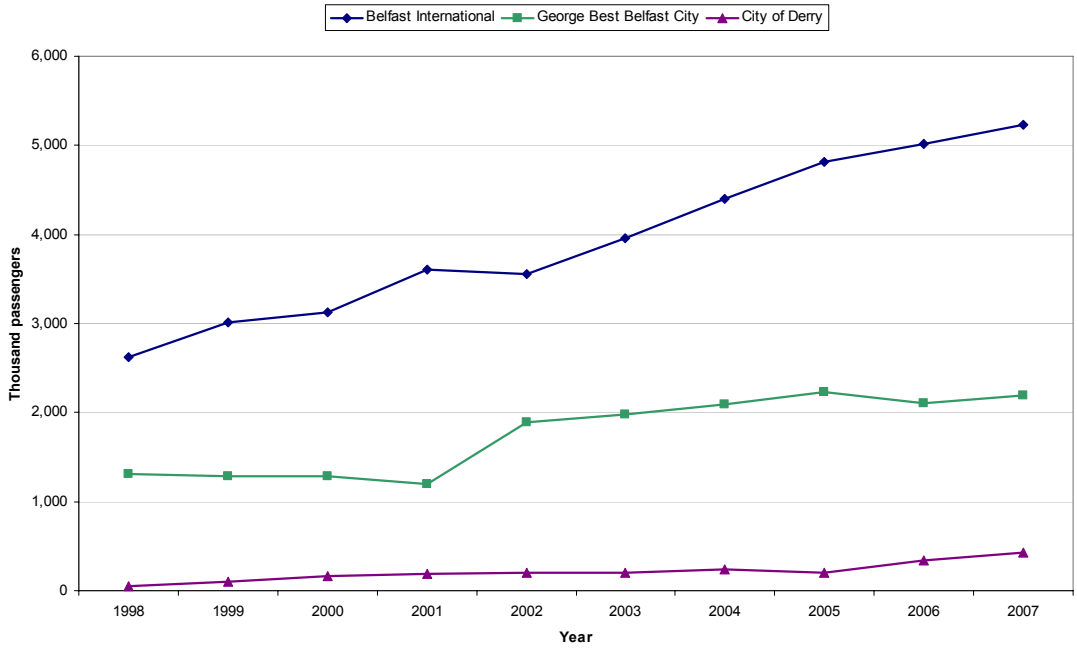


Table 1.3 Northern Ireland airport passenger numbers, 1998 – 2007

								Unit: Thousand passengers		
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Belfast International	2,627	3,012	3,128	3,603	3,551	3,954	4,403	4,820	5,015	5,236
George Best Belfast City	1,314	1,282	1,290	1,192	1,890	1,974	2,091	2,237	2,106	2,187
City of Derry	49	104	163	188	199	206	234	199	342	428
All Airports	**3,990**	**4,398**	**4,581**	**4,983**	**5,640**	**6,134**	**6,728**	**7,256**	**7,463**	**7,851**
Source: Civil Aviation Authority										

- Northern Ireland's airports continue to handle increasing numbers of passengers each year.
- Since 1998, airport passenger numbers have almost doubled in Northern Ireland, increasing from approximately 4 million in 1998 to just under 8 million in 2007.
- The number of airport passengers at Belfast International has doubled in the last 10 years, from 2.6 million in 1998 to 5.2 million in 2007.
- In 2007, Belfast International accounts for approximately two-thirds of all airport passengers in Northern Ireland, with George Best Belfast City accounting for 28% of all airport passengers.

Environmental Pressures

Figure 1.4 Numbers of journeys per person by mode of transport, 2001-03 – 2005-07

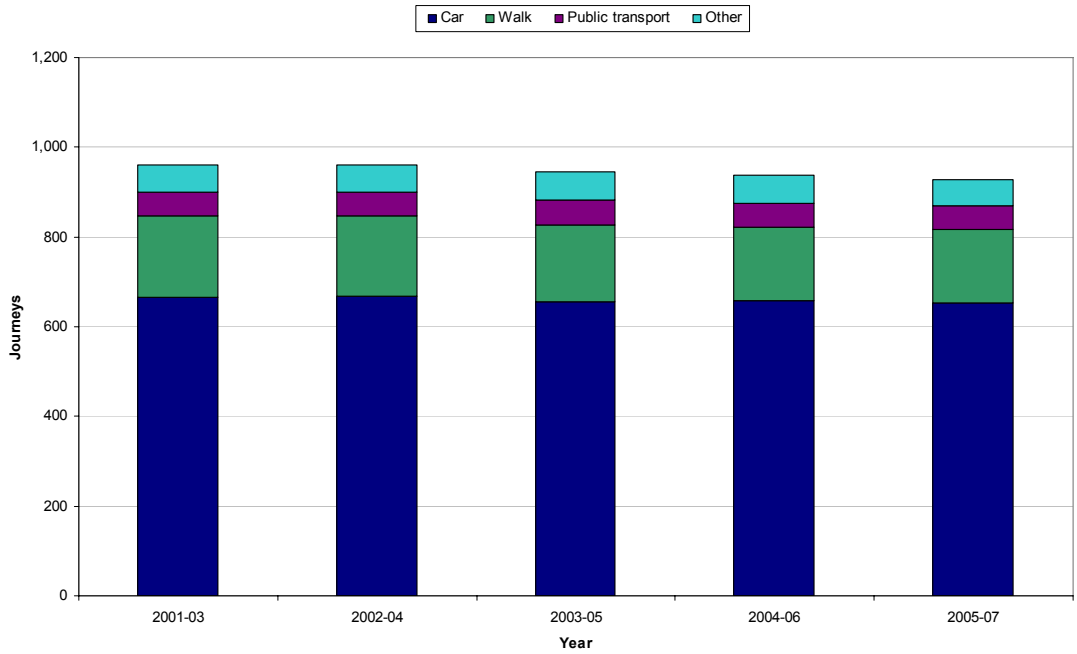


Table 1.4 Numbers of journeys per person by mode of transport, 2001-03 – 2005-07

				Unit: Journeys	
	2001-03	**2002-04**	**2003-05**	**2004-06**	**2005-07**
Car	665	668	655	657	654
Walk	182	179	172	165	164
Public transport	54	54	55	54	51
Other	60	60	63	62	59
All modes (3 year average)	**960**	**963**	**947**	**937**	**929**
Source: Travel Survey for Northern Ireland, DRD					

- There has been little change in the pattern of the number of journeys made by mode of transport, with the average number of journeys per person between 2005 and 2007 being 929.
- On average, between 2005 and 2007, 70% of all journeys were made by car, either driving the car or as a passenger. This has not changed significantly over the course of the last 5 surveys.
- In the same period, 18% of all journeys made were by walking.
- Public transport only accounts for 5.5% of all journeys made in the same 3-year period.

Environmental Pressures

Figure 1.5 Average distance travelled per person by mode of transport, 2001-03 – 2005-07

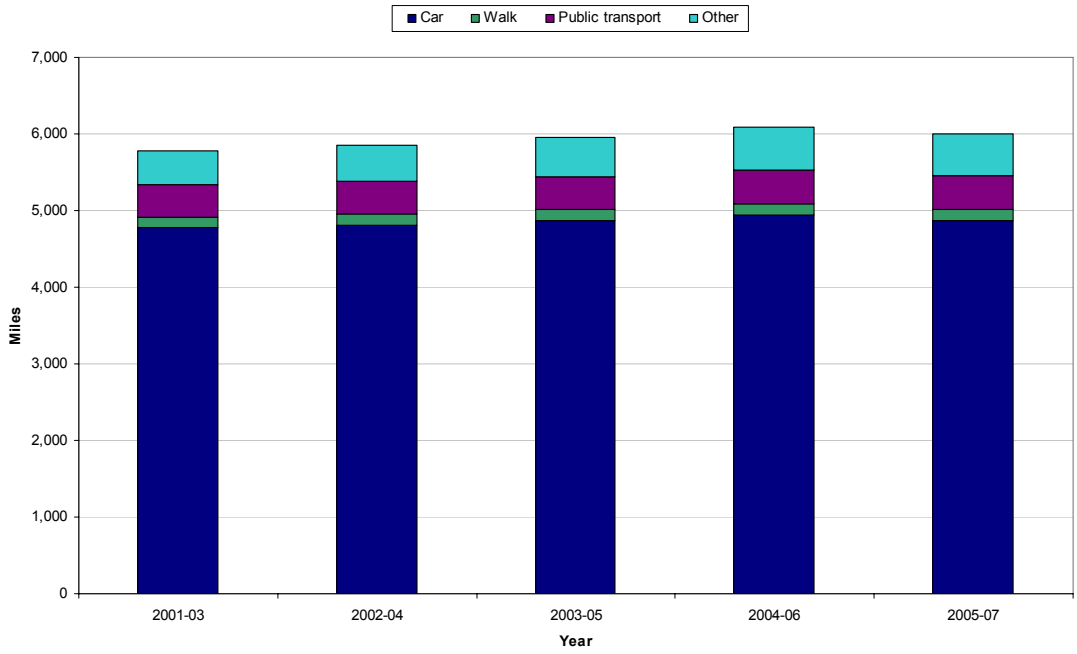


Table 1.5 Average distance travelled per person by mode of transport, 2001-03 – 2005-07

					Unit: Miles
	2001-03	**2002-04**	**2003-05**	**2004-06**	**2005-07**
Car	4,777	4,816	4,870	4,943	4,864
Walk	142	137	139	138	144
Public transport	426	429	431	446	442
Other	441	477	509	567	549
All modes (3 year average)	**5,786**	**5,861**	**5,951**	**6,094**	**5,999**
Source: Travel Survey for Northern Ireland, DRD					

- Between 2005 and 2007, the average distance travelled per person each year was almost 6,000 miles.
- Car travel made up just over four-fifths (81%) of the total distance travelled.
- People travelled on average 144 miles per year by walking, just 2% of the total distance travelled.
- Public transport accounted for 7% of the total distance travelled each year.

Public Opinion

Figure 1.6 Level of concern for the environment, 2003/04 – 2007/08

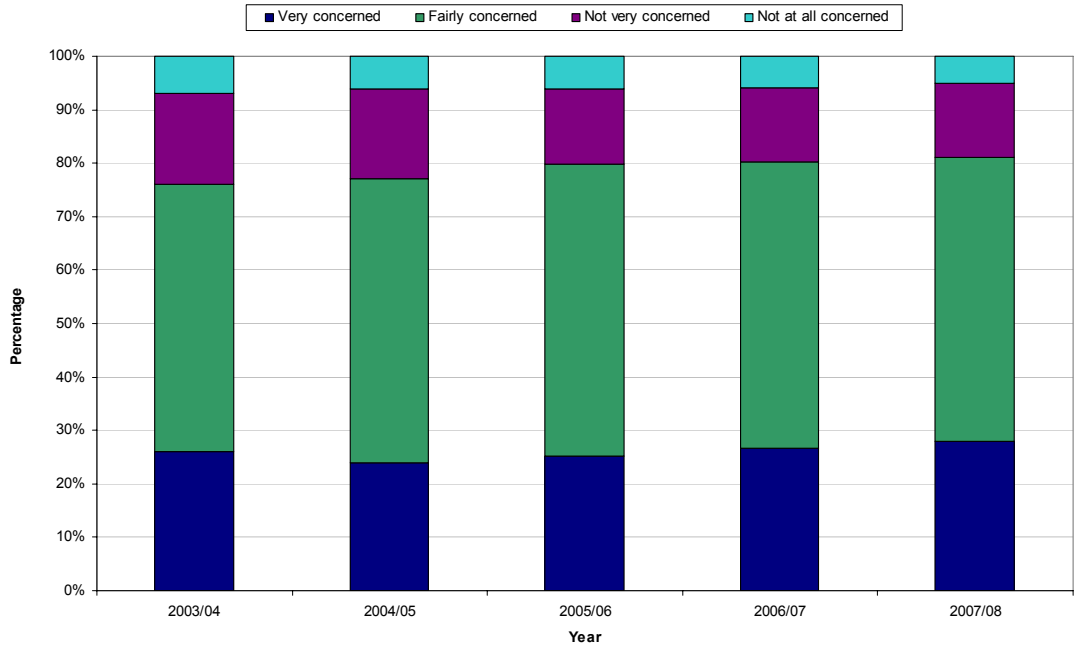


Table 1.6 Level of concern for the environment, 2003/04 – 2007/08

				Unit: Percentage	
	2003/04	**2004/05**	**2005/06**	**2006/07**	**2007/08**
Very concerned	26	24	25	27	28
Fairly concerned	50	53	54	54	53
Not very concerned	17	17	14	14	14
Not at all concerned	7	6	6	6	5
All Households	**2,528**	**2,761**	**2,586**	**2,686**	**2,559**
Source: Continuous Household Survey, NISRA					

- Members of the public were asked to provide their views on environmental issues in NISRA's Continuous Household Survey (CHS).

- There was a significant increase in the number of people who are either very concerned or fairly concerned about the environment between 2003/04 and 2005/06. From then on the figures are not significantly different.

- In 2003/04, 76% of people were very or fairly concerned about the environment. By 2007/08, this figure had increased to 81%.

Public Opinion

Table 1.7 Types of environmental concern, 2003/04 – 2007/08

				Unit: Percentage	
	2003/04	**2004/05**	**2005/06**	**2006/07**	**2007/08**
Pollution in rivers	30	30	30	29	28
Pollution in bathing waters and beaches	21	23	23	23	22
Traffic exhaust fumes and urban smog	35	33	32	32	31
Loss of plants and animals in Northern Ireland	13	15	15	15	16
Ozone layer depletion	22	26	27	27	24
Tropical forest destruction	9	8	10	12	13
Climate change	13	19	29	34	39
Loss of trees and hedgerows in Northern Ireland	16	17	15	16	16
Fumes and smoke from factories	14	16	15	14	13
Traffic congestion	27	28	26	28	30
Use of pesticides and fertilisers	17	16	18	15	13
Acid rain	3	2	2	3	2
Household waste disposal	31	33	34	33	34
Noise	7	7	6	6	5
None of these	8	9	5	4	5
Other	1	2	2	1	1
All Households	**2,718**	**2,766**	**2,594**	**2,675**	**2,562**
Source: Continuous Household Survey, NISRA					
Note: Base does not equal 100% - Multiple responses permitted					

- Members of the public were asked to provide their views on what were their three main environmental concerns in NISRA's Continuous Household Survey (CHS).

- Results show that in 2007/08, the three main environmental concerns for Northern Ireland residents were climate change (39%), household waste disposal (34%) and traffic exhaust fumes and urban smog (31%).

- Over the last five years of the survey, climate change has become a significantly bigger concern. In 2007/08, 39% of people mentioned climate change compared with 13% of people in 2003/04.

- Traffic congestion, pollution in rivers, ozone layer depletion and pollution in bathing waters and beaches are all mentioned by more than 20% of people as one of their three most important environmental concerns.

Sustainability of Lifestyle

Table 1.8 Actions taken to protect the environment, 2003/04 – 2007/08

				Unit: Percentage	
	2003/04	**2004/05**	**2005/06**	**2006/07**	**2007/08**
Reduced amount of energy used in home	26	26	31	37	40
Reduced amount of water used in home	22	24	27	30	31
Used public transport for environmental reasons	16	16	16	18	18
Reduced the use of the car	17	19	18	19	19
Took action to protect wildlife	31	33	33	30	31
Recycled paper, glass	35	33	32	32	34
Not bought something because of packaging	9	9	10	11	13
Bought organic food	25	24	26	26	28
Used energy saving light bulbs	41	42	43	47	51
All Households	**2,535**	**2,768**	**2,592**	**2,687**	**2,560**
Source: Continuous Household Survey, NISRA					
Note: Base does not equal 100% - Multiple responses permitted					

- Members of the public were asked what actions they had taken in the last 12 months to protect the environment in NISRA's Continuous Household Survey (CHS).

- Results indicate that in 2007/08, the most common actions taken by individuals to protect the environment were using energy saving light bulbs (51%), reducing the amount of energy used in the home (40%) and recycling paper and glass (34%).

- Over the last five years, reducing the amount of energy used in the home, reducing the amount of water used in the home, using energy saving light bulbs and not buying something because of the packaging have all increased significantly.

2. Air & Climate

The air that we breathe is vital to our health and wellbeing. Good air quality is essential for human health, the climate, habitats and the built environment. Pollutants from human activity are present in our atmosphere and depending on their levels, they may adversely impact our health and natural environment. This chapter will report on the quality of our air, on greenhouse gas emissions, renewable energy, environmental installations and the climate.

There are more than 30 air quality monitoring stations in Northern Ireland. Levels of carbon monoxide, nitric oxides, sulphur dioxide, particles, ozone, benzene, 1,3-butadiene and polycyclic aromatic hydrocarbons are monitored across a range of these.

Northern Ireland's air quality has shown substantial improvement in recent years, with most measures well within the national air quality objectives. In particular, levels of pollutants associated with coal and oil combustion have reduced over the past decade.

Weather conditions can be a contributing factor to some periods of poor air quality and subsequent elevated levels. This is true of hot, sunny weather which can lead to higher levels of ozone, and winter weather where temperature inversions can lead to increased pollutant levels at ground level.

Greenhouse gas emissions in Northern Ireland have decreased slightly since 1990, with a 6% fall in emissions achieved by 2006. The Sustainable Development Strategy has a target of a 25% decrease in greenhouse gas emissions by 2025. Greenhouse gas emissions are calculated annually, with revisions made for previous years.

Climate change is of increasing concern to the Northern Ireland public, and some of the climate records for Northern Ireland do suggest that the average temperature in Northern Ireland has increased since the start of the 20th century. There is also some evidence of changing seasonal distribution of our rainfall with the proportion of annual rainfall falling in winter increasing, while summer rainfall has been decreasing since records began in 1930.

Nitrogen Oxides

Figure 2.1 Annual mean concentration of nitrogen dioxide (NO_2), 1998 – 2007

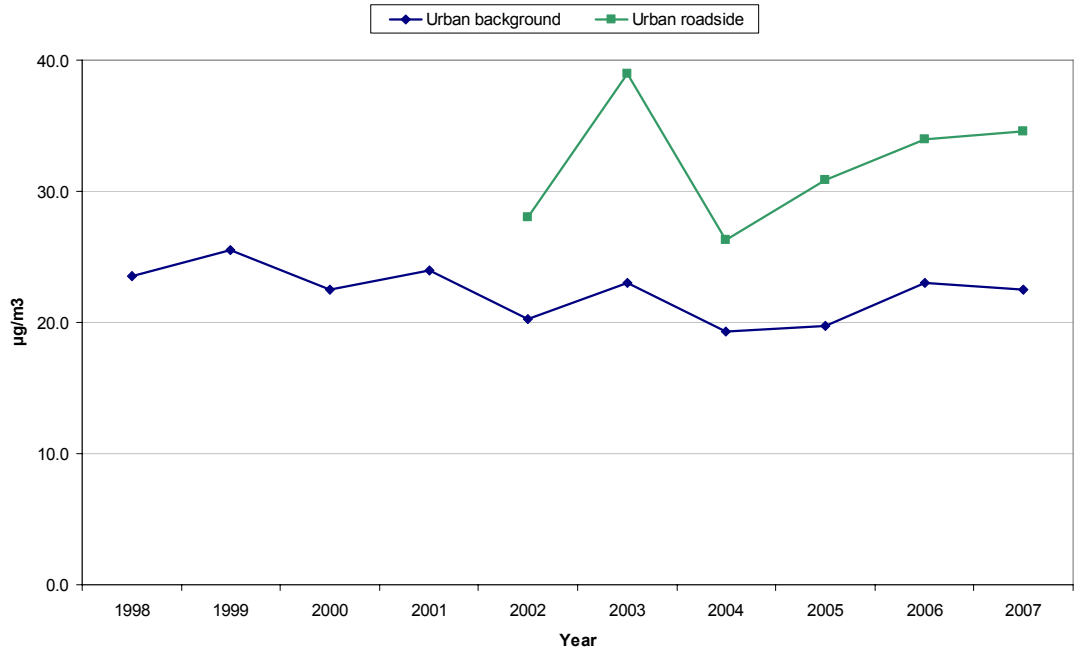


Table 2.1 Annual mean concentration of nitrogen dioxide (NO_2), 1998 – 2007

Unit: µg/m^3

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Urban background	23.5	25.5	22.5	24.0	20.3	23.0	19.3	19.7	23.0	22.5
Urban roadside	n/a	n/a	n/a	n/a	28.0	39.0	26.3	30.9	34.0	34.6

Source: AEA Technology

- Nitrogen dioxide is monitored using automatic techniques at 15 urban sites across Northern Ireland.
- The annual mean background concentration of NO_2 for Northern Ireland has been below 25µg/m^3 since the year 2000. This average is well within the National Air Quality objective for NO_2 of 40µg/m^3.
- The annual average concentrations of NO_2 in urban areas have been generally declining over the long term. This is due primarily to the increased use of catalytic converters in cars and a move from domestic coal burning to gas heating.
- In the last 10 years, the background level of NO_2 in urban areas has remained relatively stable, but the roadside levels, which have been monitored since 2002, have been more variable.

Particulate Matter

Figure 2.2 Urban and rural annual mean particulate matter of less than 10 microns, 1998 – 2007

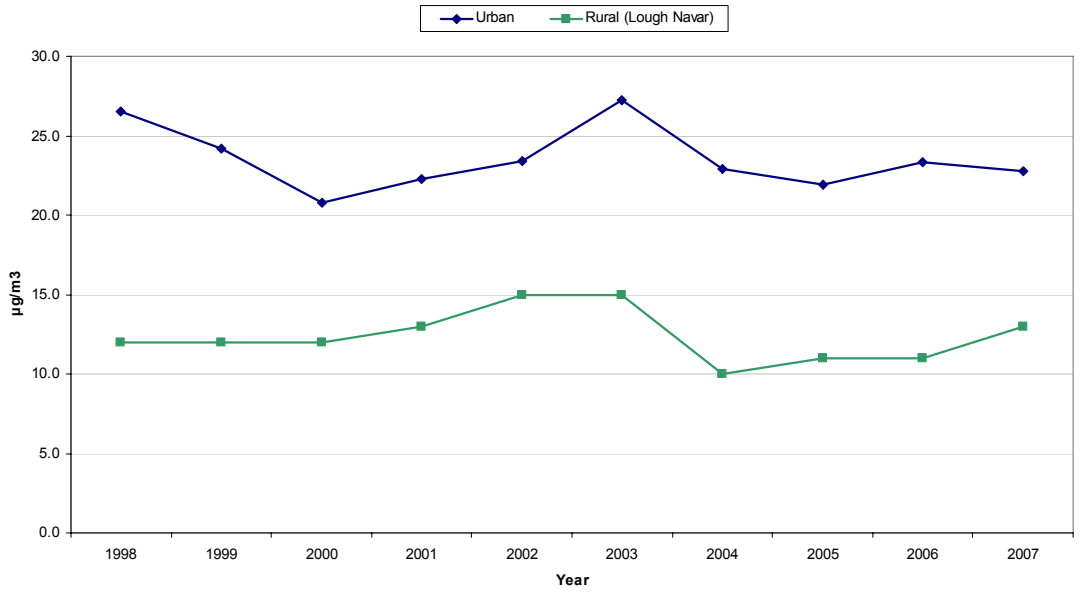


Table 2.2 Urban and rural annual mean particulate matter of less than 10 microns, 1998 – 2007

Unit: µg/m^3

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Urban	26.5	24.2	20.8	22.3	23.4	27.2	22.9	21.9	23.3	22.8
Rural (Lough Navar)	12.0	12.0	12.0	13.0	15.0	15.0	10.0	11.0	11.0	13.0

Source: AEA Technology

- Particulate matter in the atmosphere with a diameter of less than or equal to 10 microns (PM_{10}) arises from both man made and natural sources. Road transport and fossil fuel combustion produce the majority of particulate matter found in urban locations.

- In 2007, the annual mean concentration of PM_{10} in urban areas was 22.80µg/m^3 and at the Lough Navar rural background monitoring site, it was 13.0µg/m^3.

- In the last ten years, the rural concentration of PM_{10} has been no higher than 15µg/m^3 and the urban concentration has been less than 28µg/m^3.

- All the readings in the last 10 years have been well below the 40µg/m^3 level that has been set out as the UK Air Quality objective for the protection of human health for PM_{10}.

Air Quality Trends

Figure 2.3 Average number of days per year of moderate or worse air quality, 1998 – 2007

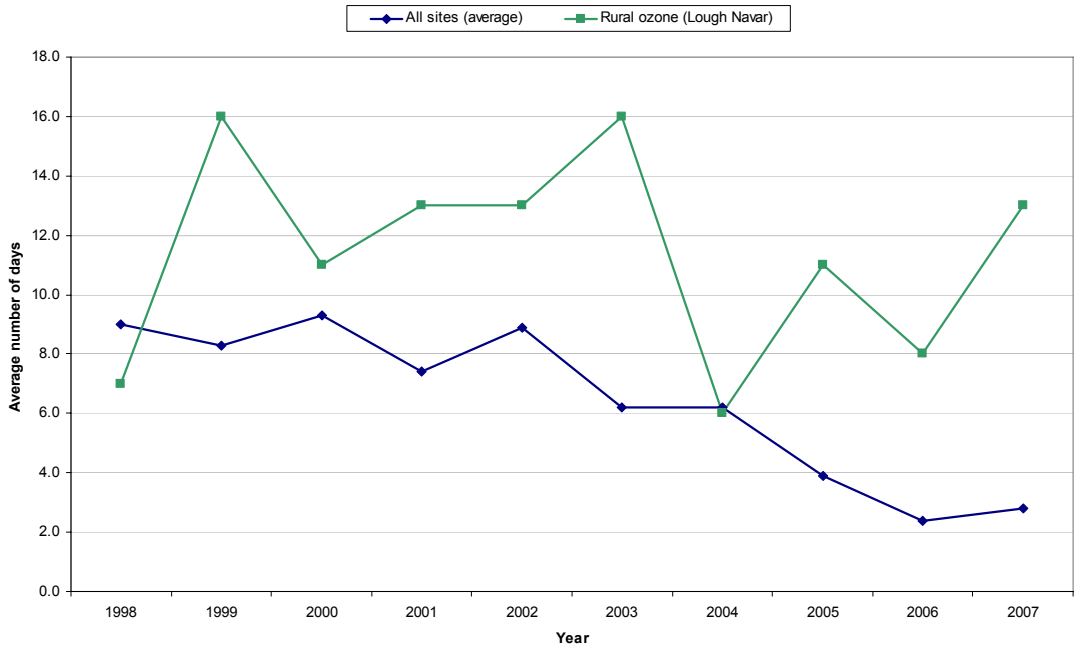


Table 2.3 Average number of days per year of moderate or worse air quality, 1998 – 2007

								Unit: Average number of days		
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
All sites (average)	9.0	8.3	9.3	7.4	8.9	6.2	6.2	3.9	2.4	2.8
Rural ozone (Lough Navar)	7.0	16.0	11.0	13.0	13.0	16.0	6.0	11.0	8.0	13.0
Source: AEA Technology										

- The average number of days of moderate or worse air quality in 2007 was 2.8 days across all sites, and 13 days at the Lough Navar rural background site.

- The average number of days of moderate or worse air quality across all sites in Northern Ireland has decreased in the last ten years from 9 days in 1998 to 2.8 days in 2007.

- In general, there has been a long term decline in the average number of air pollution days in Northern Ireland. This is largely because of a reduction in emissions of particles and sulphur dioxide, but deviations from this trend may be seen in certain years, for example in 2003, due to particular weather characteristics.

Ground Level Ozone

Figure 2.4 Urban and rural annual ozone exceedences, 1998 – 2007

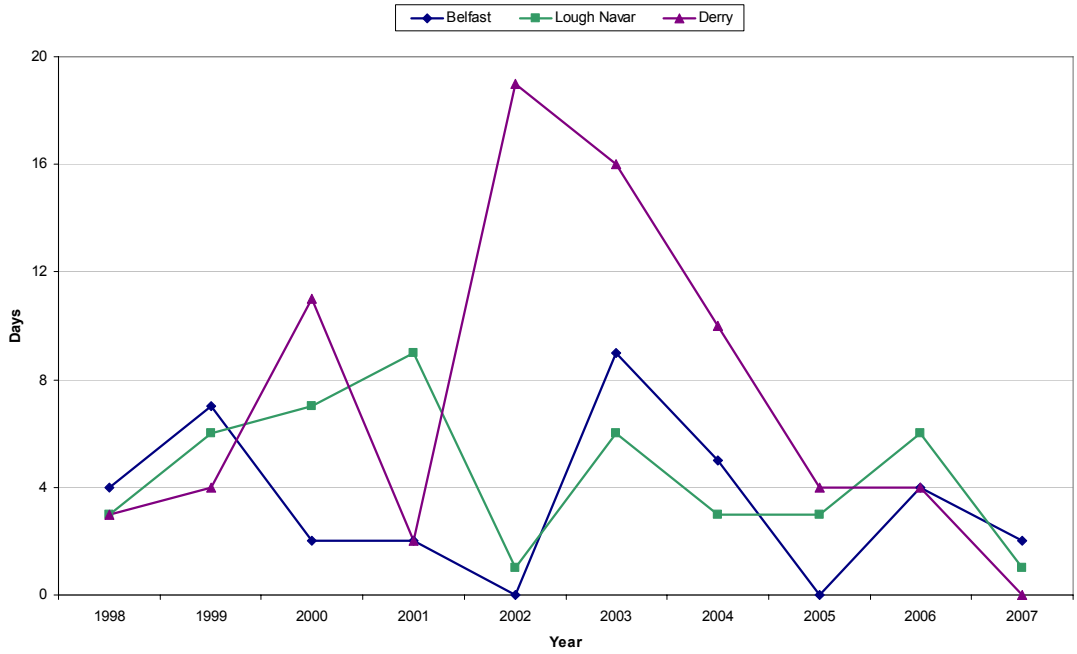


Table 2.4 Urban and rural annual ozone exceedences, 1998 – 2007

Unit: Days

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Belfast	4	7	2	2	0	9	5	0	4	2
Lough Navar	3	6	7	9	1	6	3	3	6	1
Derry	3	4	11	2	19	16	10	4	4	0

Source: AEA Technology

- Ozone is monitored using automatic sites at Belfast, Londonderry and Lough Navar.
- The National Air Quality Strategy sets an objective for a daily maximum eight hour running mean of 100µg/m^3 ozone not to be exceeded more than 10 times per year.
- Unlike some other pollutants, levels of ozone in Northern Ireland do not appear to be decreasing, but remain variable from year to year, depending on weather conditions. Therefore, ozone exceedences remain a possibility.
- The objective has not been exceeded in Belfast or Lough Navar in the last ten years, but has been exceeded in Derry in four of the last ten years.

Ammonia

Figure 2.5 Annual mean ammonia emissions from agriculture, 1998 – 2007

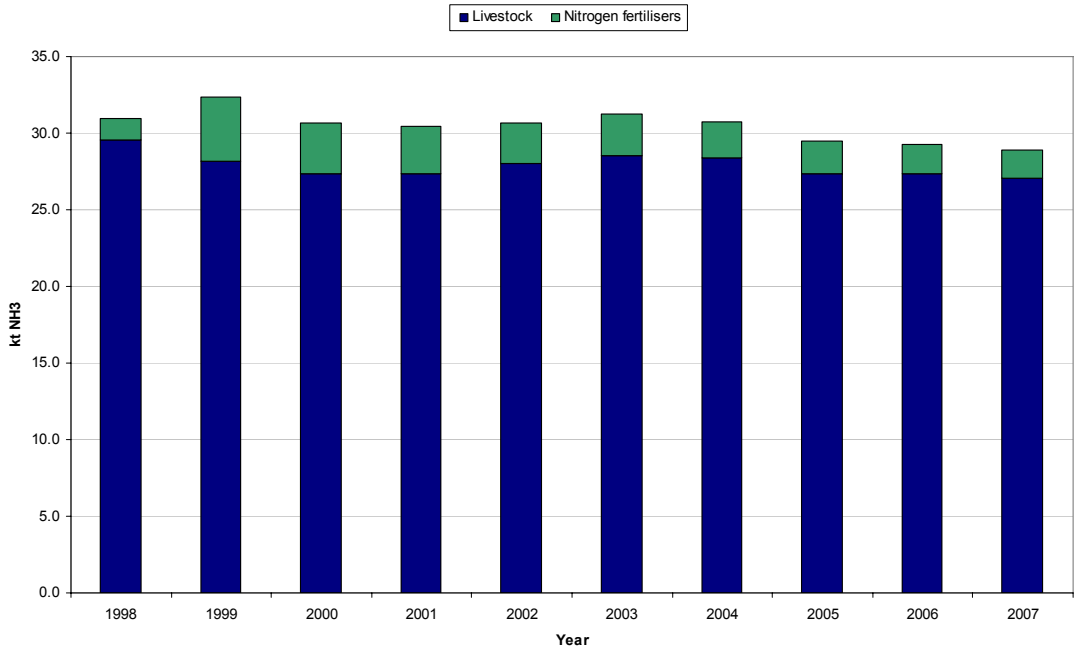


Table 2.5 Annual mean ammonia emissions from agriculture, 1998 – 2007

									Unit: kt NH_3	
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Livestock	29.5	28.2	27.3	27.4	28.0	28.6	28.4	27.3	27.3	27.1
Nitrogen fertilisers	1.4	4.2	3.3	3.1	2.7	2.7	2.3	2.1	1.9	1.9
Total agriculture	**30.9**	**32.4**	**30.7**	**30.5**	**30.7**	**31.3**	**30.7**	**29.5**	**29.3**	**28.9**
Source: North Wyke Research										

- Ammonia is an air pollutant mainly associated with agricultural practices.
- Estimates of total ammonia emissions are based on numbers of cattle, sheep, pigs, poultry, horses, goats, deer and the use of fertilisers.
- Ammonia emissions from agriculture have remained fairly constant in the last 10 years, with only a 2kt decrease since 1998. This equates to a 6% decrease in that time period.
- Of the ammonia emissions from agriculture in 2007, 94% is derived from livestock, and only 6% from the application of fertilisers containing nitrogen.

Greenhouse Gas Emissions

Figure 2.6 Total greenhouse gas emissions, 1998 – 2006

Table 2.6 Total greenhouse gas emissions, 1990 – 2006

									Units: kt CO_2 equivalent		
	1990	**1995**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Total GHG emissions	23,851	24,255	23,273	23,338	22,787	23,000	21,120	20,960	20,902	21,553	22,461
Source: AEA Technology											

- Greenhouse gas emissions for England, Scotland, Wales and Northern Ireland are published annually, detailing estimates of greenhouse gas emissions since 1990. The estimates are consistent with the United Nations Framework Convention on Climate Change reporting guidelines.

- In 2006, Northern Ireland's total greenhouse gas emissions were 22,461 ktCO_2 equivalent, which accounted for 3.4% of the UK total.

- Since 1990, Northern Ireland's total greenhouse gas emissions have decreased by 5.8%. This is less than the reduction seen for the UK as a whole, which has seen a decrease of 15.7% on 1990 levels.

- In May 2006, the Office of the First Minister and Deputy First Minister (OFMDFM) published the Sustainable Development (SD) Strategy which set a target for a 25% decrease in Northern Irelands total greenhouse gas emissions by 2025.

Greenhouse Gas Emissions

Figure 2.7 Total greenhouse gas emissions by sector, 1990 & 2006

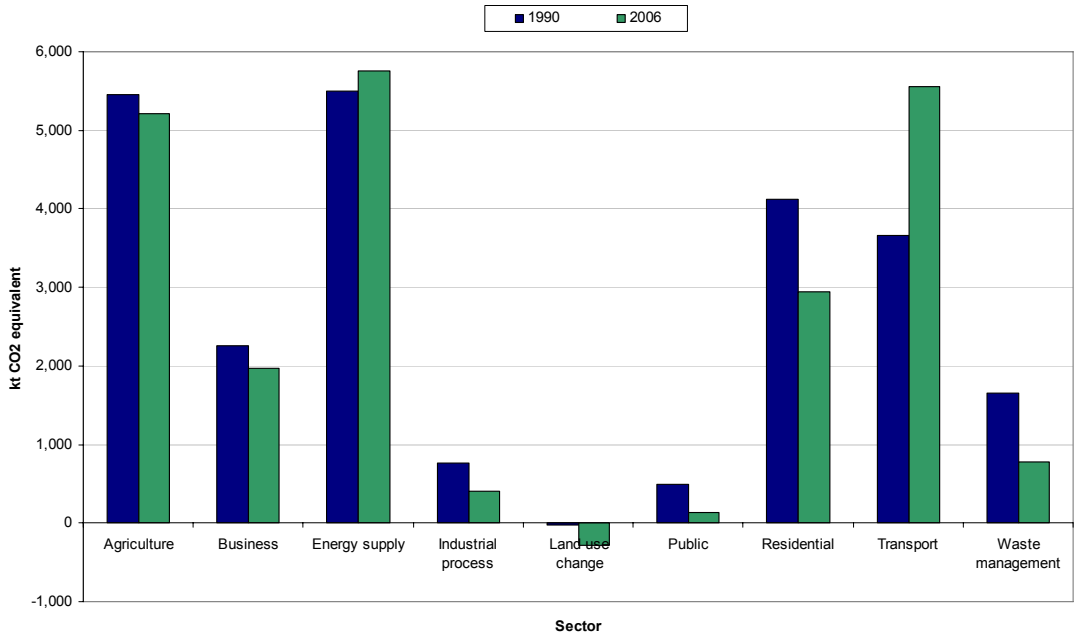


Table 2.7 Total greenhouse gas emissions by sector, 1990 & 2006

									Units: kt CO_2 equivalent
	Agriculture	**Business**	**Energy supply**	**Industrial process**	**Land use change**	**Public**	**Residential**	**Transport**	**Waste management**
1990	5,454	2,255	5,493	761	-29	485	4,116	3,669	1,647
2006	5,212	1,965	5,759	399	-287	138	2,939	5,553	784
Source: AEA Technology									

- In 2006, Northern Ireland's total greenhouse gas emissions were 22,461 ktCO_2 equivalent, a decrease of 6% on 1990 emissions.
- Energy supply, transport and agriculture were the 3 main contributors to greenhouse gas emissions in Northern Ireland in 2006, contributing almost three-quarters (74%) of Northern Ireland's total greenhouse gas emissions.
- In 1990, energy supply, agriculture and residential combustion were the 3 main contributors to greenhouse gas emissions in Northern Ireland, contributing 63% of Northern Ireland's total greenhouse gas emissions, with a lesser contribution from the transport sector (15%).
- Most sectors have shown a decrease on 1990 levels, with the exception of transport and energy supply. In 1990, transport accounted for 3,669 kt CO_2 equivalent. By 2006, this figure was 5,553 kt CO_2 equivalent.

Carbon Dioxide Emissions

Figure 2.8 Carbon dioxide (CO_2) emissions by sector, 1990 & 2006

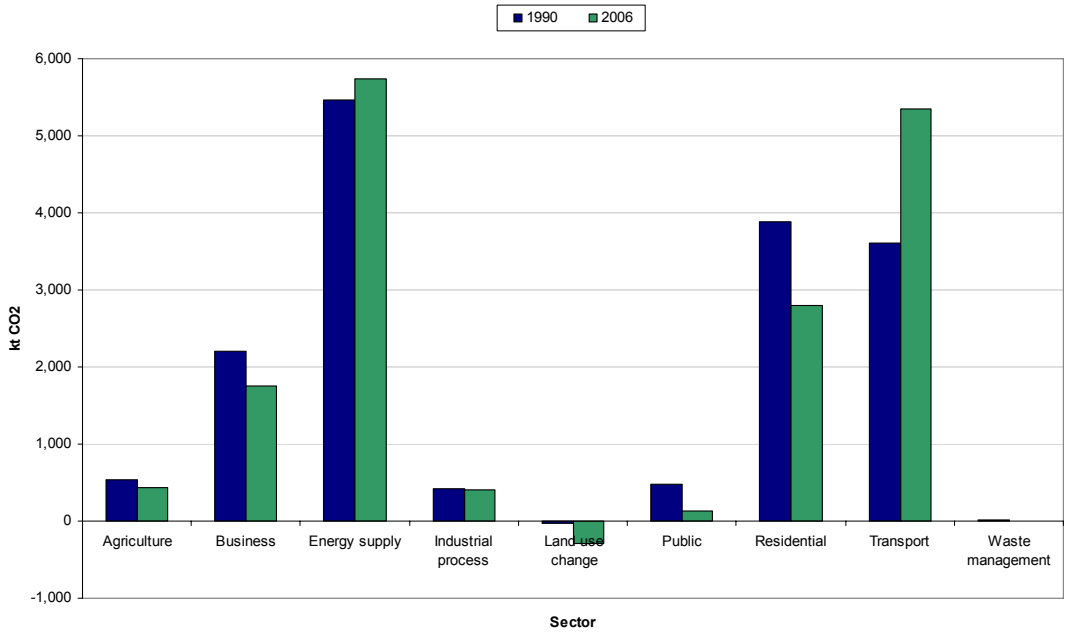


Table 2.8 Carbon dioxide (CO_2) emissions by sector, 1990 & 2006

									Units: kt CO_2
	Agriculture	**Business**	**Energy supply**	**Industrial process**	**Land use change**	**Public**	**Residential**	**Transport**	**Waste management**
1990	543	2,199	5,463	416	-30	480	3,887	3,613	8
2006	436	1,756	5,733	399	-289	137	2,801	5,353	6
Source: AEA Technology									

- In 2006, Northern Ireland emissions of CO_2 amounted to 16,331 kt, a decrease of 1.5% on 1990 emissions. The Sustainable Development strategy for Northern Ireland set a target of a 30% decrease (on 1990 levels) by 2030.

- Energy supply and transport were the most significant contributors to CO_2 emissions, being responsible for 68% of all the CO_2 produced in Northern Ireland in 2006.

- Northern Ireland CO_2 emissions in 2006 represented 2.9% of UK CO_2 emissions, similar to the proportion in 1990 (2.8%).

- The CO_2 reduction achieved in the residential sector is due to the increasing numbers of households on the natural gas network and improvements in home energy efficiency, such as double glazing, cavity wall insulation and roof insulation.

Energy

Figure 2.9 Percentage of electricity produced from indigenous renewable sources, 2000/01 - 2007/08

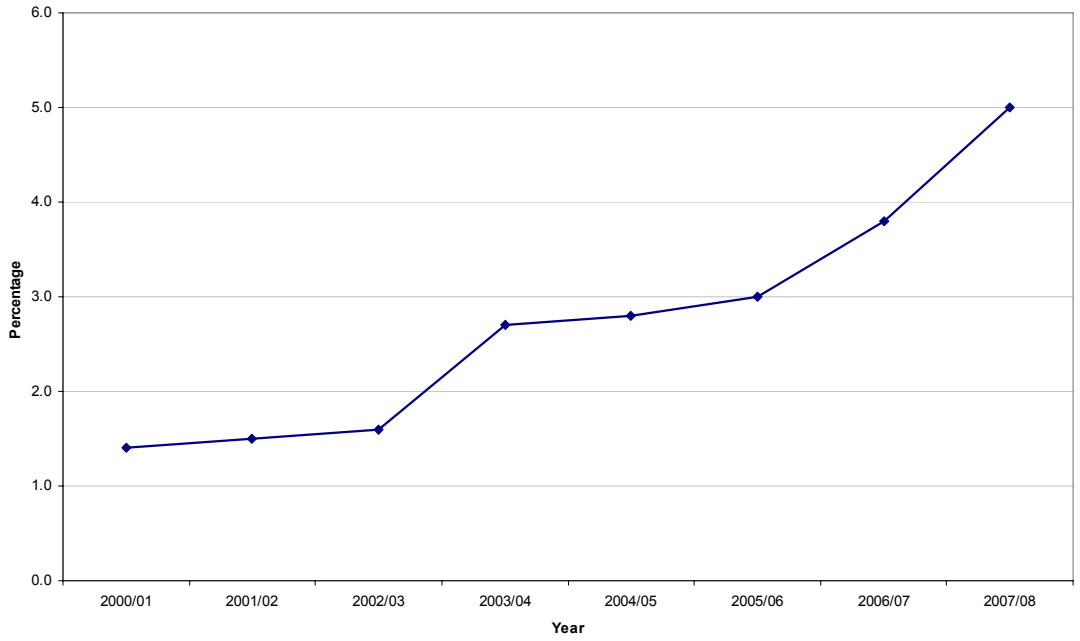


Table 2.9 Percentage of electricity produced from indigenous renewable sources, 2000/01 - 2007/08

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Total renewables (excluding imports) (MWh)	118	128	136	233	249	275	345	441
Total renewables as a % of total consumption	1.4	1.5	1.6	2.7	2.8	3.0	3.8	5.0
Source: DETI								

- The Northern Ireland Renewables Obligation, published in October 2004, sets a target that by 2012, 12% of all electricity consumed in Northern Ireland is generated from indigenous renewable sources, for example wind farms.

- In 2007/08, 441 MWh of electricity in Northern Ireland was produced from renewable sources. This was equivalent to 5% of the total electricity consumption in that period.

- There has been a sizable increase in the amount of electricity produced from renewable sources since 2000/01, when only 118MWh (1.4% of total electricity consumed) was renewable.

Environmental Installations

Figure 2.10 Planning applications for environmental installations, 2002/03 – 2007/08

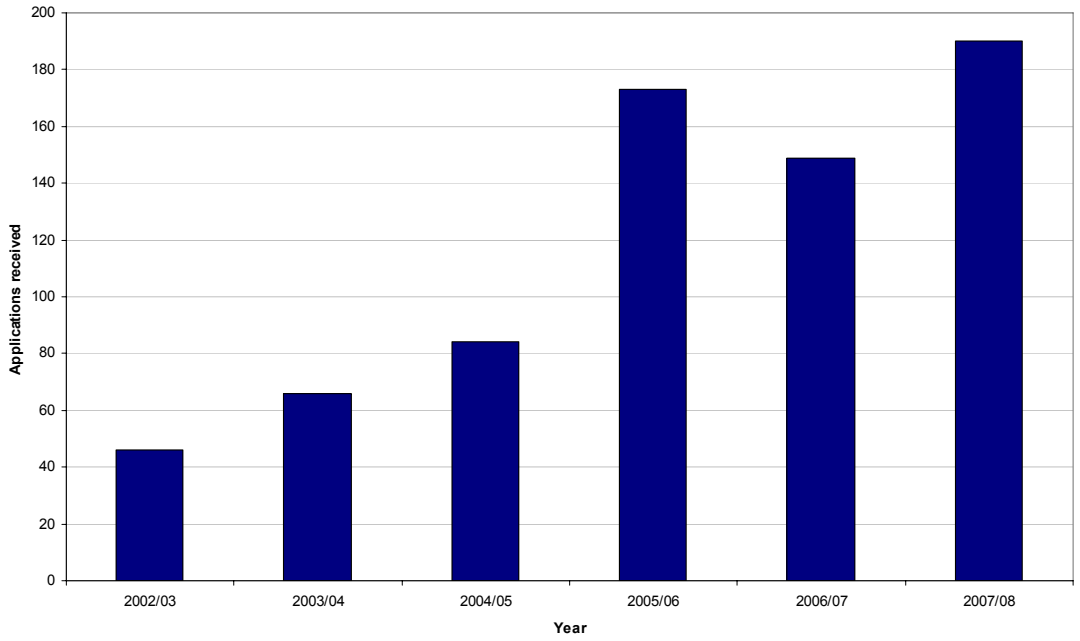


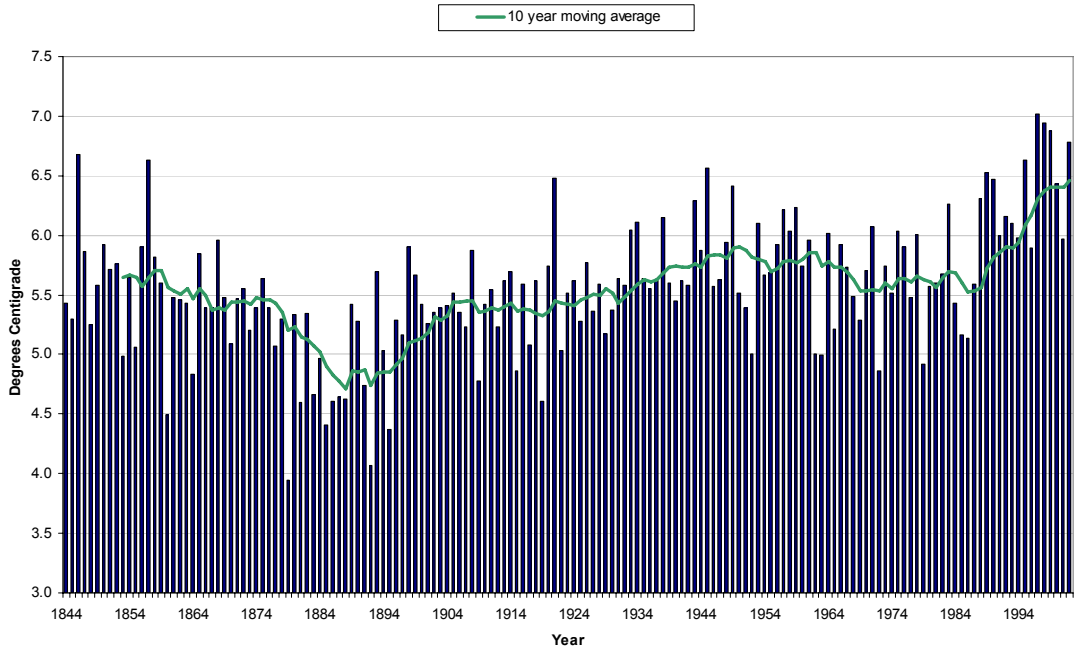
Table 2.10 Planning applications for environmental installations, 2002/03 – 2007/08

	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Received	46	66	84	173	149	190
Decided	33	32	35	89	93	218
Approved	32	31	35	88	87	210
Percentage approved	97	97	100	99	94	96
Source: Planning Service						

- Planning Service monitor the number of applications for environmental installations. These include wind turbines, solar water heating panels, wood pelletising plants and solar panels.
- There has been a marked increase in the number of applications received in the last 6 years.
- In 2002/03, Planning Service received 46 applications for such installations.
- In 2007/08, 190 applications were received, more than four times as many applications as were received in 2002/03.

Climate Change

Figure 2.11 Mean annual minimum temperature, 1844 – 2002

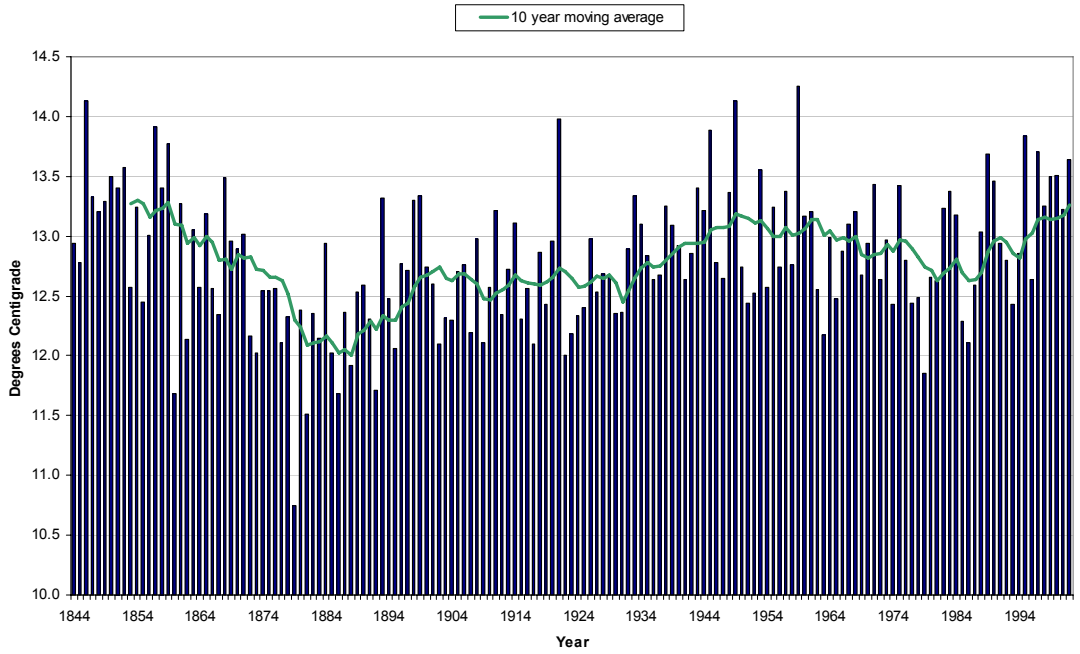


Source: Armagh Observatory

- The mean annual minimum temperature for Northern Ireland has been calculated from the Armagh Observatory temperature records.
- The 10 year moving average trend line shows that the annual minimum temperature reached a low towards the end of the 19th century, and has been steadily increasing since.
- Since 1990, the 10 year moving average mean annual minimum temperature has risen to its highest levels since the temperature records began.
- 1997 had the highest mean annual minimum temperature recorded in the period up to 2002 (7.02°C).
- The lowest mean annual minimum temperature (3.95°C) recorded in the period up to 2002 was recorded in 1879.

Climate Change

Figure 2.12 Mean annual maximum temperature, 1844 – 2002

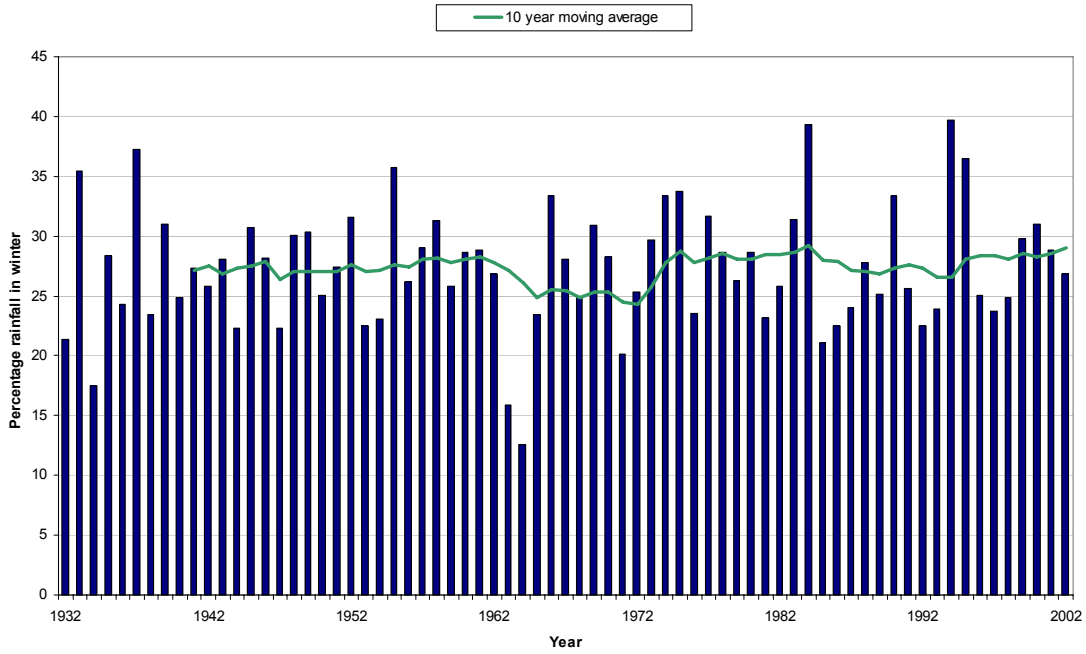


Source: Armagh Observatory

- The mean annual maximum temperature for Northern Ireland has been calculated from the Armagh Observatory temperature records.
- The 10 year moving average trend line shows that the annual maximum temperature reached a low towards the end of the 19th century, and has been steadily increasing ever since.
- Since the late 1990s, the average maximum temperature has been relatively high.
- 1959 had the highest mean annual maximum temperature recorded in the period up to 2002 (14.25°C).
- The lowest mean annual maximum temperature (10.74°C) in the period up to 2002 was recorded in 1879.

Climate Change

Figure 2.13 Percentage annual winter rainfall, 1932 – 2002



Source: Armagh Observatory

- Rainfall records are also kept at Armagh Observatory. The amount of rainfall observed in winter (December to February) is calculated as a percentage of annual rainfall (December to November).

- The 10 year moving average for the percentage of annual rainfall in winter shows only a slightly evident trend towards a higher percentage of mean annual rainfall falling in the winter months.

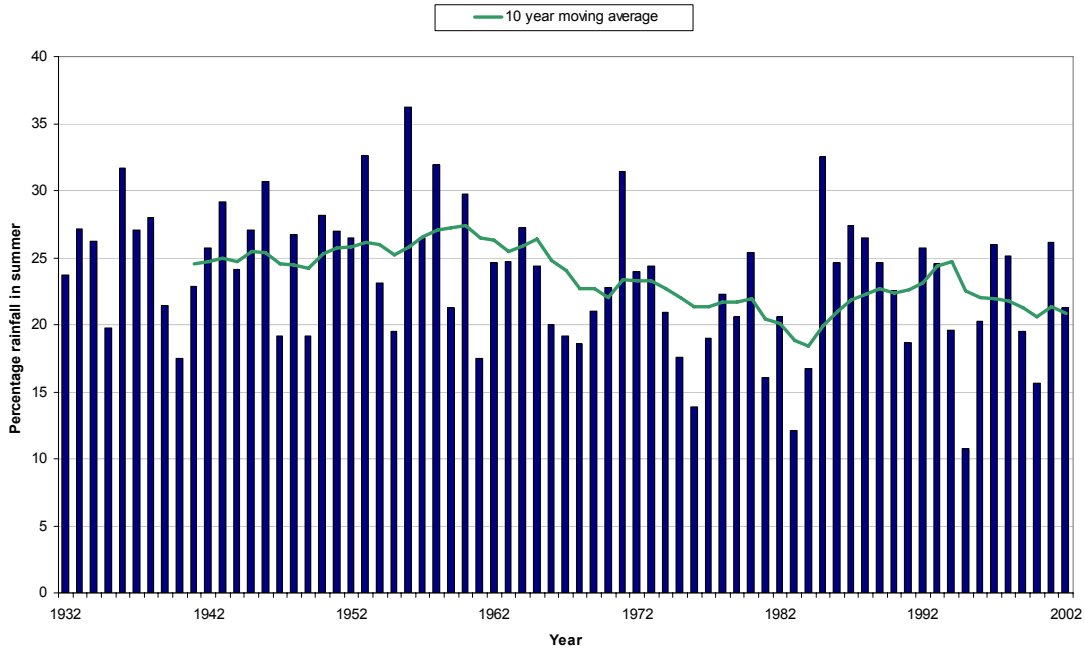
- The 10 year moving average dips quite significantly in the 1960s. This is due to the annual percentage of rainfall falling in winter being particularly low in 1963 and 1964.

- The wettest winter on record was 1994, when 40% of the year's rainfall fell in the three winter months.

- The lowest level recorded was in 1964, when just 13% of the annual rainfall fell between December and February.

Climate Change

Figure 2.14 Percentage annual summer rainfall, 1932 – 2002



Source: Armagh Observatory

- Rainfall records are also kept at Armagh Observatory. The amount of rainfall observed in summer (June to August) is calculated as a percentage of annual rainfall (December to November).

- The 10 year moving average for the percentage of annual rainfall in summer shows only a slightly evident trend towards a lower percentage of mean annual rainfall falling in the summer months.

- The 10 year moving average increases in the late 1980s and early 1990s. This is due to the annual percentage of rainfall falling in summer increasing markedly in the years 1985 to 1990 when compared to the five years previous.

- The highest level recorded until 2002 was in 1956, when 36% of the year's rainfall fell in the three summer months.

- The three driest summers were recorded in 1976, 1983 and 1995 (with 1995 being the driest), when less than 15% of the annual rainfall fell between June and August.

3. Water

Water is an essential natural resource and plays a vital role in maintaining biodiversity, our health and social welfare and our economic development. Our rivers, lakes, estuaries, seas and groundwater provide water to sustain many of our core social and economic activities, and also provide drinking water for our population. This chapter will report on the condition of Northern Ireland's inland waters, and on the levels of compliance with waste water standards and our drinking water standards. Indicators on the state of the marine environment are covered in Chapter 4.

There are over 15,000km of rivers and streams in Northern Ireland, of which approximately one third is monitored annually. Monitoring is carried out routinely against national standards for the General Quality Assessment (GQA) classification scheme. The majority of monitored river length is of at least a good standard (Class B and above), both chemically (75% in 2005-07) and biologically (59% in 2007).

Lakes are a significant source of drinking water supplies. Lough Neagh and Upper and Lower Lough Erne make up over 90% of the total hectarage of lakes greater than 50 hectares in Northern Ireland. Excess levels of phosphorus are considered to be the main nutrient contributing to eutrophication on lakes across Europe, and there is evidence to suggest that the number of our lakes that are excessively nutrient enriched is increasing.

Effluent discharges to our water environment can affect its quality and come from many different sources such as commercial and industrial premises, wastewater and water treatment works and private dwellings. These discharges are controlled by the Department of the Environment through the granting of consents and permits under the Water (NI) Order 1999 and the Pollution Prevention and Control Regulations (NI) 2003.

New EC Water Framework Directive classifications are being developed for water bodies which will be based on physical, chemical and ecological parameters. These will give a more holistic view of the quality of our rivers and lakes for future reports and will replace existing classification schemes.

Eutrophication in Rivers

Figure 3.1 Percentage of river length with >0.1mg/l annual mean soluble reactive phosphorus (SRP), 2000 – 2007

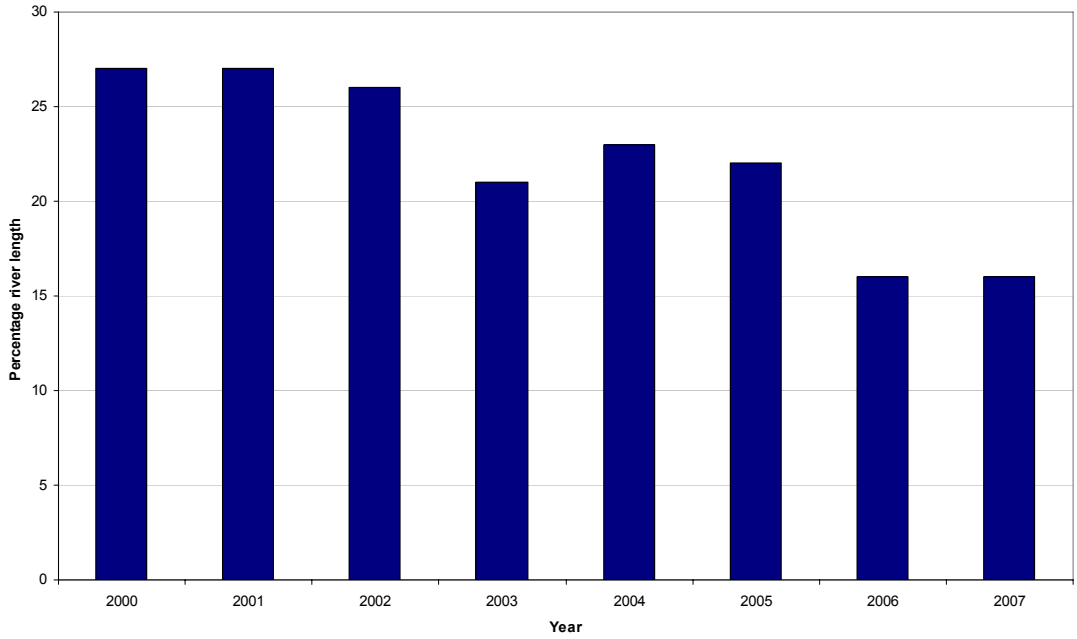


Figure 3.1 Percentage of river length with >0.1mg/l annual mean soluble reactive phosphorus (SRP), 2000 – 2007

						Unit: Percentage river length		
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
River length >0.1mg/l	27	27	26	21	23	22	16	16
Source: NIEA								

- Phosphorus occurs naturally in water and is required by plants to grow. However, elevated levels of phosphorus can lead to eutrophication (often expressed as excessive algae growth) in freshwater, and can cause severe reductions in water quality.

- UK guidance for identifying rivers which may be sensitive to eutrophication sets a level of >0.1mg SRP/l as indicative of enrichment.

- In 2007, 16% of monitored river length in Northern Ireland had an annual mean of phosphorus greater than 0.1mg/l.

- Since 2001, there has been a steady decline in the percentage of river length with >0.1 mg SRP/l, decreasing from 27% in 2001 to the current level of 16%. This decrease coincides with a decline in the purchase and rate of application of phosphorus fertilisers.

Chemical River Quality

Figure 3.2 GQA Chemical classification (% river length), 1996-98 – 2005-07

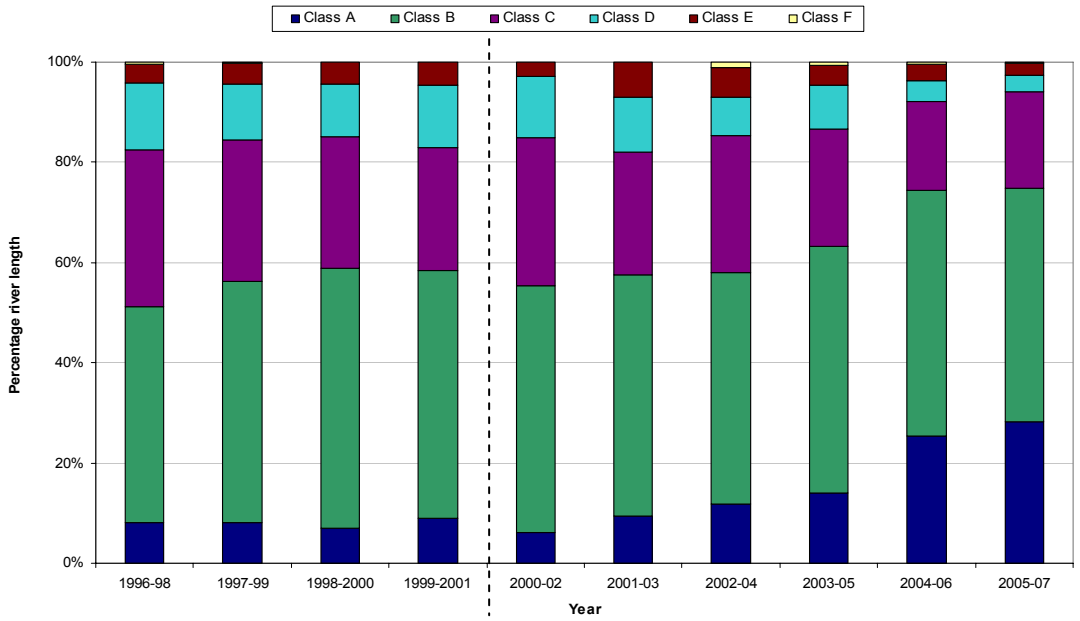


Table 3.2 GQA Chemical classification (% river length), 1996-98 – 2005-07

Unit: Percentage river length

	Chemical classification					
	Class A	Class B	Class C	Class D	Class E	Class F
	Very good	Good	Fairly good	Fair	Poor	Bad
1996-98	8.1	43.0	31.4	13.4	3.6	0.5
1997-99	8.1	48.2	28.2	11.2	4.0	0.3
1998-2000	6.9	51.9	26.4	10.5	4.3	0
1999-2001	9	49.4	24.5	12.6	4.5	0
2000-02	6.1	49.3	29.4	12.3	2.9	0
2001-03	9.5	48.1	24.4	11	6.9	0.1
2002-04	11.8	46.1	27.4	7.8	5.8	1.1
2003-05	14.0	49.2	23.4	8.9	3.9	0.6
2004-06	25.4	48.9	17.9	4.1	3.2	0.5
2005-07	28.3	46.6	19.1	3.3	2.5	0.2

Source: NIEA

- GQA Chemical classification is based on organic pollution using biochemical oxygen demand, dissolved oxygen and ammonia to classify river reaches from Class A (Very Good) to Class F (Bad) on a three year rolling sampling period.

- According to NIEA water quality standards, rivers should be at least 'good' (Class A or B) under the adopted classification system, with no downward movement between classes.

- Since 2000, the chemical monitoring programme has been extended to include the measurement of secondary rivers. This has increased the length of chemically monitored rivers from 2,400 km to about 5,000 km.

- In 2005-07, 75% of river length monitored was classified as 'good' or 'very good'.

Chemical River Quality

Figure 3.3 Freshwater Fish Directive compliance failure summary, 1998 – 2007

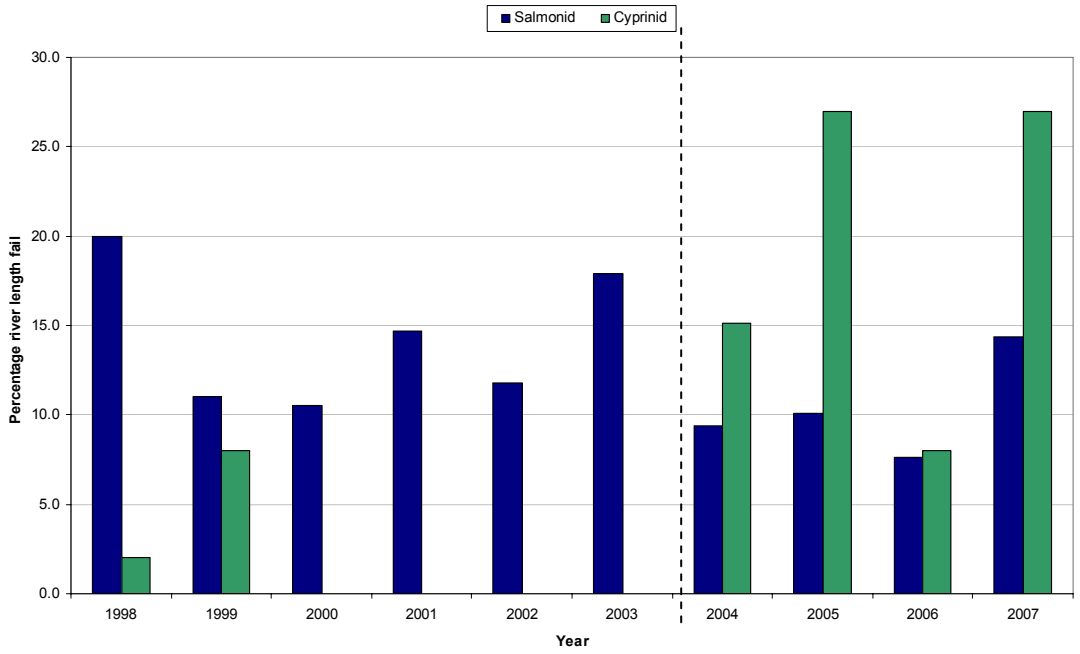


Table 3.3 Freshwater Fish Directive compliance failure summary, 1998 – 2007

								Unit: Percentage river length fail		
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Salmonid	20.0	11.0	10.5	14.7	11.8	17.9	9.4	10.1	7.6	14.4
Cyprinid	2.0	8.0	0.0	0.0	0.0	0.0	15.1	27.0	8.0	27.0
Source: NIEA										

- The Freshwater Fish Directive requires the designation of waters needing protection or improvement in order to support fish life. They are divided into two categories: suitable for salmonids (salmon & trout) and suitable for cyprinids (coarse fish).

- The length of designated rivers in Northern Ireland increased from almost 1,200km in 2003 to just less than 4,300km in 2004. This is made up of 4,154km of salmonid rivers and 126km of cyprinid. These rivers are monitored and compliance is measured against water quality standards set by the directive.

- The majority of cyprinid rivers were re-designated as salmonid at the start of 2004 and around 100km of new river lengths were designated as cyprinid. This led to an increase in the percentage failure recorded (although the overall river length of cyprinid designations is low).

- In 2007, 14% of salmonid river length and 27% of cyprinid river length failed to meet the standards set by the directive.

Biological River Quality

Figure 3.4 GQA Biological classification (% river length), 1998 - 2007

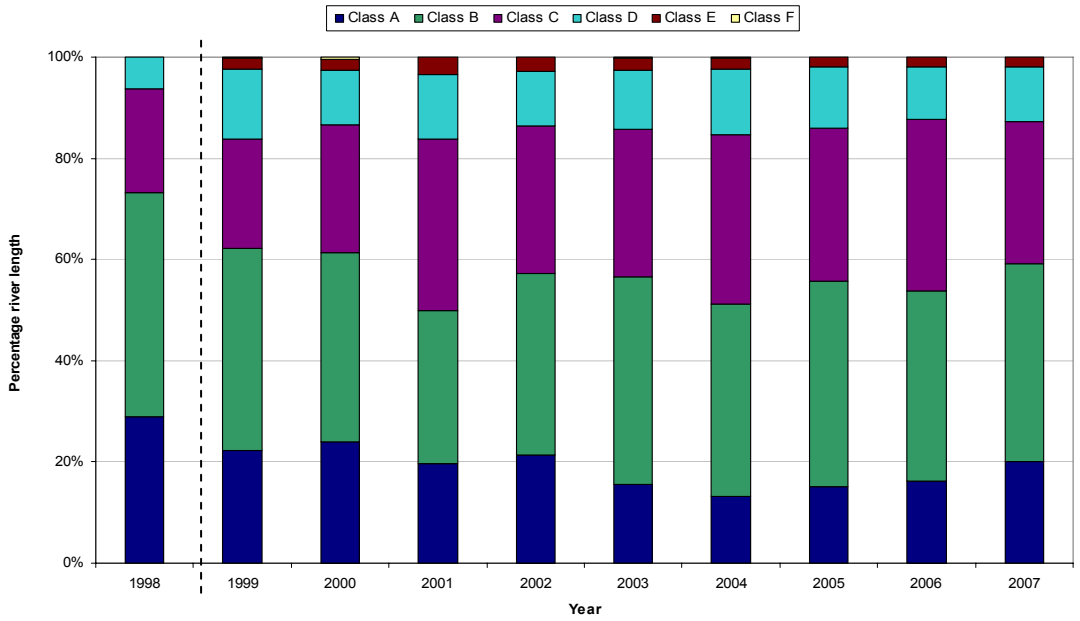


Table 3.4 GQA Biological classification (% river length), 1998 – 2007

				Unit: Percentage river length		
	Biological classification					
	Class A	Class B	Class C	Class D	Class E	Class F
	Very good	Good	Fairly good	Fair	Poor	Bad
1998	28.9	44.3	20.5	6.2	0.0	0.0
1999	22.3	40.0	21.6	13.7	2.2	0.2
2000	24.0	37.5	25.2	10.7	2.3	0.4
2001	19.6	30.3	33.8	12.7	3.4	0.1
2002	21.4	36.0	29.0	10.8	2.9	0.0
2003	15.5	41.1	29.1	11.7	2.3	0.2
2004	13.2	37.9	33.5	13.0	2.2	0.2
2005	15.1	40.6	30.2	12.1	1.9	0.1
2006	16.1	37.7	33.8	10.4	2.0	0.0
2007	20.1	39.0	28.1	10.8	2.0	0.0
Source: NIEA						

- Biological monitoring for GQA classification involves determination of the diversity of macroinvertebrates (such as insect larvae, molluscs and shrimps) that live in the river, to score biological river quality from Class A (Very Good) through to Class F (Bad).

- According to NIEA water quality standards, rivers should be at least ‘good’ (Class A or B) under the adopted classification system, with no downward movement between classes.

- In 1999, a review of the river network led to an increase in the length of river biologically monitored from 2,400km to almost 5,500km.

- In 2007, 59% of river length monitored was classified as ‘good’ or ‘very good’.

Lake Quality

Figure 3.5 Number of lakes in each OECD class (based on annual mean total phosphorus), 2004 - 2007

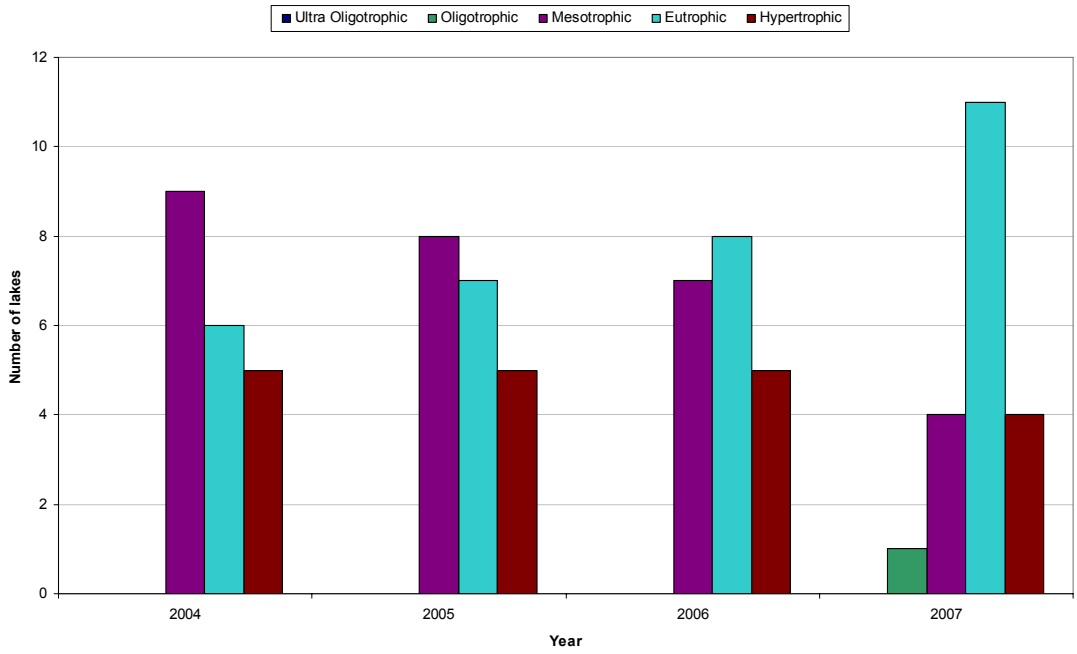


Table 3.5 Number of lakes in each OECD class (based on annual mean total phosphorus), 2004 - 2007

					Unit: Number of lakes	
	Ultra oligotrophic (≤4 µgP/l)	**Oligotrophic (≤10 µgP/l)**	**Mesotrophic (≤35 µgP/l)**	**Eutrophic (≤100 µgP/l)**	**Hypertrophic (>100 µgP/l)**	**All classes**
	High	**Good**	**Moderate**	**Poor**	**Bad**	
2004	0	0	9	6	5	**20**
2005	0	0	8	7	5	**20**
2006	0	0	7	8	5	**20**
2007	0	1	4	11	4	**20**
Source: NIEA						

- All of the Northern Ireland lakes of area greater than 50 hectares are sampled each month for total phosphorous (TP) and the annual mean TP is used to classify these lakes according to their trophic status, from high quality, ultra oligotrophic lakes to bad quality, hypertrophic lakes.

- The data shows that most of our largest lakes show excessive nutrient enrichment (i.e. annual lake phosphorus > 35 µgP/l). The number of lakes in the eutrophic and hypertrophic classes has increased from 11 in 2004 to 15 in 2007.

- Lakes differ to rivers in that concentrations of phosphorus can build up over time due to the static and constrained nature of most lakes. In comparison, rivers are flowing dynamic systems in which concentration increases over time seldom happen.

Groundwater Quality

Figure 3.6 Nitrate concentrations at groundwater monitoring sites, 2000 – 2006

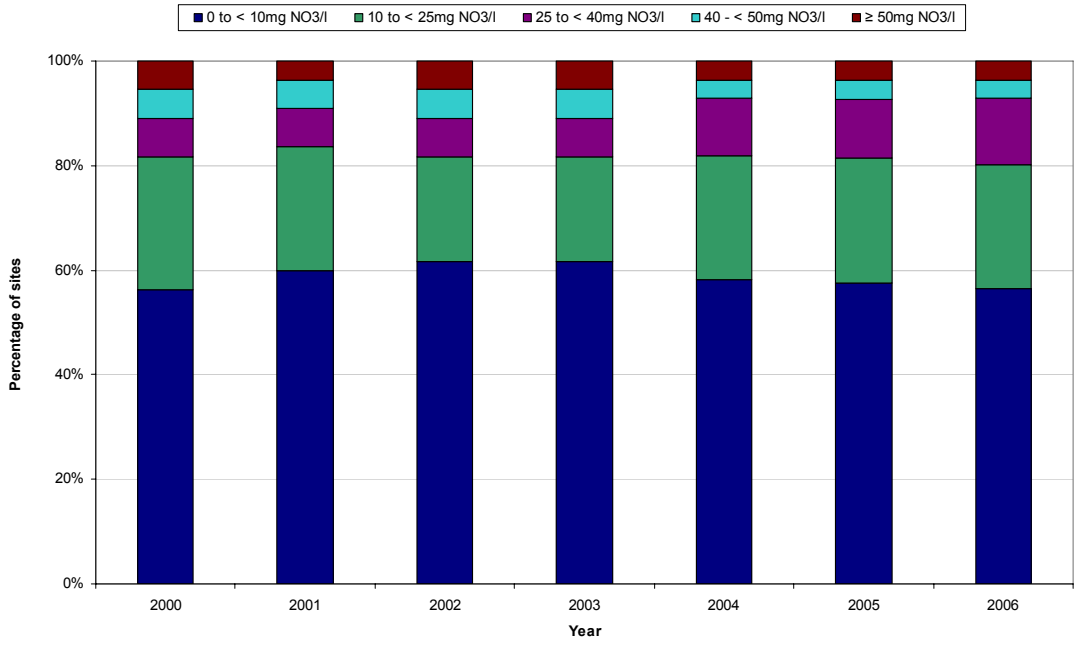


Table 3.6 Nitrate concentrations at groundwater monitoring sites, 2000 – 2006

					Unit: Percentage of sites		
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
0 to < 10mg NO_3/l	56.4	60.0	61.8	61.8	58.2	56.4	56.4
10 to < 25mg NO_3/l	25.5	23.6	20.0	20.0	23.6	23.6	23.6
25 to < 40mg NO_3/l	7.3	7.3	7.3	7.3	10.9	10.9	12.7
40 - < 50mg NO_3/l	5.5	5.5	5.5	5.5	3.6	3.6	3.6
≥ 50mg NO_3/l	5.5	3.6	5.5	5.5	3.6	3.6	3.6
Source: NIEA							

- Regional monitoring of nitrate concentrations in groundwater across Northern Ireland began in 2000. Before this date, nitrate concentrations were measured at a smaller number of specified sites. Out of approximately 80 sampling sites per year, 55 sites were continuously monitored between 2000 and 2006.

- One of the requirements of the EC Nitrates Directive (91/676/EEC) is to identify all surface freshwaters and groundwaters that contain 'elevated' levels of nitrate i.e. nitrate concentrations in excess of, or trending towards, 50mg NO_3/l.

- Results show that in the period of 2000 to 2006, approximately 95% of sites had an annual average concentration of less than 50mg NO_3/l.

Industrial Discharge Quality

Figure 3.7 Trends in annual private and trade discharge consent compliance (EA 95-percentile), 2000 - 2007

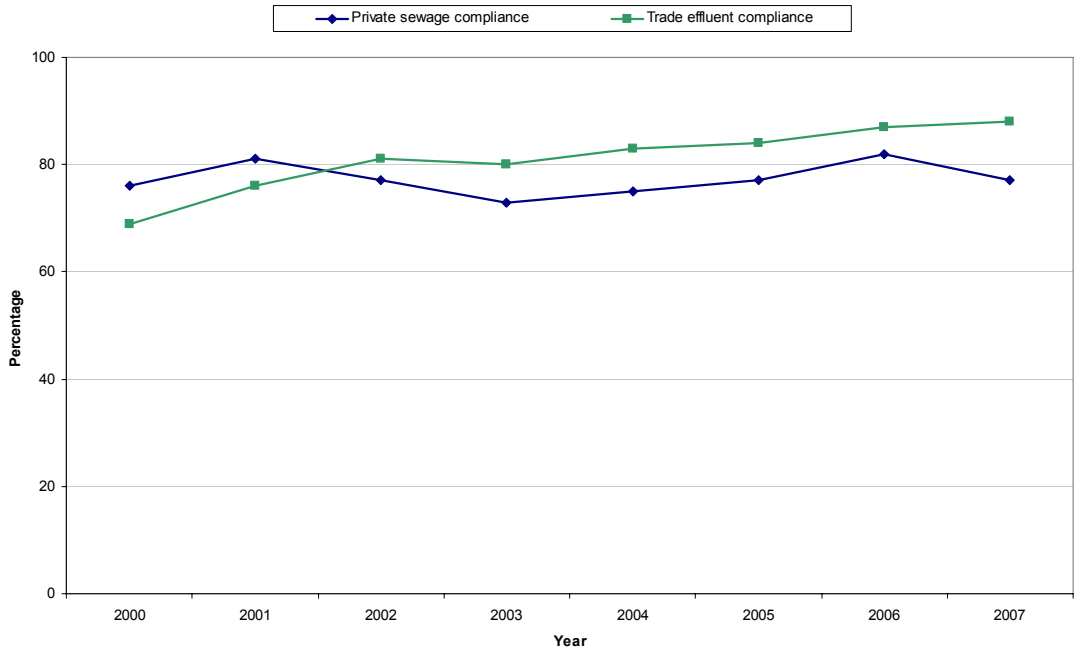


Table 3.7 Trends in annual private and trade discharge consent compliance (EA 95-percentile), 2000 – 2007

Unit: Percentage

	2000	2001	2002	2003	2004	2005	2006	2007
Private sewage compliance	76	81	77	73	75	77	82	77
Trade effluent compliance	69	76	81	80	83	84	87	88

Source: NIEA

- The monitoring of effluent discharges gives an indication of levels of pollution to the water environment and improvements in controls.
- Numerical limits on Water Order consents for private sewage and trade discharges are set as absolute standards. However, compliance is assessed on a 95-percentile basis, i.e. a discharge must be within its consent conditions 95% of the time to comply.
- Compliance for private sewage has ranged from 73 – 82% since 2000.
- There has been a steady increase from 69% in 2000 to 88% in 2007 for trade effluent compliance.

Water Utility Discharge Quality

Figure 3.8 Compliance of water utility discharges (95-percentile), 2000 – 2006

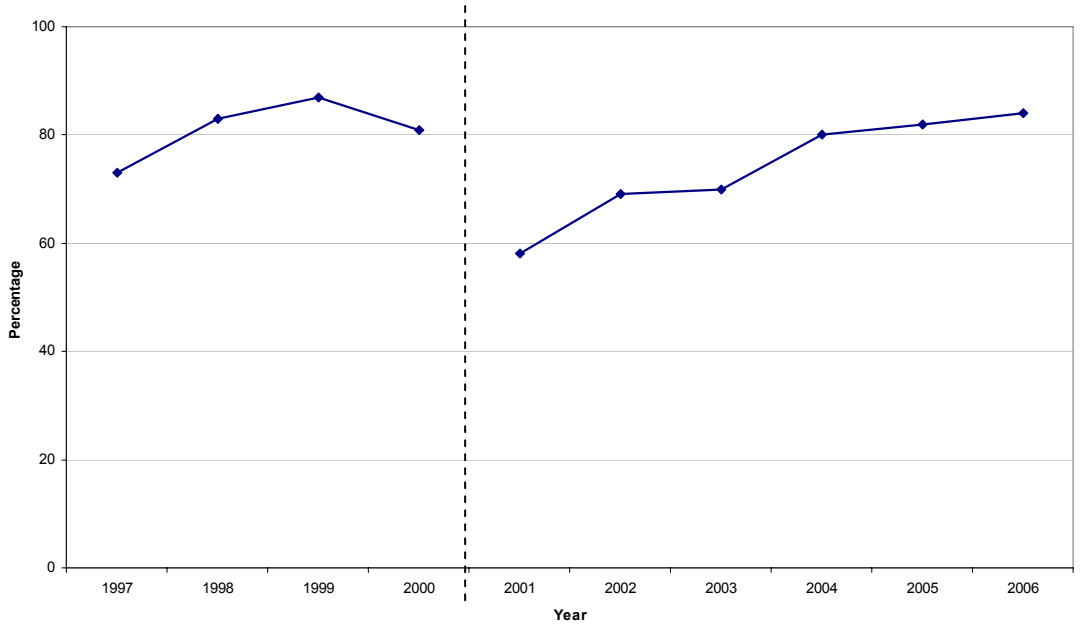


Table 3.8 Compliance of water utility discharges (95-percentile), 2000 - 2006

Unit: Percentage

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Overall compliance with WWTW discharge standards	73	83	87	81	58	69	70	80	82	84
Source: NIEA										

- NIEA monitors the compliance of NI Water discharges from Waste Water Treatment Works (WWTW) and Water Treatment Works (WTW) against registered standards and the Urban Waste Water Treatment (UWWT) Regulations. Some WWTW have been identified as discharging to sensitive areas and their effluent will require more stringent treatment.

- Overall compliance with WWTW registered standards has shown an increase since 1997, up from 73% to 84% in 2006.

- Compliance levels fell to 58% in 2001, but have since recovered to similar levels to those observed in 1998 – 2000.

- This decrease can be explained by an increase in the number of sites between 2000 and 2001. In 2000, there were 160 sites, but the following year there were 268. This was due to the addition of those works to the public register with population equivalent down to 250. Previously, monitoring had only occurred at those works with a population equivalent of 1,000.

Drinking Water Quality

Figure 3.9 Percentage mean zonal compliance failure with Northern Ireland water quality regulations drinking water standards, 2004 - 2007

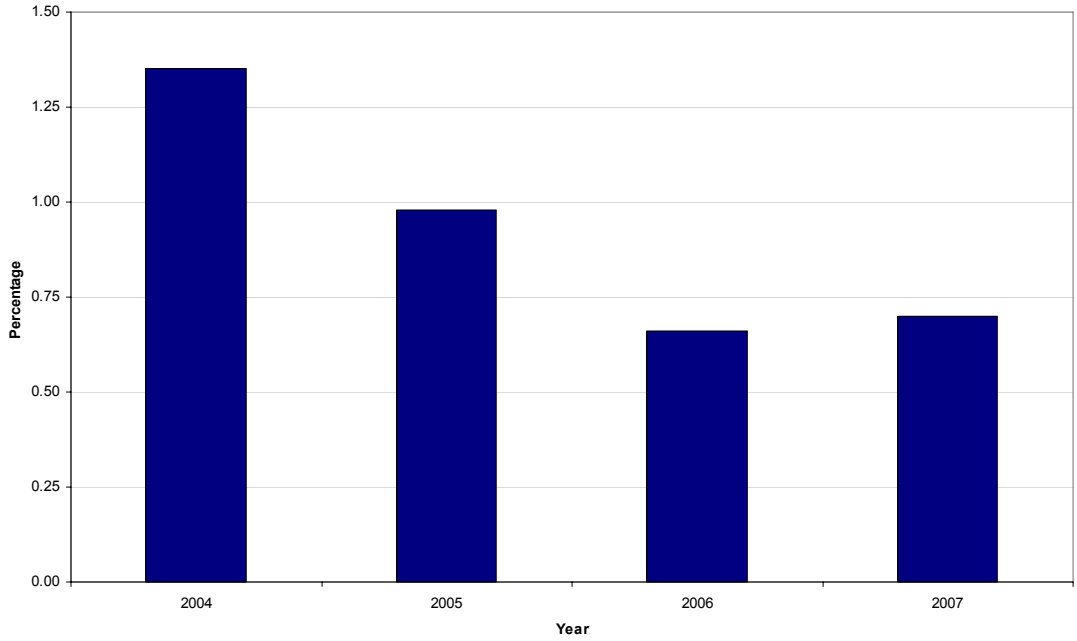


Table 3.9 Percentage mean zonal compliance failure with Northern Ireland water quality regulations drinking water standards, 2004 - 2007

			Unit: Percentage	
	2004	**2005**	**2006**	**2007**
Mean zonal compliance	98.65	99.02	99.34	99.30
Mean zonal compliance failure	1.35	0.98	0.66	0.70
Source: NIEA				

- Drinking water quality at consumer taps is assessed using 'mean zonal compliance', an index which is calculated using 40 parameters from the regulatory sampling programme.

- The results for mean zonal compliance are based on upwards of 50,000 samples taken at consumers' taps across Northern Ireland throughout the year.

- In 2007, the mean zonal compliance for Northern Ireland was 99.3%, a significant improvement on the level in 2004 of 98.65%.

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4. Marine

The majority of Northern Ireland's 650km of coastline is protected for its special interest and a number of our coastal species and habitats are recognised as internationally important. The marine life in the seas surrounding Northern Ireland is rich and varied and includes marine mammals such as common seals, whales and dolphins, seabirds, waterfowl and other species that migrate here. Our coastline also includes productive and biologically diverse ecosystems, with features which serve as critical natural defences against storms, floods and erosion. This chapter looks at the quality of our estuarine and coastal water quality, fish stock levels and our marine survival rates.

Bathing water quality is measured against mandatory and guideline standards. Only two beaches (out of 23 monitored) in Northern Ireland failed to meet the mandatory standards in 2007. Less than half satisfied the guideline standards.

Dissolved inorganic nitrogen (nitrate, nitrite and ammonium (DIN)) is an important indicator of marine nutrient status, as nitrogen is the most important nutrient in limiting marine algal growth. Monitoring has shown that winter concentrations of dissolved inorganic nitrogen each year in Northern Ireland's five sea loughs are either reducing or stable.

Marine survival rates for Atlantic salmon saw an increase in 2006, reversing a downward trend that had existed for the 10 years previous. However, survival rates are still well below the high and relatively stable levels that were common prior to 1997 which averaged over 30% across a 10 year period.

Bathing Water Quality

Figure 4.1 Bathing water compliance for microbial standards, 1998 - 2007

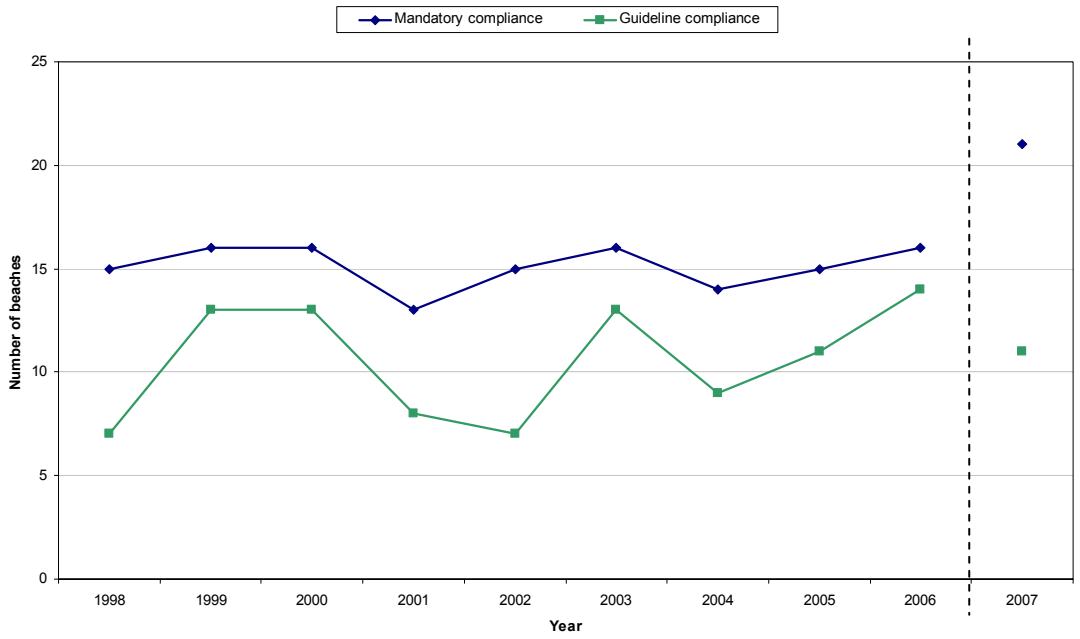

Table 4.1 Bathing water compliance for microbial standards, 1998 - 2007

									Unit: Number of beaches	
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Mandatory compliance	15	16	16	13	15	16	14	15	16	21
Guideline compliance	7	13	13	8	7	13	9	11	14	11
Source: NIEA										
Note: Up until 2006, there were 16 beaches monitored in Northern Ireland. This increased to 23 beaches in 2007.										

- The Bathing Waters Directive mandatory standard requires that 95% of samples collected throughout the bathing season must not exceed the limits set for total and faecal coliforms which are 10,000 and 2,000 colony forming units (cfu)/100ml respectively.

- To comply with guideline values, 80% of samples should not exceed 500 cfu/100ml for total coliforms and 100 cfu/100ml for faecal coliforms, and 90% of samples must not exceed 100 cfu/100ml for faecal streptococci.

- Up until 2006, there were 16 beaches monitored in Northern Ireland. In 2007, this number increased to 23.

- In 2007, two beaches (out of 23 monitored) in Northern Ireland failed to meet the mandatory standards, eleven achieved the higher guideline standard.

Winter Nutrient Concentrations

Figure 4.2 Winter dissolved inorganic nitrogen for five sea loughs, 1997 – 2006

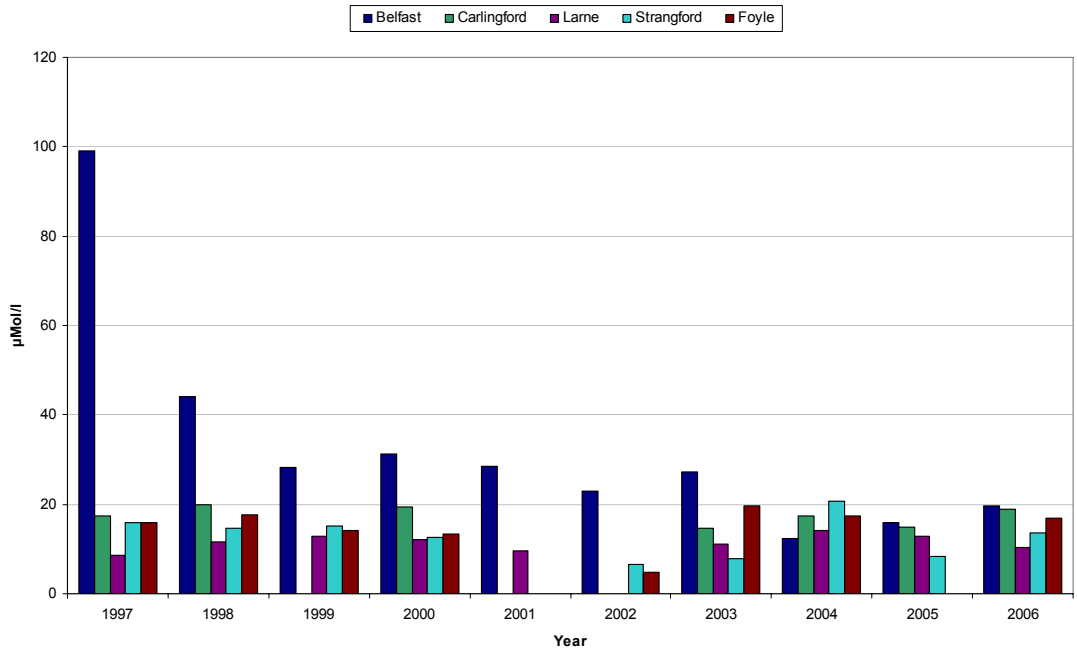

Table 4.2 Winter dissolved inorganic nitrogen for five sea loughs, 1997 – 2006

									Units: µMol/l	
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Belfast	99.0	44.2	28.2	31.2	28.6	22.9	27.2	12.4	15.9	19.7
Carlingford	17.5	20.0	n/a	19.5	n/a	n/a	14.7	17.4	14.9	18.8
Larne	8.5	11.6	12.8	12.1	9.6	n/a	11.1	14.1	12.9	10.5
Strangford	16.0	14.5	15.2	12.7	n/a	6.6	7.8	20.6	8.3	13.6
Foyle	15.8	17.7	14.2	13.3	n/a	4.8	19.6	17.3	n/a	16.9
Source: NIEA										

- Dissolved inorganic nitrogen is measured during the winter period, when algal activity is minimal and nutrient concentrations are most stable.

- Dissolved inorganic nitrogen concentrations in our sea loughs are either reducing or stable.

- Sustained reductions in dissolved inorganic nitrogen in Belfast Lough are due to significant reductions in nutrient inputs from both waste water treatment works and industry.

- Winter sampling difficulties have meant that a complete set of values have not been available for all five sea loughs over the last 10 years.

Marine Survival Rates

Figure 4.3 Marine survival rates of wild salmon in the River Bush, 1997 - 2006

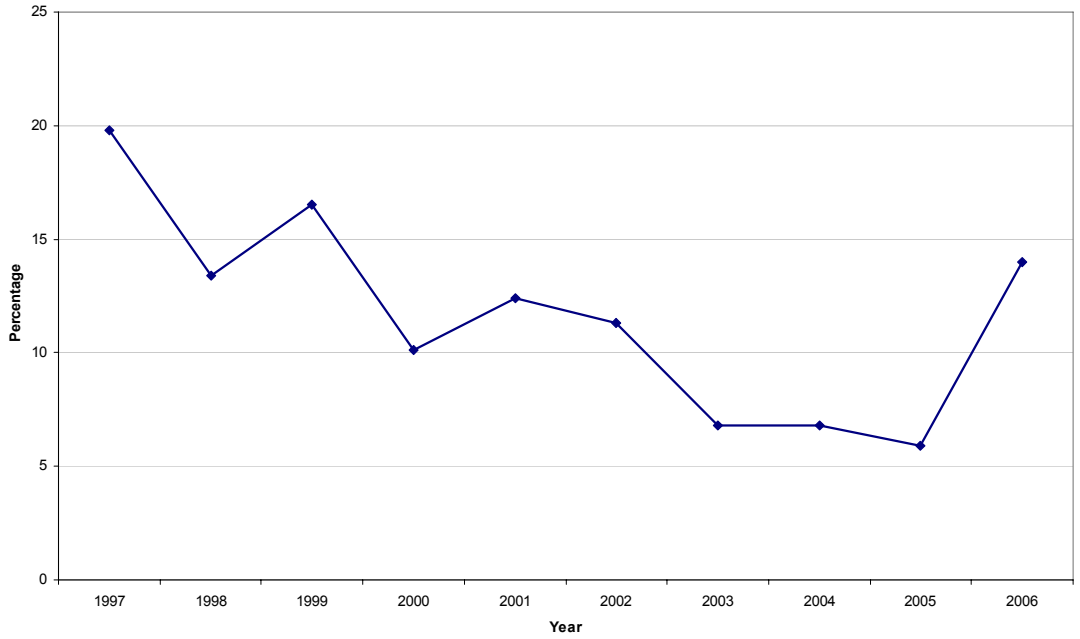

Table 4.3 Marine survival rates of wild salmon in the River Bush, 1997 - 2006

									Unit: Percentage	
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Survival rate	19.8	13.4	16.5	10.1	12.4	11.3	6.8	6.8	5.9	14.0
Source: AFBI										

- Atlantic salmon live mostly in the sea but breed in fresh water and are monitored on a small number of index rivers throughout the North Atlantic.

- Estimates of survival of wild and hatchery origin River Bush fish returning to homewaters are available from coded wire tagging studies conducted at the River Bush salmon station.

- The survival index recorded in 2007 (14%) represents the first increase in marine survival noted for the River Bush stock for a number of years and is higher than the previous 5 year mean (8.6%) and slightly higher than the previous 10 year average (13.4%).

- Although the survival index for 2007 represents an improvement upon recent years, survival rates are still well beneath the high and relatively stable levels that predominated prior to 1997 which averaged over 30% across a 10-year period.

5. Land

Land and landscape management have the greatest visual impact on our environment and our appreciation of it. Whether the land is used for agriculture, housing or forestry its value is immense and perhaps most importantly, it is a limited resource. This chapter examines soil quality, forest and woodland plantings, the role of agri-environment schemes on our land, housing completions and designations of townscape and villagescape.

Soil quality in Northern Ireland has increased in recent years. In 2007/08, 21% of soils would be considered to be over-enriched with phosphorus compared to 37% in 2004/05.

Agri-environment schemes are schemes that attempt to manage our agricultural land in a more sustainable way. At the end of 2007, 448,000 hectares of land in Northern Ireland were under agri-environment scheme management, with a further 6,000 hectares managed by the organic farming scheme.

Forests and woodlands provide important habitats, natural resources and diversity to landscapes. In Northern Ireland in 2007, there were more than 500 hectares of new plantings, with half of these coming from short rotation coppice.

The number of new dwellings has slowly increased over the last number of years, with housing completions in 2006/07 increasing by 11% on 2000/01 figures. Housing completions in greenfield areas have almost doubled since 2000/01, up from 1,182 completions in 2000/01 to 2,306 in 2006/07.

Soil Quality

Figure 5.1 Soil phosphorus (as Olsen-P) by P-index for managed grassland soils, 2004/05 – 2007/08

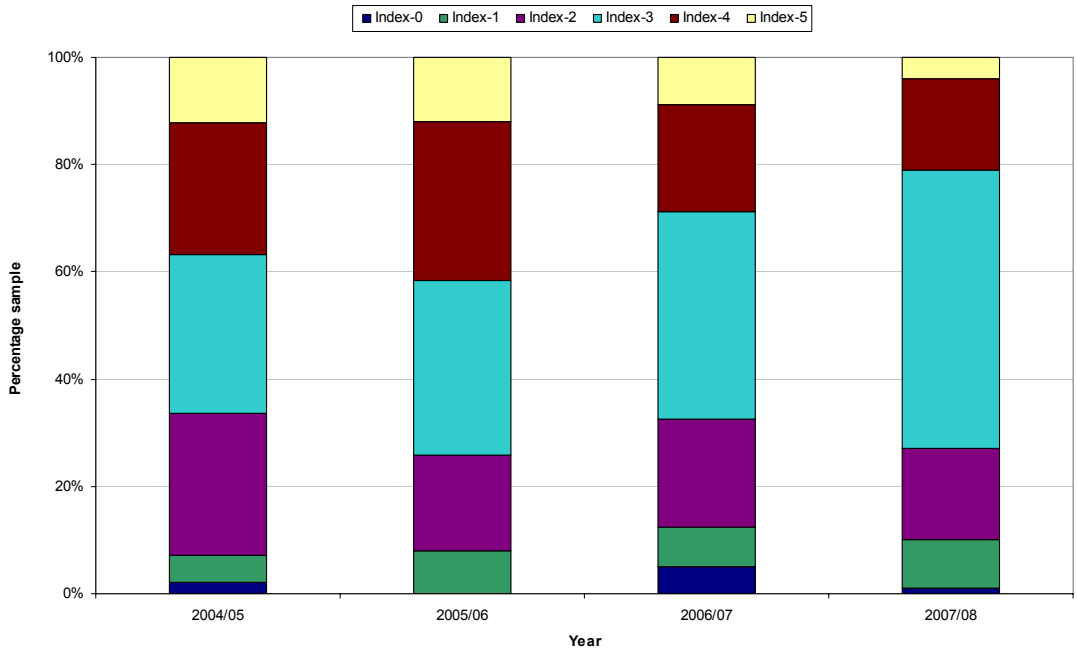

Table 5.1 Soil phosphorus (as Olsen-P) by P-index for managed grassland soils, 2004/05 – 2007/08

					Unit: Percentage sample	
	Index-0	**Index-1**	**Index-2**	**Index-3**	**Index-4**	**Index-5**
	Low or deficient		**Sufficient**	**High**	**Excessive**	
2004/05	2.0	5.1	26.5	29.6	24.5	12.2
2005/06	0.0	7.9	17.8	32.7	29.7	11.9
2006/07	5.0	7.5	20.0	38.8	20.0	8.8
2007/08	1.0	9.0	17.0	52.0	17.0	4.0
Source: AFBI						

- Soils excessively enriched with phosphorus (P-index > 3) declined from 37% in 2004/05 to 21% in 2007/08. This indicates better phosphorus management on the farm and may be a consequence of the recent reduction in the use of chemical phosphorus fertilisers in Northern Ireland.

- The decline in excessively enriched soils has been accompanied by an increase in the percentage of soils classed as high at P-index = 3 which has increased year on year from 30% in 2004/05 to 52% in 2007/08.

- The percentage of soils low in phosphorus (P-index 0 or 1) is relatively small and has not changed significantly over the years (7% in 2004/05 as opposed to 10% in 2007/08).

Sustainable Land Management

Figure 5.2 Northern Ireland agri-environment schemes, area under agreements, 2000 – 2007

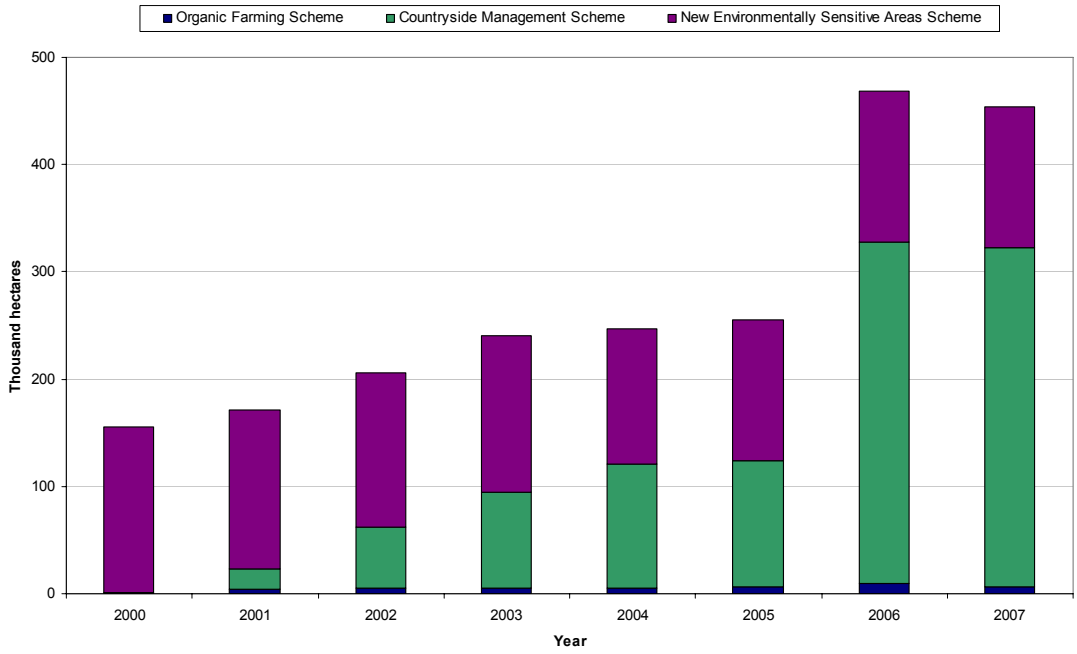

Table 5.2 Northern Ireland agri-environment schemes, area under agreements, 2000 – 2007

						Unit: Thousand hectares		
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Organic Farming Scheme	1	4	5	5	5	6	10	6
Countryside Management Scheme	n/a	19	57	90	116	118	318	317
New Environmentally Sensitive Areas Scheme	154	148	144	146	126	131	141	131
Source: DARD								

- The aim of agri-environment schemes is to enhance biodiversity, water quality, landscape and heritage features, and mitigate climate change by integrating sustainable environmental management into the everyday workings of the farm. In return for this, farmers and landowners receive a payment, based on the area of habitat and archaeological features present on the farm, and the area/length of habitat enhancement options carried out.

- In 2007, about 450,000 hectares (approximately 40%) of the farmed area in Northern Ireland was managed through the Countryside Management Scheme (CMS) and the Environmentally Sensitive Areas Scheme (ESAS).

- New CMS and Organic Farming Schemes (OFS) were launched in June 2008, with CMS applications being received during July and August 2008, and OFS applications being received during September and October.

Area of Woodland

Figure 5.3 Area of new forest and woodland plantings, 1998/99 – 2007/08

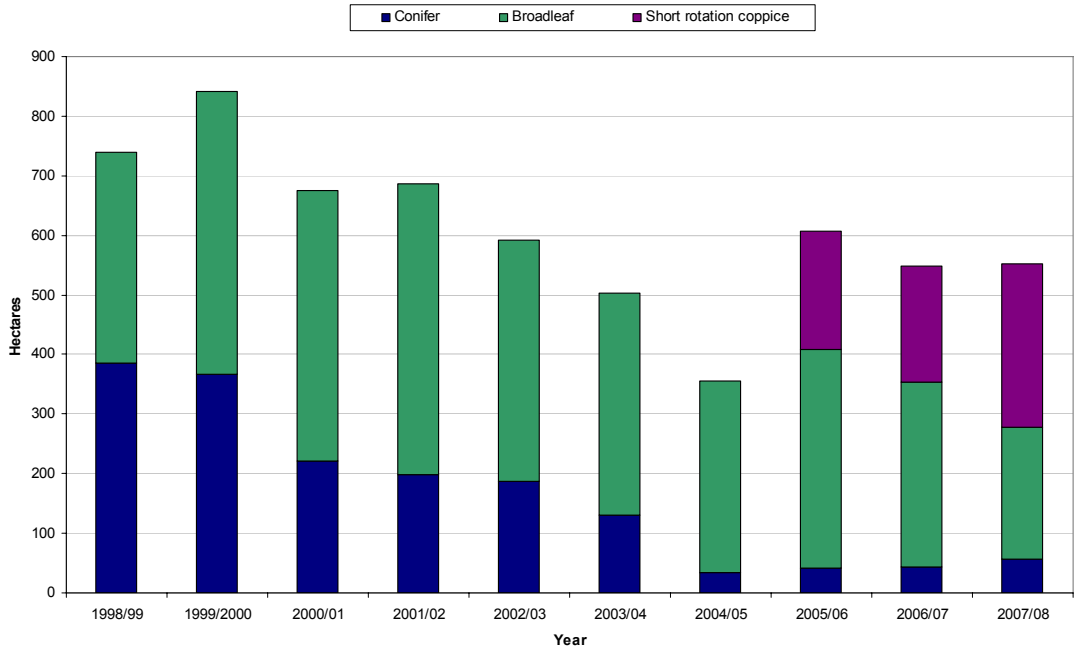

Table 5.3 Area of new forest and woodland plantings, 1998/99 – 2007/08

Unit: Hectares

	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Conifer	386	366	222	198	187	130	34	41	44	56
Broadleaf	354	476	453	488	405	373	321	367	310	221
Short rotation coppice	n/a	n/a	n/a	n/a	n/a	n/a	n/a	198	195	275

Source: Forest Service of Northern Ireland

- In Northern Ireland, over 70% of the woodlands and semi-natural forests are owned and managed by the Forest Service. The remainder is managed mostly by private landowners.

- In 2007/08, there were 552 hectares of new plantings. Of these, 97% were planted by the private sector supported by grant aid from the Forest Service.

- Short rotation coppice (SRC) is the practice of planting woody crops at high density which is harvested every 2 – 5 years. In Northern Ireland, SRC plantings have been counted separately since 2005, due to the introduction of a challenge fund specifically for SRC. These crops are grown for renewable energy purposes and they accounted for 50% of all new plantings in 2007/08.

- There has been a dramatic decrease in conifer plantings in the past 10 years. A shortage of suitable land at affordable prices has resulted in fewer conifer plantings by Forest Service in recent times. New planting is now generally restricted to smaller scattered areas of the countryside and broadleaves are normally preferred for landscape and environmental reasons.

Housing

Figure 5.4 Housing completions, 2000/01 – 2006/07

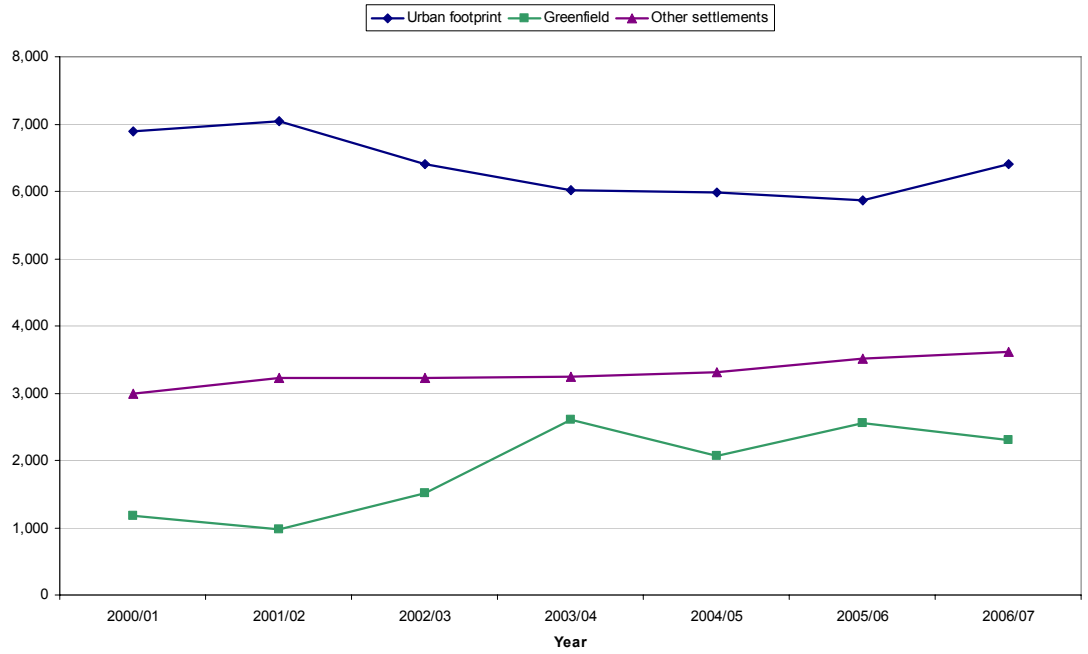

Table 5.4 Housing completions, 2000/01 – 2006/07

						Unit: Houses	
	2000/01	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**	**2006/07**
Urban footprint	6,894	7,043	6,403	6,009	5,978	5,858	6,401
Greenfield	1,182	973	1,505	2,604	2,061	2,563	2,306
Other settlements	2,994	3,226	3,232	3,244	3,305	3,515	3,617
Source: Planning Service							

- Housing completions and the residual land available for housing in settlements across Northern Ireland are monitored annually in accordance with the provisions of prevailing development plans.

- The data shows for each year, from 2000/01, the total number of housing completions within all settlements with a population greater than 5,000. These are broken down in terms of those completed within the urban footprints of settlements and those completed on greenfield sites, which are outside of urban footprints but within settlement limits.

- The data also shows the total number of houses completed in other settlements, which have a population less than 5,000.

- To date, the RDS regional target for 60% of additional dwellings to be provided within urban footprints has been more than achieved for each survey year since this monitoring commenced in 2000/01.

- There has been a rise in the proportion of housing completed on greenfield sites, increasing from 11% in 2000/01 to 19% in 2006/07.

6. Biodiversity

Biodiversity describes the vast range of living organisms on earth. Biological diversity has been defined as:

> "The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems."
>
> *Convention on Biological Diversity, 1992*

The state of our biodiversity is a cumulative measure of the relative state of our air, water and land environments. This chapter reports on the extent of nature conservation designations in Northern Ireland, the condition of some of these designations, wild bird populations, and the number of tree preservation orders imposed annually.

Habitats and species in Northern Ireland are protected by a series of statutory designations. These include Areas of Special Scientific Interest (ASSI), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites (areas of wetland and waterfowl conservation), National Nature Reserves, Marine Nature Reserves, and Local Nature Reserves. Protection is also afforded by non-statutory Sites of Local Nature Conservation Importance (SLNCI).

Wild bird populations are considered to be a good indicator of the broad state of the wildlife and the countryside. Figures over the last ten years indicate that Northern Ireland's wild bird population is increasing.

Tree preservation orders (TPO) are used by Planning Service to protect trees from being cut down or damaged. Trees provide a valuable habitat to a wide variety of species, and therefore the number of TPOs issued each year can be regarded as an indicator of one method of maintaining biodiversity.

Nature Conservation Designations

Figure 6.1 Area of nature conservation designations, 1998/99 – 2007/08

Table 6.1 Area of nature conservation designations, 1998/99 – 2007/08

								Unit: Thousand hectares		
	1998/99	**1999/2000**	**2000/01**	**2001/02**	**2002/03**	**2003/04**	**2004/05**	**2005/06**	**2006/07**	**2007/08**
ASSI	83.4	86.4	89.6	91.1	91.9	92.4	93.1	93.5	93.8	94.2
SAC	57.4	57.4	62.1	64.6	64.6	65.1	65.9	66.4	66.4	66.4
SPA	71.3	71.3	71.3	71.3	72.8	72.8	72.8	108.8	108.8	108.8
Ramsar	73.6	76.1	76.1	76.1	76.2	76.2	76.2	77.4	77.5	77.5
Source: NIEA										

- Identifying and protecting areas of natural and semi-natural scientific interest and the flora and fauna they support has been a cornerstone of nature conservation action in the UK during the last 50 years. Some sites are deemed of such importance that they are formally designated under a number of pieces of national and international legislation.

- Many areas in Northern Ireland have been designated to protect their nature conservation value. Sites include land, freshwater, coastal and marine areas.

- At 31 March 2008, a total of 94,200 hectares had been declared as ASSIs, 66,400 hectares as SACs, 108,800 hectares as SPAs and 77,500 hectares as Ramsar sites. There is some overlap of area between these different types of designation and therefore, these cannot be totalled to give an absolute figure on the extent of designations.

- In 2005/06, two large SPAs were declared, adding a total of 36 thousand hectares to the SPA designation.

Nature Conservation Designations

Figure 6.2 Condition of features within Areas of Special Scientific Interest (ASSI), for the 6 year rolling period ending March 2008

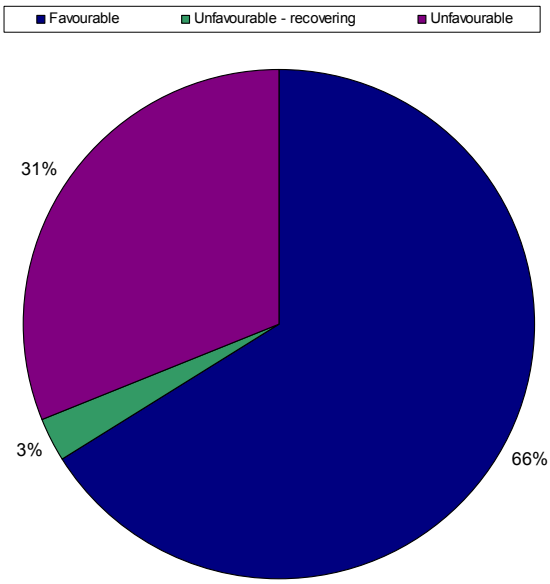

Table 6.2 Condition of Features within Areas of Special Scientific Interest (ASSI), for the 6 year rolling period ending March 2008

	Favourable	Unfavourable - recovering	Unfavourable	All conditions
Number of features	606	26	284	916
Percentage	66	3	31	100
Source: NIEA				

- Areas of Special Scientific Interest (ASSIs) are designated sites which are protected under Northern Ireland law for their nature and earth science value. They are selected based on specific qualifying features which include earth science features, habitats and species. The condition of these features are assessed over a six year monitoring programme.

- The first full cycle was completed in March 2008 during which 916 features from 195 ASSIs were assessed.

- The results show that two-thirds of the features are in favourable condition. However, 31% of features are in an unfavourable condition.

- As this is only the first full monitoring round, we can make no comments about trends.

Wild Birds

Figure 6.3 Wild bird populations in Northern Ireland, 1998 – 2007

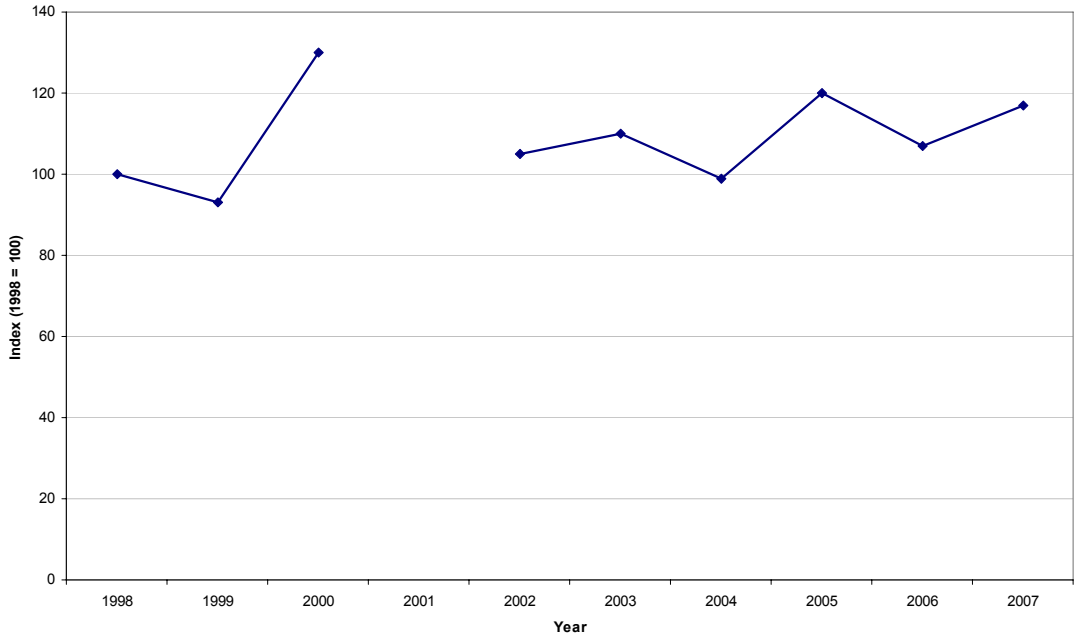

Table 6.3 Wild bird populations in Northern Ireland, 1998 – 2007

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Index (1998 = 100)	100	93	130	n/a	105	110	99	120	107	117
Source: British Trust for Ornithology										

- Northern Ireland's wild bird population is monitored as part of the UK Breeding Bird Survey, which is undertaken annually at nearly 3,000 sites across the UK.
- In Northern Ireland, information on trends is only available for the 28 most common species.
- The wild bird population in Northern Ireland is estimated to have increased by 17% in the last 10 years.
- There is no figure for 2001, due to the impact that the foot and mouth outbreak had on the collection of data, i.e. monitors not being able to access many rural areas, and as such a much smaller sample being taken.

Sites of Local Nature Conservation Importance

Figure 6.4 Number of Sites of Local Nature Conservation Importance (SLNCI) adopted or proposed in area plans, 2000 – 2007

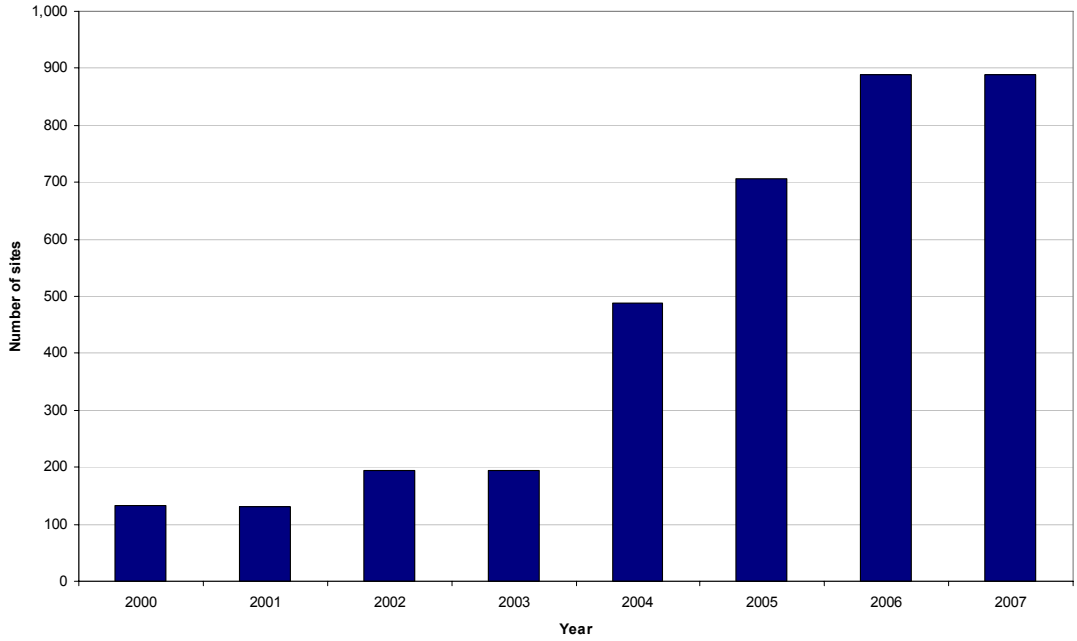

Table 6.4 Number of Sites of Local Nature Conservation Importance (SLNCI) adopted or proposed in area plans, 2000 – 2007

							Unit: Number of sites	
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Cumulative total	133	130	194	194	488	706	889	889
Source: NIEA								

- Sites of Local Nature Conservation Importance (SLNCIs) are published in development / area plans and are afforded protection under Planning Policy Statement (PPS) 2.

- Prior to an area plan being published, Planning Service request that NIEA provide information on sites which contain substantive local nature conservation value. Where such sites are identified, area plans will set out specific planning policies which will apply to development proposals on those sites.

- Unlike ASSIs, the condition of SLNCIs is not routinely monitored.

- The number of SLNCIs has increased from 133 in 2000 to 889 in 2007. The number of proposed or adopted SLNCI's is linked to the publication of area plans. Subsequently, as future area plans are published, the number of SLNCI's will increase.

Tree Preservation Orders

Figure 6.5 Number of imposed Tree Preservation Orders (TPO), 2003 – 2007

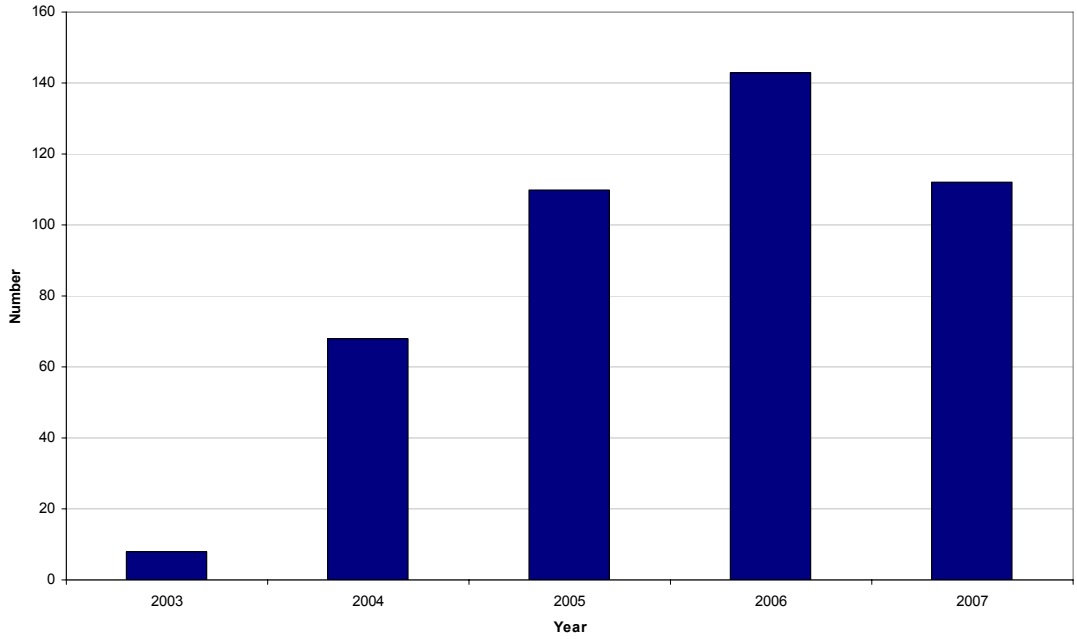

Table 6.5 Number of imposed Tree Preservation Orders (TPO), 2003 – 2007

					Unit: Number
	2003	**2004**	**2005**	**2006**	**2007**
TPOs imposed	8	68	110	143	112
Source: Planning Service					

- Planning Service has the authority to protect trees by making Tree Preservation Orders (TPO). The issuing of a TPO makes it an offence to cut down, top, lop, uproot, wilfully damage or destroy any protected tree(s) without first having obtained permission from the local authority.

- All types of tree can be protected in this way, whether as single trees or as part of a woodland, copse or other grouping of trees. Protection does not extend to hedges, bushes or shrubs.

- Between 2003 and 2007, Planning Service have imposed a total of 441 TPOs. Of those, 112 were imposed in 2007.

- The reason for the marked increase in the numbers of TPOs issued in more recent years may be due to a variety of different factors, such as changes in regional planning policy; increasing awareness in the value of trees; or an increase in the amount of development going on in the countryside generally.

7. Built Heritage

Northern Ireland has a rich heritage of archaeological sites and buildings representing past human endeavours, providing evidence of settlement, agricultural, industrial and ritual activity from 9,000 years ago to the present day. This chapter looks at the numbers of scheduled monuments and listed buildings in Northern Ireland, including those which are at risk, and the number of conservation areas.

There are upwards of 35,000 historic monuments and sites in Northern Ireland dating from 9,000 years ago to the recent past. Monuments are chosen each year for scheduling and some of these are entered into the Built Heritage at Risk in Northern Ireland (BHARNI) register.

In 2007/08, there were a total of 1,757 scheduled monuments. The condition of these scheduled monuments is assessed regularly, and results of a survey which include them will be published in 2009 by NIEA in the Condition and Management Survey of the Archaeological Resource (CAMSAR) for Northern Ireland.

Listed buildings are those of special architectural or historic interest, and provide an indication of the extent of this historical architectural resource. Since 2003 there has been a modest increase in the number of listed buildings with a total of 8,248 buildings recorded by the NIEA in 2007/08. Because some listings include multiple buildings the total number of buildings protected in this way is estimated to be around 8,500 structures.

Buildings classified as at risk in Northern Ireland and recorded on the NIEA online database BHARNI, are those most at risk from deterioration or demolition. In 2007/08, there were 417 listed buildings and structures on the BHARNI database.

There are currently 60 designated conservation areas in Northern Ireland. These are defined as areas of special architectural or historic interest.

Monuments

Figure 7.1 Number of scheduled monuments, 1998/99 – 2007/08

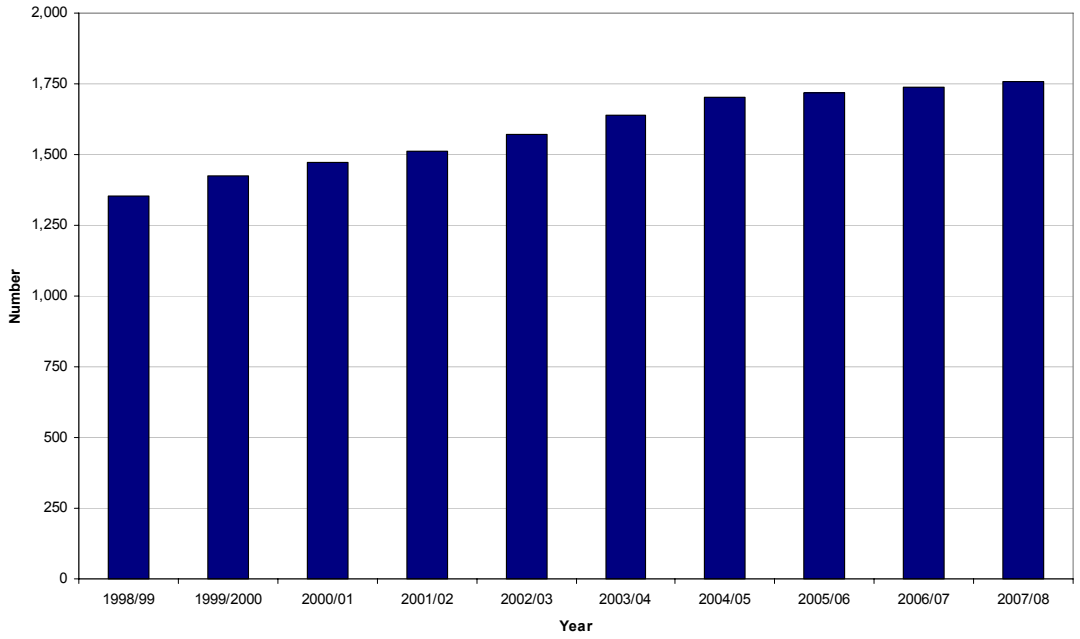

Table 7.1 Number of scheduled monuments, 1998/99 – 2007/08

Unit: Number

	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Number of scheduled monuments	73	70	50	40	60	66	65	14	20	20
Cumulative total	1,353	1,423	1,473	1,513	1,573	1,639	1,704	1,718	1,738	1,757

Source: NIEA

Note: One monument was descheduled in 2007/08

- Scheduled Historic Monuments include settlements, defences, workplaces, and sites for ritual, worship and burial.
- There has been a decrease in the number of monuments being scheduled each year in Northern Ireland with 73 monuments being scheduled in 1998/99 and 20 or less scheduled in each of the last three years.
- However, overall there has been an increase in the total number of scheduled monuments rising to 1,757 in 2007/08 compared to 1,353 in 1998/99.

Listed Buildings

Figure 7.2 Number of listed buildings, 2003/04 – 2007/08

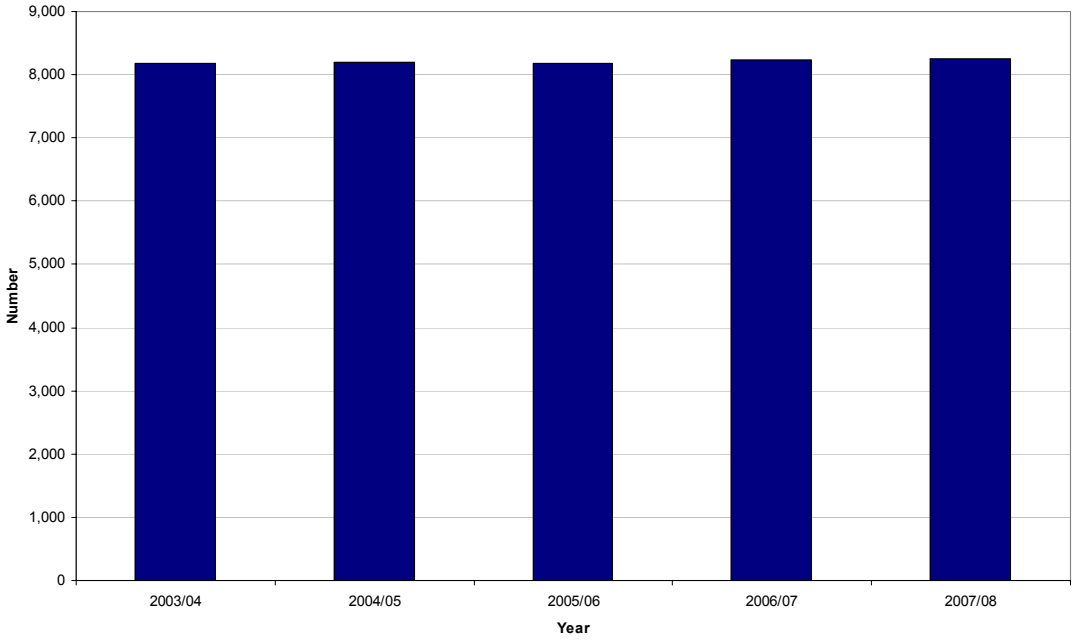

Table 7.2 Number of listed buildings, 2003/04 – 2007/08

				Unit: Number	
	2003/04	**2004/05**	**2005/06**	**2006/07**	**2007/08**
Number of listed buildings	8,184	8,206	8,177	8,242	8,248
Source: NIEA					

- The Planning (Northern Ireland) Order 1991, enables lists of buildings of special architectural or historic interest to be compiled by NIEA.
- There has been a modest increase in the number of buildings listed in recent years with a total of 8,248 statutory listings in 2007/08.
- A second, area based survey of all historic buildings (The Second Survey) has been underway since 1997 and is largely responsible for this increase. However, it should be noted that a significant number of buildings have also been found which no longer meet the legislative test and have therefore been removed.
- Because some listings include multiple buildings, such as terraces or farm buildings under a single listing reference, the total number of structures is greater than the figure given and is estimated to be around 8,500.

Listed Buildings

Figure 7.3 Number of buildings at risk, 2003/04 – 2007/08

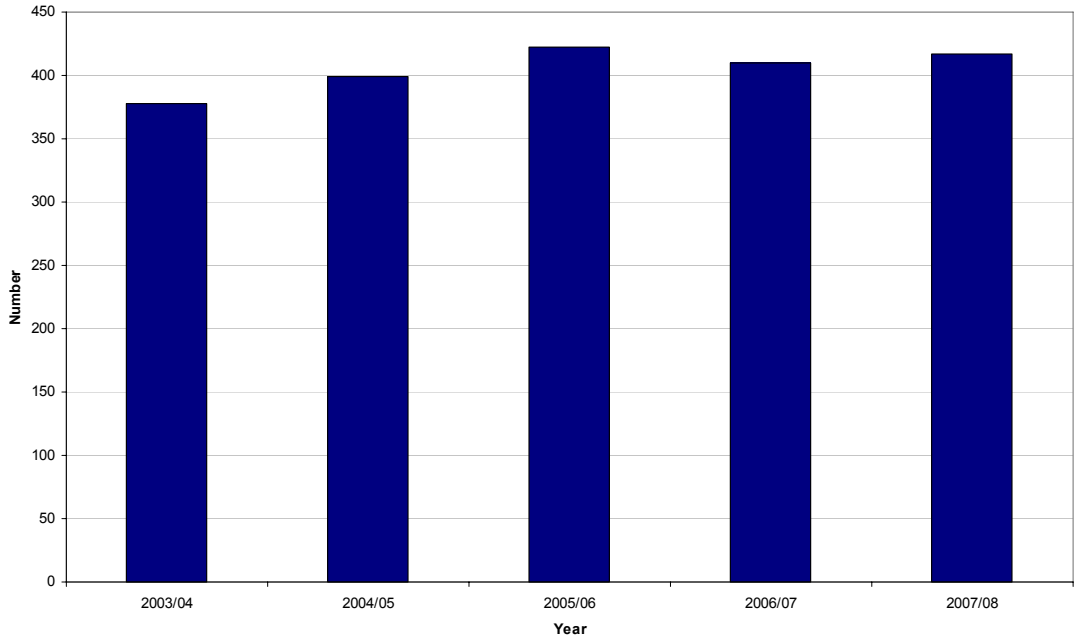

Table 7.3 Number of buildings at risk, 2003/04 – 2007/08

					Unit: Number
	2003/04	**2004/05**	**2005/06**	**2006/07**	**2007/08**
Number of buildings at risk	378	399	422	410	417
Source: NIEA					

- A listed building or structure is at risk when its condition and management is deemed to be poor and unsustainable, placing the building or structure under threat of deterioration and/or demolition.

- Such listed buildings, structures and some scheduled monuments are recorded on an on-line database Built Heritage at Risk in Northern Ireland (BHARNI) register.

- The BHARNI register provides an indicator of changes in the number of buildings judged to be at risk. In 2007/08, there were 417 buildings and structures on the BHARNI database. In total, 32 listed buildings were removed from the database and were no longer at risk.

- The Sustainable Development Strategy sets a target of removing 200 buildings from the BHARNI register (based on 2006 figure) by 2016. However, as the collection of data is ongoing it is expected that numbers of buildings identified as being at risk will continue to rise in the initial years as this work is completed.

Conservation Areas

Figure 7.4 Number of conservation areas, 2002/03 – 2007/08

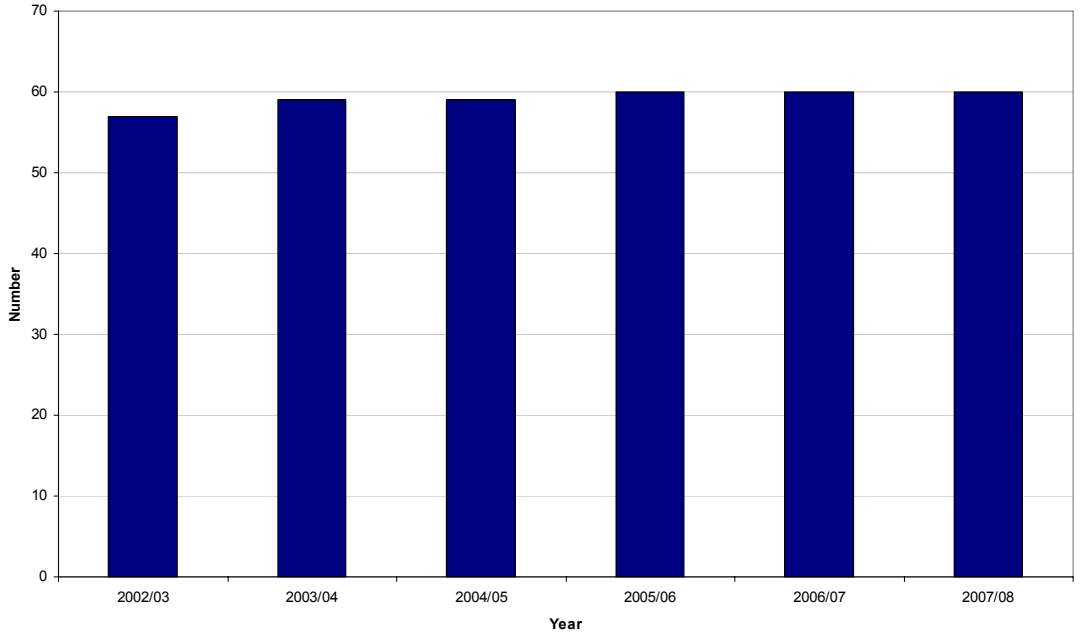

Table 7.4 Number of conservation areas, 2002/03 – 2007/08

					Unit: Number	
	2002/03	**2003/04**	**2004/05**	**2005/06**	**2006/07**	**2007/08**
Conservation areas	57	59	59	60	60	60
Source: Planning Service						

- Planning Service and NIEA are both within the Department of the Environment. Planning Service is responsible for area based heritage controls.

- Planning Service has been responsible for the designation of Conservation Areas since 1995. These are defined as areas of special architectural or historic interest.

- Since 1975, the Department of the Environment has designated 60 conservation areas in Northern Ireland. They range in scale from city and town centres to villages and relatively small residential parks and streets.

8. Waste

Waste and, especially, how we deal with it, is becoming an increasingly important issue. Waste is produced by households, by industrial processes, by the construction and demolition industry, through commercial activities and agricultural practices and by public services and utilities. This chapter reports on the amount of municipal waste produced, the amount of municipal waste recycled and recovered and the amount of waste produced per household.

Waste can impact on the environment through the visual impact it can have, through emissions to the air, emissions to groundwater and surface water and contamination of land. Municipal waste is defined as all of the waste collected from households and commercial premises that comes under the control or possession of the local authorities.

In Northern Ireland, the amount of municipal waste we produce has remained fairly constant since 2004/05. The majority of waste is sent to landfill, with 71% of municipal waste in 2007/08 landfilled. Landfilled biodegradable waste emits methane and carbon dioxide into the atmosphere as it decomposes and leachate is produced when water filters down through a landfill.

Recycling of waste is becoming much more common in Northern Ireland. The Northern Ireland Waste Management Strategy (2006) set a target that 35% of household waste should be recycled or composted by 2010. In 2007/08, 32% of household waste was recycled or composted and 29% of municipal waste was recycled or composted.

The amount of waste produced per household has remained fairly constant at 1.29 tonnes per year, which equates to approximately 25kg per week.

Waste Arisings

Figure 8.1 Municipal waste arisings, 2004/05 – 2007/08

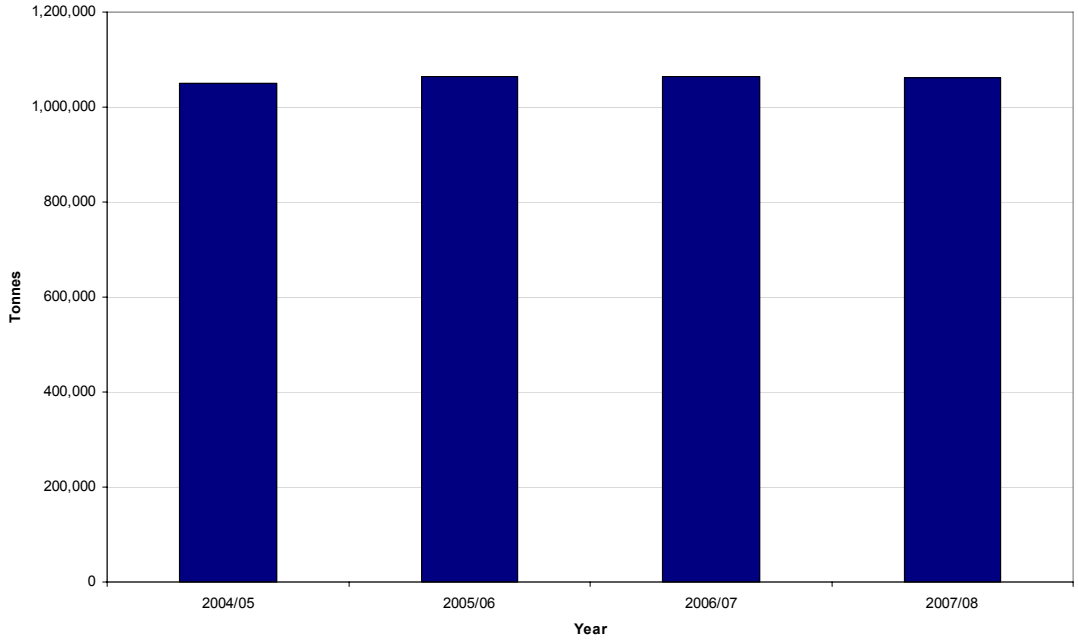

Table 8.1 Municipal waste arisings, 2004/05 – 2007/08

				Unit: Tonnes
	2004/05	**2005/06**	**2006/07**	**2007/08**
Municipal waste arisings	1,050,716	1,063,510	1,064,090	1,061,108
Source: NIEA				

- Municipal waste in Northern Ireland is defined as all of the waste from households and commercial premises that comes under the control or possession of each of the 26 district councils. It is predominantly made up of waste collected from households, but also includes waste collected from civic amenity sites and some commercial waste.

- Municipal waste data for Northern Ireland is collected via quarterly data returns submitted by all district councils through the WasteDataFlow system.

- In 2007/08, there was 1,061,108 tonnes of municipal waste arisings in Northern Ireland, a slight decrease on the amount of arisings in 2006/07.

Waste Recycled or Composted

Figure 8.2 Municipal waste recycled or composted, 2004/05 – 2007/08

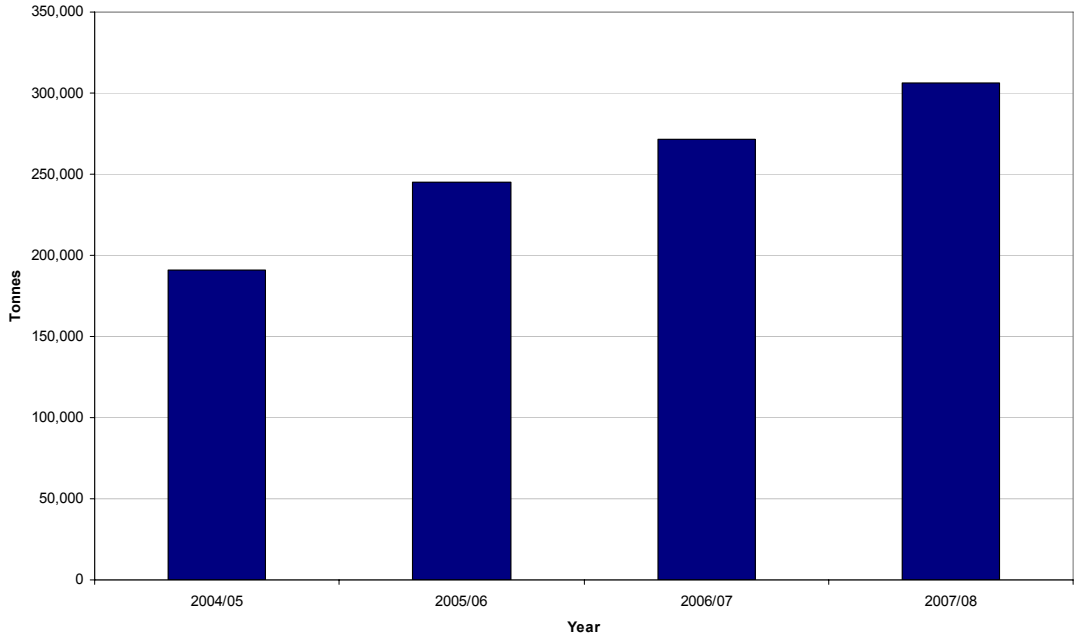

Table 8.2 Municipal waste recycled or composted, 2004/05 – 2007/08

			Units: Tonnes	
	2004/05	**2005/06**	**2006/07**	**2007/08**
Municipal waste recycled or composted	191,197	244,811	271,730	306,021
Source: NIEA				

- The management of municipal waste in Northern Ireland is through recycling, composting and landfill, with a small portion being sent for reuse (6,047 tonnes).

- Recycling and composting is based on kerbside collections, materials brought to civic amenity sites, materials brought to bring sites and materials collected by a third party, such as charities/voluntary groups.

- In 2007/08, 306,021 tonnes of municipal waste was sent for recycling or composting.

- There has been a steady increase in the amount of municipal waste sent for recycling or composting since 2004/05. The amount collected has increased by 60% on the 2004/05 level, and the proportion of municipal waste recycled or composted has increased from 18% in 2004/05 to 29% in 2007/08.

Household Waste

Figure 8.3 Household waste collected per household per year, 2004/05 – 2007/08

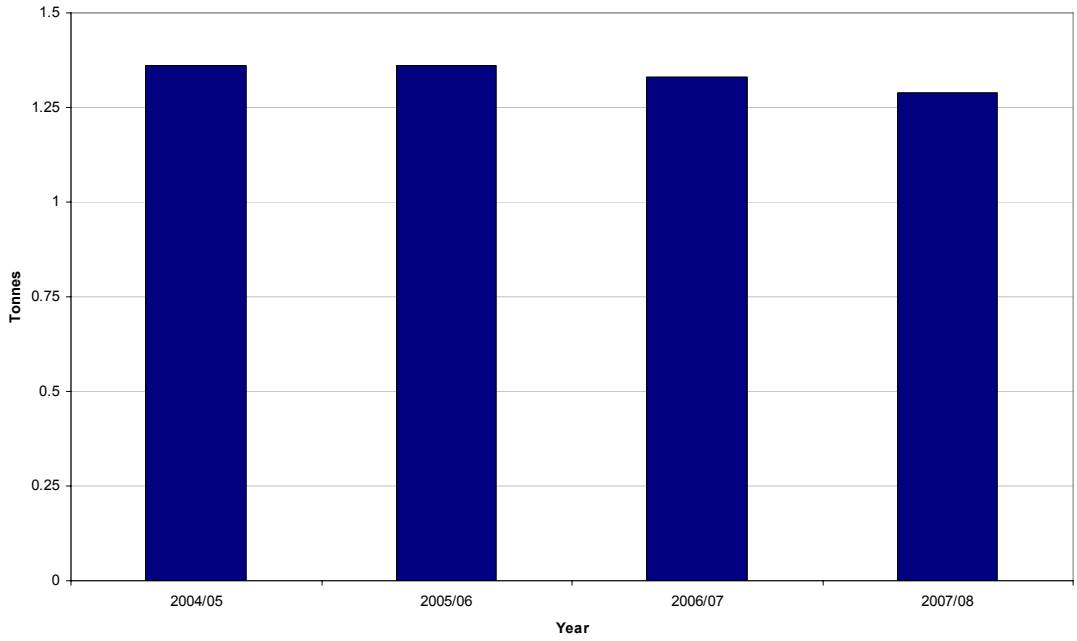

Table 8.3 Household waste collected per household per year, 2004/05 – 2007/08

				Unit: Tonnes
	2004/05	**2005/06**	**2006/07**	**2007/08**
Household waste per household per year	1.36	1.36	1.33	1.29
Source: NIEA				

- Household waste is one element of municipal waste collected, and is recorded using the WasteDataFlow system as the amount of waste collected by the district council's regular household collections, kerbside collection, civic amenity and bring site collections.

- In 2007/08, there was a total of 928,122 tonnes of household waste collected.

- In 2007/08, this was the equivalent of 1.29 tonnes of household waste per household per year, a 5% decrease on the 2004/05 figure of 1.36 tonnes of household waste per household per year.

Appendix

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Further Information

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Households: http://www.nisra.gov.uk/demography/default.asp21.htm

Environmental pressures: http://www.drdni.gov.uk/index/statistics/stats-catagories.htm

Public opinion: http://www.csu.nisra.gov.uk/survey.asp2.htm

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Air Quality: http://www.airqualityni.co.uk/

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Conservation areas:
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All indicators: http://www.ni-environment.gov.uk/waste/municipal_data_reporting.htm