

Northern Ireland Environmental Statistics Report

May 2021



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**Agriculture, Environment
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Northern Ireland
**Environment
Agency**



Biodiversity - Terrestrial

Terrestrial protected sites under favourable management.

2.63 km² Baseline 2015/16. **304.04 km²** 2020/21.

+
Positive change



Biodiversity - Marine

Marine protected sites under favourable management.

83.62 km² Baseline 2015/16. **115.00 km²** 2020/21.

+
Positive change



Air Quality

Annual mean concentration of nitrogen dioxide (NO₂).

35.6 µg/m³ Baseline 2014. **24.3 µg/m³** 2020.

+
Positive change




Waste

Household waste recycling rate.

42.0% Baseline 2014/15. **51.9%** 2019/20.

+
Positive Change



Climate Change

Total greenhouse gas emissions in NL.

19.8 MtCO₂e Baseline 2014. **19.4 MtCO₂e** 2018.

=
No Change



Water Quality - Rivers

Soluble reactive phosphorus (SRP) in rivers.

0.059 mg/l Baseline 2015. **0.067 mg/l** 2020.

=
No Change



Water Quality - Marine

Winter Dissolved Inorganic Nitrogen (DIN).

26.45 µM Baseline 2015. **26.2 µM** 2020.

=
No Change

Key Points

Air & Climate

- In 2020, the mean nitrogen dioxide level for the ten sites used for Programme for Government (PfG) reporting was 24.3µg/m³. This was 11.3µg/m³ less than the level reported in 2014, a positive change from the baseline year.

Water and Marine

- In 2020 Soluble Reactive Phosphorus (SRP) was measured at 93 surveillance rivers across Northern Ireland giving an average concentration of 0.067 mg/l of phosphorus in river water. This was 0.008 mg/l more than the level reported in 2015 and considered to be no change since the baseline year for PfG reporting.
- In 2020, winter Dissolved Inorganic Nitrogen (DIN) was recorded at 26.2 µM. This is considered to be no change since 2015, the baseline year for PfG reporting.

Biodiversity

- In 2020/21, the area of terrestrial protected sites under favourable management in Northern Ireland was recorded as 304.04 km². This was 301.41 km² greater than the baseline year for PfG reporting (2015/16), a positive change.
- In 2020/21, the area of marine protected sites under favourable management in Northern Ireland was recorded as 115.00 km². This was 31.38 km² greater than the baseline year for PfG reporting (2015/16), a positive change.

Public Attitudes

- The level of public concern about environmental issues was high in 2020/21, with 82 per cent very or fairly concerned about the environment.
- Illegal dumping of waste and litter was the biggest environmental concern for households in Northern Ireland in 2020/21.

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Issued by:

Statistics and Analytical Services Branch
Department of Agriculture, Environment
and Rural Affairs (DAERA), Room 816,
Dundonald House
Belfast BT4 3SB

Contact: David Finlay

Telephone: 028 90525450

Email: env.stats@daera-ni.gov.uk

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Introduction

This compendium report provides information on a range of environmental indicators for seven main topics: Public attitudes, Climate Change, Air, Water and Marine, Biodiversity and Land, Waste and finally Built Heritage. The indicators presented are based on the most recently available data at the time of publication with most providing data on trends over time and where applicable, performance against quantified targets. The indicators that are included were determined in agreement with key data providers, policy colleagues and other interested parties. The report also collates all Programme for Government (PfG) population indicators, which DAERA have primary responsibility to report on, into one publication.

This report provides some commentary on each of the indicators and describes any trends that they illustrate. All figures in the report, apart from those with maps only, have corresponding tables which can be found in the associated [data tables](#) available online.

This report is updated annually and each year the indicators are reviewed for their usefulness and relevance. Additional indicators will also be considered for future years. A major rationalisation of the report was completed in 2020 to concentrate on those statistics that are first released in this report and those statistics that are produced for PfG monitoring. If you have any comments on the indicators currently published or suggestions for future reports please send the details to the contact listed at the beginning of the report.

Reader Information

This document may be made available in alternative formats, please contact us to discuss your requirements. Definitions of key terms used in this publication are available in the [User Guidance](#).

Purpose

This is an annual publication which provides information on a range of environmental indicators in Northern Ireland.

The data contained are used to measure progress towards achieving targets from various strategies including:

- EU Air Quality Directives
- Water Framework Directive
- Programme for Government Framework 2016-2021

The data are also used by media, the general public and special interest groups to inform policy and lifestyle choices related to the environment.

Next Updates

- This report is published annually with the next update scheduled for May 2022.
- The scheduled dates for all upcoming publications are available from the GOV.UK statistics release calendar: <https://www.gov.uk/government/statistics>

1 Public Attitudes

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 looks at our changing attitudes towards the environment and signpost the reader to information on Northern Ireland's changing population and environmental pressures.

Key points in this chapter:

- The level of public concern about environmental issues was high in 2020/21, with 82 per cent very or fairly concerned about the environment.
- Illegal dumping of waste and litter was the biggest environmental concern for households in Northern Ireland in 2020/21.
- The most common actions taken by households for environmental reasons in 2020/21 were reusing, recycling and disposing of waste products appropriately and reducing food waste.
- The majority of households paid 50p or less for the last carrier bag they bought.

Other sources of information published elsewhere which illustrate the various pressures on the environment are provided below.

Both population and number of households in Northern Ireland show increasing trends. The number of households has tended to increase at a faster rate than the population resulting in a declining number of people per household. NISRA provide information on population projections as well as an annual update of their mid-year estimates.

[NISRA population statistics](#)

Prior to the Covid-19 pandemic, air passenger numbers have increased over the recent years in Northern Ireland with the advent of low-fare airlines a major factor in this. The Civil Aviation Authority produces [air traffic statistics](#) including the number of passengers departing from individual UK airports.

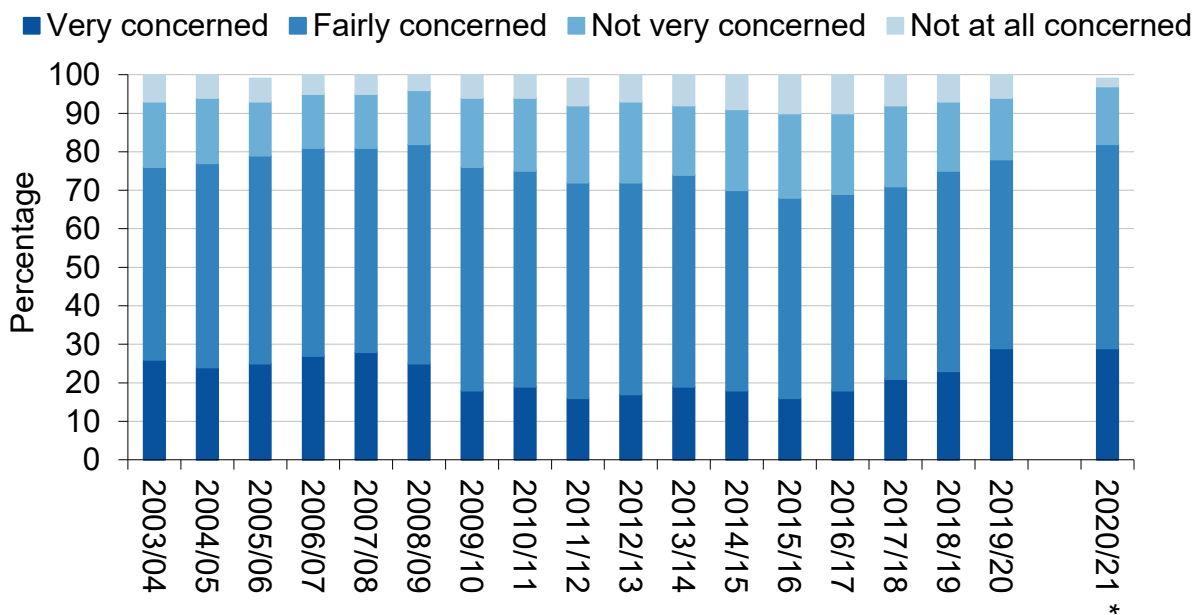
Car travel continues to dominate the way we do most of our day-to-day travelling. Information on how and why people travel in Northern Ireland including the number of journeys per person, average distance travelled can be sourced from the Department of Infrastructure [statistics and research](#) section.

The number of carrier bags dispensed by retailers under the carrier bag levy in Northern Ireland continue to decline. The latest statistics can be found in the [carrier bag levy annual report](#).

[Data tables](#) and further information for this chapter can be found online.

Level of Concern for the Environment

Figure 1.1 Level of concern for the environment, 2003/04 – 2020/21*



Source: Continuous Household Survey, NISRA

* Caution should be used when comparing 2020/21 data to previous years due to a reduced response rate and methodology changes caused by the Covid-19 pandemic.

Note: Provisional data. Finalised information published in July 2021.

Due to changes in the data collection methodology to telephone interviewing in response to the covid-19 pandemic and a significant reduction in the sample and number of responses, caution should be used when comparing to previous years.

Northern Ireland households were asked to provide their views on environmental issues in NISRA's Continuous Household Survey (CHS)¹.

In 2020/21, the proportion of respondents very or fairly concerned about the environment was 82 per cent. Whilst this matched the previous highest figure recorded in 2008/09, caution should be used when comparing 2020/21 data to previous years due to changes introduced to the survey in response to the Covid-19 pandemic as outlined above and in the ESR user guidance.

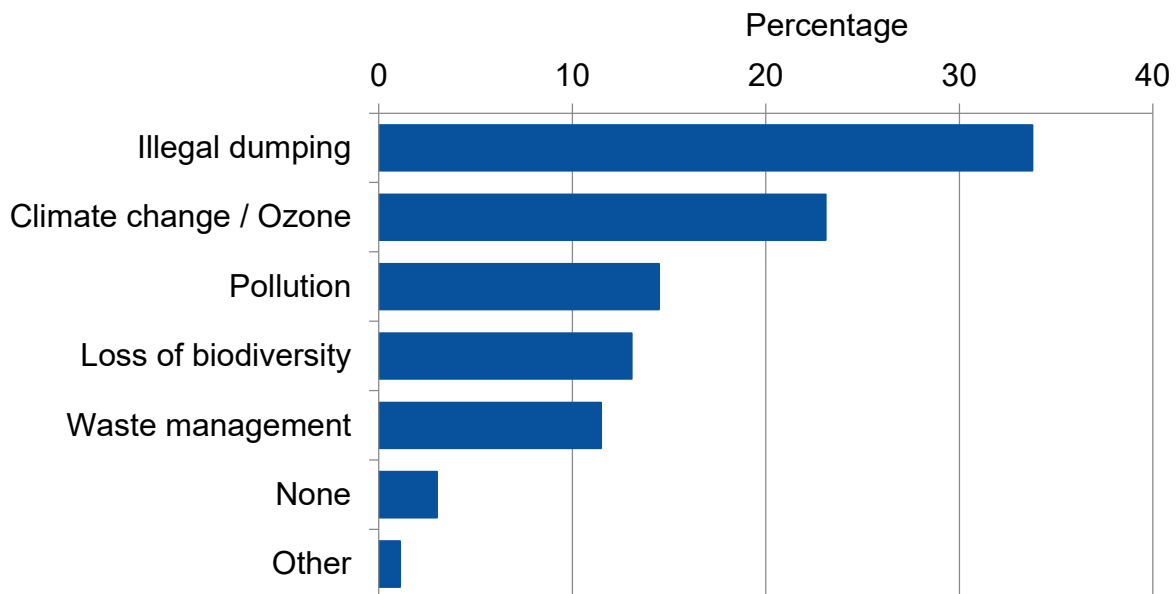
When broken down by age and sex, 84 per cent of females were very or fairly concerned about the environment compared to 81 per cent of males, whilst those aged 16-34 were less likely to be very or fairly concerned about the environment compared to other age categories.

Charts providing a breakdown of 2020/21 data by age and sex are available in the accompanying [data tables](#).

¹ <https://www.nisra.gov.uk/publications/chs-survey-documents>

Environmental Problems Considered Most Important

Figure 1.2 Environmental problems considered most important, 2020/21



Source: Continuous Household Survey, NISRA

Note: Provisional data. Finalised information published in July 2021.

Due to changes in the data collection methodology to telephone interviewing in response to the covid-19 pandemic and an associated reduction in the number of response categories to consider, 2020/21 data are not directly comparable to the previous environmental problems question.

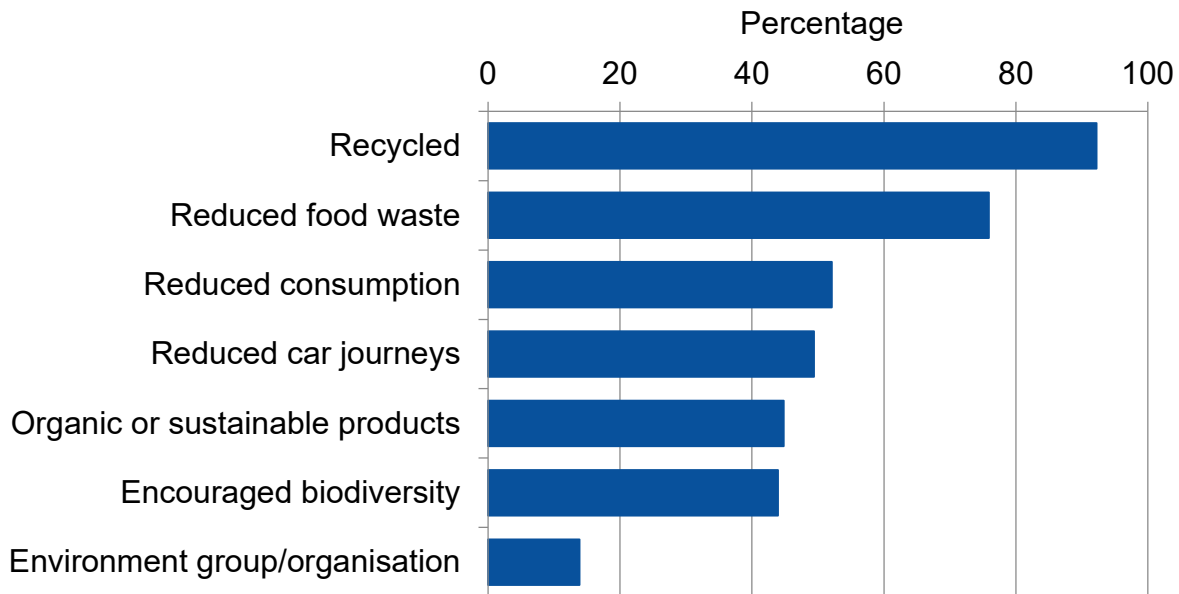
Households were asked to consider the list of environmental problems specified in Figure 1.2 and state which, if any, they thought was the most important issue to them. Results show that in 2020/21, the most commonly selected environmental problems were illegal dumping of waste and litter (34 per cent), Climate change and ozone layer depletion (23 per cent) and pollution of air, water and soil (14 per cent).

When analysed by age, respondents aged 55+ were more likely to select illegal dumping of waste and litter as the most important issue than other age categories.

Charts providing a breakdown of 2020/21 data by age and sex are available in the accompanying [data tables](#).

Actions Taken That Have a Positive Impact on the Environment

Figure 1.3 Actions taken that have a positive impact on the environment, 2019/20



Source: Continuous Household Survey, NISRA

Note: Provisional data. Finalised information published in July 2021.

Due to changes in the data collection methodology to telephone interviewing in response to the covid-19 pandemic and an associated reduction in the number of response categories to consider, 2020/21 data are not directly comparable to the previous environmental actions question.

The survey asked respondents what actions they had taken in the last 12 months that had a positive impact on the environment.

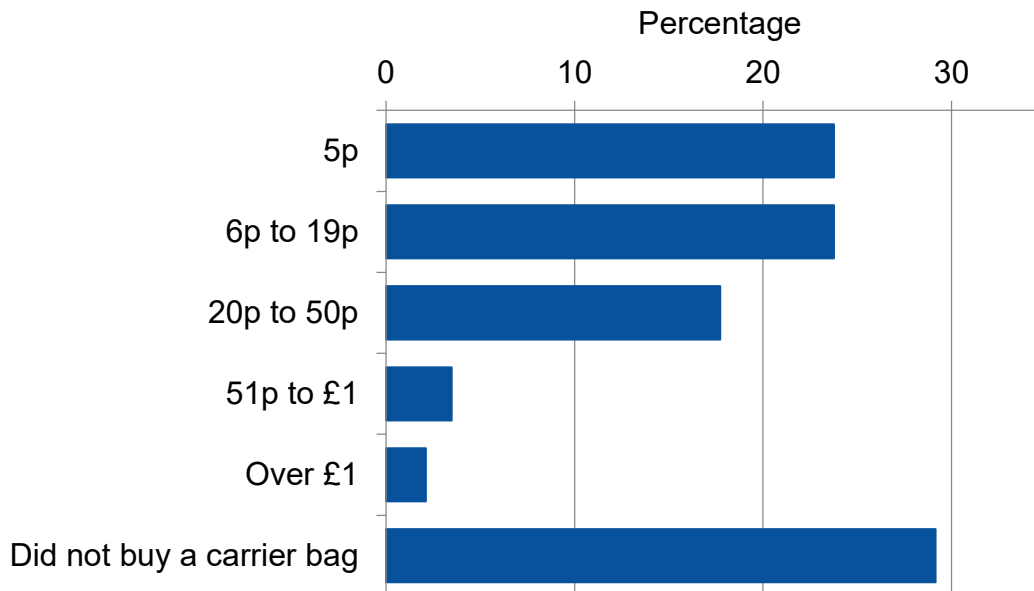
Results indicate that in 2020/21, the top three actions taken by households were: reused, recycled and disposed of waste products appropriately (92 per cent); reduced food waste (76 per cent) and reduced consumption of household utilities (52 per cent).

Females were more likely to take action to reduce food waste, 80 per cent compared to 72 per cent of males. Respondents aged 16-34 were more likely to have bought organic or sustainable products than older age categories.

Charts providing a breakdown of 2020/21 data by age and sex are available in the accompanying [data tables](#).

Amount Paid for the Last Carrier Bag Bought

Figure 1.4 Amount paid for the last carrier bag bought, 2020/21



Source: Continuous Household Survey, NISRA

Household respondents were asked how much they paid for the last carrier bag they bought.

Almost one in three (29 per cent) responded that they did not buy a carrier bag, whilst 24 per cent bought bags costing 5 pence with another 24 per cent buying bags costing 6p – 19 pence.

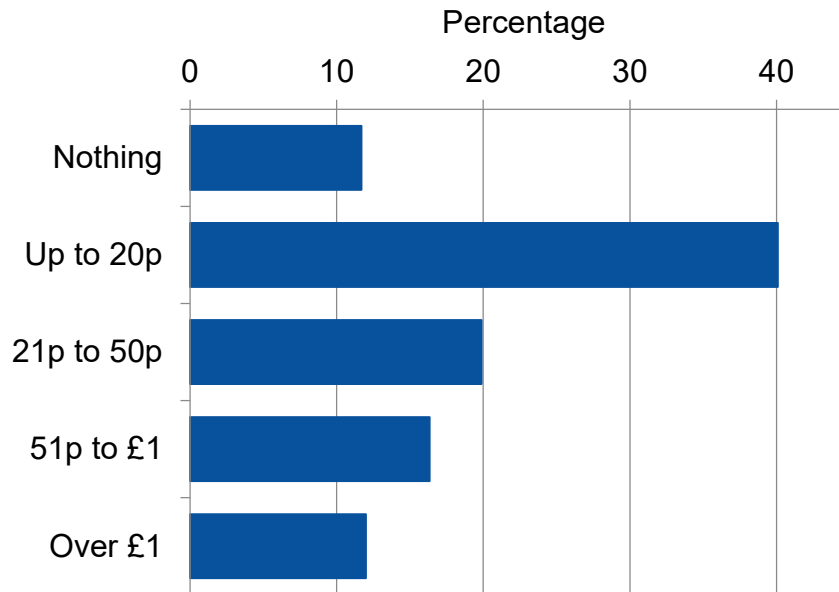
Females were less likely to have bought a carrier bag than males with 31 per cent responding that they did not buy a carrier bag compared to 27 per cent of males.

When analysing by age, respondents aged 16-34 were more likely to purchase a bag costing less than 20 pence compared to other age groups. Those aged 55+ were the least likely to buy any carrier bag.

Charts providing a breakdown of 2020/21 data by age and sex are available in the accompanying [data tables](#).

Most You Would be Willing to Pay for a Carrier Bag

Figure 1.5 Most you would be willing to pay for a carrier bag, 2020/21



Source: Continuous Household Survey, NISRA

Household respondents were asked what was the most they would be willing to pay for a carrier bag. The highest number of respondents selected that they would be willing to pay up to 20 pence (40 per cent) with 20 per cent selecting 21p – 50p.

Male respondents were more likely to select the lower price range of carrier bags whereas a higher proportion of females were willing to pay for a more expensive carrier bag costing over 50 pence. For example, 35 per cent of females were willing to pay over 50 pence for a carrier bag compared to 22 per cent of males.

Almost one in five respondents aged 55+ indicated that they would not pay for a carrier bag (19 per cent) if possible.

Charts providing a breakdown of 2020/21 data by age and sex are available in the accompanying [data tables](#).

2 Climate Change

Climate change is one of the most serious threats we face today, not only to our environment, but to our economic prosperity and global security and has the power to affect us no matter where we live. The overwhelming scientific evidence from the Intergovernmental Panel on Climate Change (IPCC) fifth assessment report has highlighted the dramatic changes to our climate and their causes.

Northern Ireland faces changes to its climate over the next century. Projections suggest that we may face hotter, drier summers and warmer, wetter winters as a result of climate change. This chapter will report on greenhouse gas emissions and present a time series of temperature and rainfall data calculated using Armagh Observatory temperature records.

Key points in this chapter:

- In 2018, Northern Ireland's greenhouse gas emissions were estimated to be 19.4 MtCO₂e, a reduction of 20.0 per cent since 1990. The figure of 19.4 MtCO₂e is a decrease of 2.1 per cent since the baseline year for PfG reporting (2014) and therefore is considered as no change for PfG reporting.
- Climate records suggest that the mean annual temperature has been steadily increasing since the end of the 19th century. The number of days per year where the temperature exceeded 20°C has also been increasing in the same timescale.

Other sources of information published elsewhere provide further details of greenhouse gas emissions and efforts to reduce the quantities emitted in Northern Ireland.

[Agriculture, transport and energy supply](#) were the largest contributing sectors to greenhouse gas emissions in Northern Ireland in 2018.

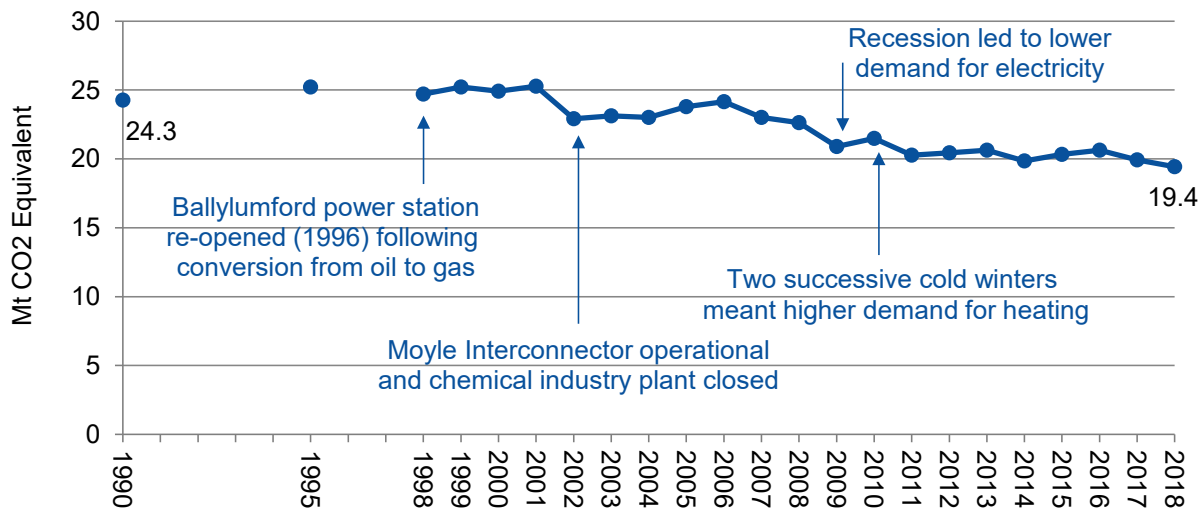
For the 12 month period January 2020 to December 2020, 49.2 per cent of total [electricity consumption in Northern Ireland](#) was generated from renewable sources located in Northern Ireland.

The overall number of [renewable energy applications](#) received in 2019/20 was 88, an increase from 78 in 2018/19 but well below the peak of 820 in 2011/12.

[Data tables](#) and further information for this chapter can be found online.

Greenhouse Gas Emissions

Figure 2.1 Total greenhouse gas emissions in Northern Ireland, 1990 – 2018



Source: Aether and Ricardo Energy & Environment

Note: The base year for UK greenhouse gas emissions is 1990 for carbon dioxide, methane and nitrous oxide, and 1995 for fluorinated gases.

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. The UK Climate Change Act commits the UK to reducing emissions by 100 per cent by 2050 from 1990 baseline levels.

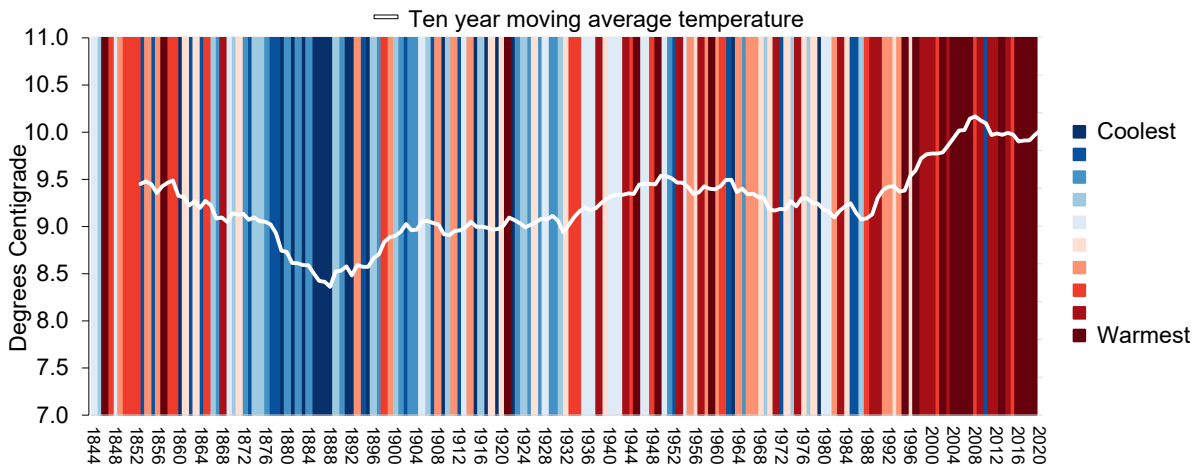
In 2018, Northern Ireland's total greenhouse gas emissions accounted for 4 per cent of the UK total, higher than its population share of 3 per cent. Since the base year (1990), Northern Ireland's total greenhouse gas emissions have decreased by 20 per cent from 24.3 to 19.4 million tonnes of carbon dioxide equivalent (MtCO_{2e}).

The largest sectors in terms of emissions in 2018 were agriculture (27%), transport (23%) and energy supply (15%). Most sectors showed a decreasing trend since the base year. The largest decreases, in terms of tonnes of carbon dioxide equivalent, were in the energy supply, waste management and residential sectors. These were driven by improvements in energy efficiency, fuel switching from coal to natural gas, which became available in the late 1990s, and the introduction of methane capture and oxidation systems in landfill management.

Greenhouse gas emissions is an indicator in the NI Programme for Government (PfG) framework. The criteria used to report change for this indicator is +/- 1.0 percentage points cumulatively on an annual basis against the baseline year value in 2014, when Northern Ireland's greenhouse gas emissions were estimated to be 19.8 MtCO_{2e}. In 2018, Northern Ireland's greenhouse gas emissions were estimated to be 19.4 MtCO_{2e} which is a decrease of 2.1% since the baseline year (2014) and considered as no change for PfG reporting.

Mean Annual Temperature

Figure 2.2 Mean annual temperature, 1844 – 2020



Source: Armagh Observatory

The mean annual temperature for Northern Ireland has been calculated from the Armagh Observatory temperature records.

The ten year moving average trend line shows that the mean annual temperature reached a low towards the end of the 19th century, and has been steadily increasing since.

By the end of the 20th century, the ten-year moving average temperature had risen to its highest levels since the temperature records began.

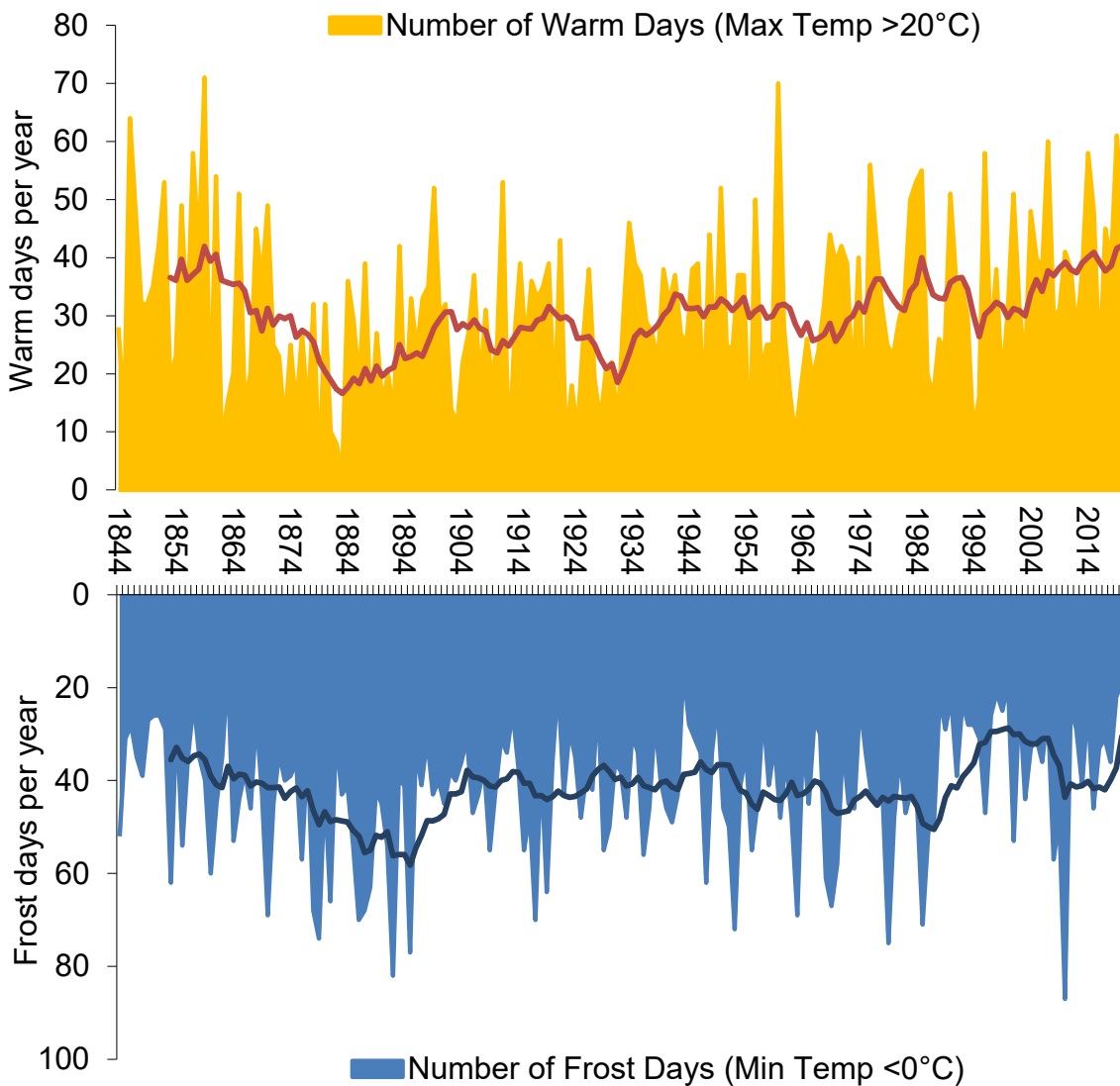
The lowest mean annual temperature (7.35°C) was recorded in 1879.

The highest mean annual temperature (10.64°C) was recorded in 2017.

The 2020 mean annual temperature (10.24°C) was 0.08°C lower than the 10.32°C recorded in 2019.

Warm and Frost Days per Year

Figure 2.3 Number of warm and frost days per year, 1844 – 2020



Source: Armagh Observatory

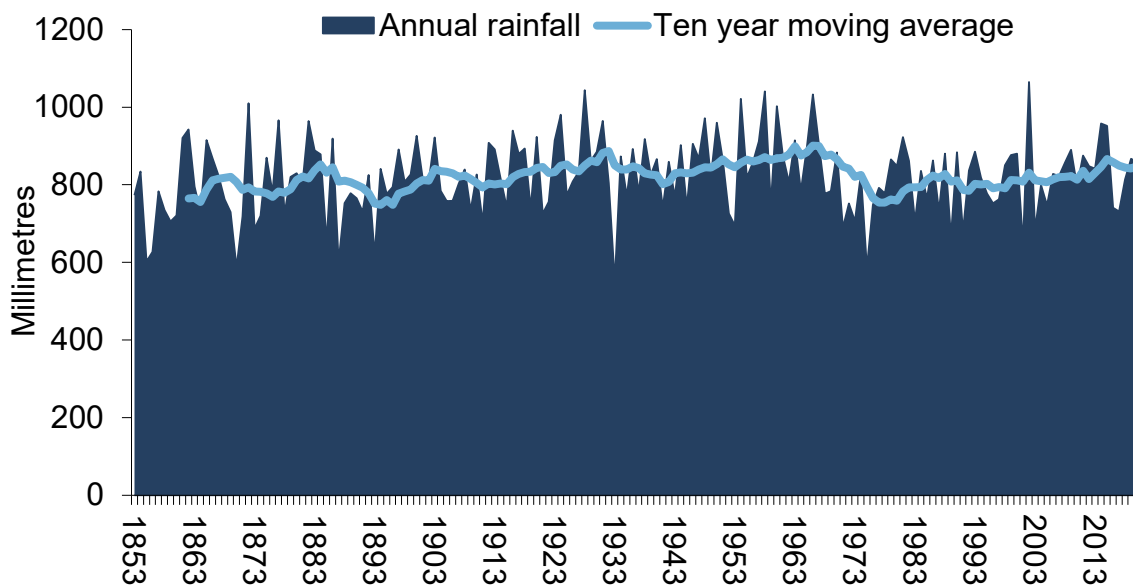
The number of days per year where temperatures were recorded exceeding 20°C or falling below 0°C has been calculated from the Armagh Observatory temperature records.

The ten year moving average trend line shows that the number of warm days per year reached a low towards the end of the 19th century, and has been steadily increasing since. The number of frost days per year reached a high at the end of the 19th century.

The lowest number of recorded frost days per year was 16 days, in 1863 and 1943, whilst the highest number of warm days was recorded in 1859 at 71 days.

Annual Rainfall

Figure 2.4 Annual rainfall, 1853 – 2020



Source: *Armagh Observatory*

The amount of annual rainfall from 1853 to 2020 has been calculated from the Armagh Observatory temperature records.

Since 1853 the ten year moving average has remained between 748 millimetres and 901 millimetres of rain per year.

2002 saw the highest level (1,065 millimetres) of annual rainfall over the time series, whilst the lowest level of annual rainfall was recorded in 1933 at 550 millimetres.

3 Air

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 which may adversely impact upon our health and natural environment. This chapter will report on the quality of our air.

There are 18 air quality monitoring stations in Northern Ireland. Levels of carbon monoxide, nitrogen oxides, sulphur dioxide, particles, ozone, benzene and polycyclic aromatic hydrocarbons are monitored at many of these stations and are measured against UK Air Quality Strategy objectives and EU Air Quality Directives.

Weather conditions can be a contributing factor to some periods of poor air quality and subsequent elevated levels of air pollutants. 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 levels of pollutants, especially particulate matter, at ground level.

Key points in this chapter:

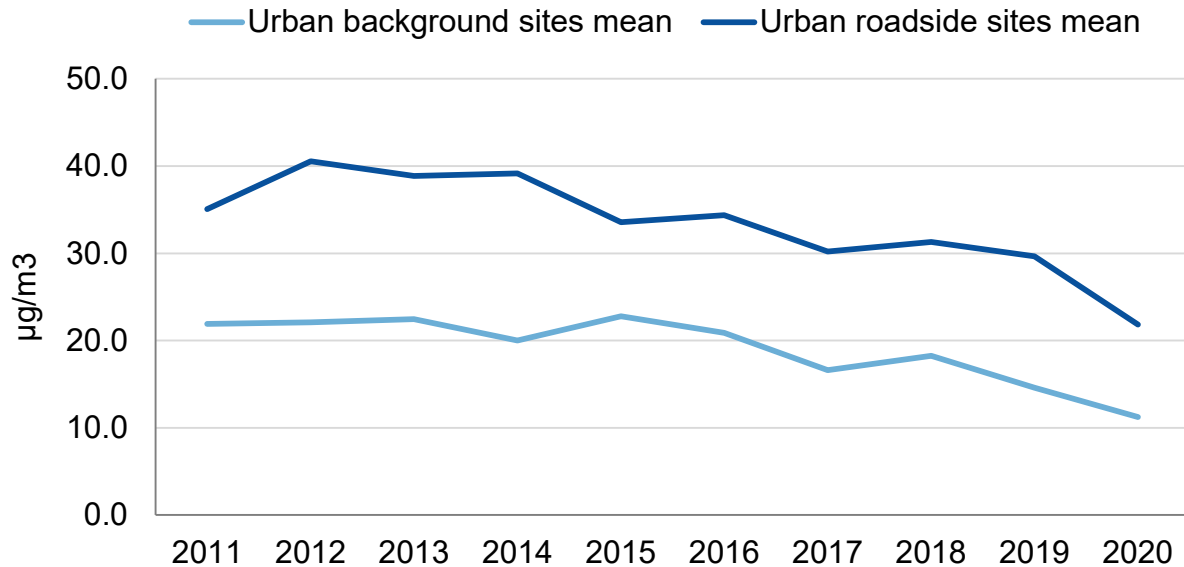
- In 2020, the mean nitrogen dioxide level for the ten sites used for PfG reporting was $24.3\mu\text{g}/\text{m}^3$. This was $11.3\mu\text{g}/\text{m}^3$ less than the level reported in 2014, a positive change from the baseline year.
- In 2020 there was no breach of the UK Strategy Objective or EU Limit Values of $40\mu\text{g}/\text{m}^3$ for the annual mean concentration of particle matter (PM_{10}). The annual mean concentration of PM_{10} across urban areas was $15\mu\text{g}/\text{m}^3$ and the mean for the Lough Navar rural background monitoring site was $7\mu\text{g}/\text{m}^3$.
- In 2019, of the ammonia emissions from agriculture, 88 per cent came from livestock, 8 per cent came from the application of fertilisers containing nitrogen and 4% from the application of other organic materials to land (sewage sludge and digestate).

A comprehensive summary of [air pollution in Northern Ireland](#) is available from DAERA.

[Data tables](#) and further information for this chapter can be found online.

Nitrogen Dioxide

Figure 3.1a Annual mean concentration of nitrogen dioxide (NO₂), 2011 – 2020



Source: DAERA

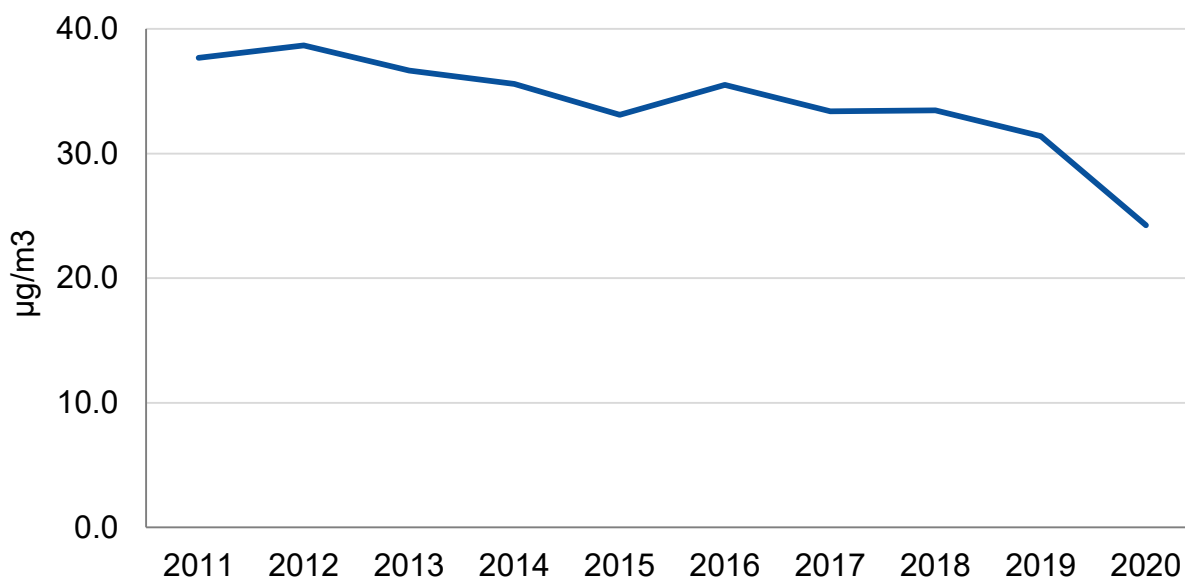
Nitrogen dioxide (NO₂) is part of a group of gaseous air pollutants produced as a result of domestic and industrial combustion, road transport, other forms of transport and energy generation. NO₂ can exacerbate symptoms of heart and lung conditions, thereby reducing quality of life for affected individuals. NO₂ can also adversely affect plant life and biodiversity in sensitive habitats.

In 2020, nitrogen dioxide was monitored using automatic techniques at 16 sites across Northern Ireland. The UK Air Quality Strategy sets objectives for an hourly mean limit of 200µg/m³ and no more than 18 exceedances of this hourly limit are allowed per year. In addition, there is an annual mean limit of 40µg/m³. These objectives are the same as those set out in the EU Air Quality Directive 2008/50/EC.

Figures for 2020 are provisional as the final data ratification was not completed before these statistics were produced, see ESR [user guidance](#) document for further details of validation and ratification process. The average annual mean concentration of NO₂ across Northern Ireland's urban background sites remained relatively stable between 2011 and 2016, varying between 20 and 23µg/m³. Since 2017 the average annual mean concentration of NO₂ has fallen below this level, and was 11.2µg/m³ across Northern Ireland's urban background sites in 2020.

Roadside nitrogen dioxide levels have decreased from 40.6µg/m³ in 2012 to 21.8µg/m³ in 2020.

Figure 3.1b Annual mean concentration of nitrogen dioxide (NO₂), 2011 – 2020, 10 sites - Programme for Government indicator



Source: DAERA

This is an indicator in the Programme for Government (PfG) framework. The ten sites included to produce the average statistic shown above are:

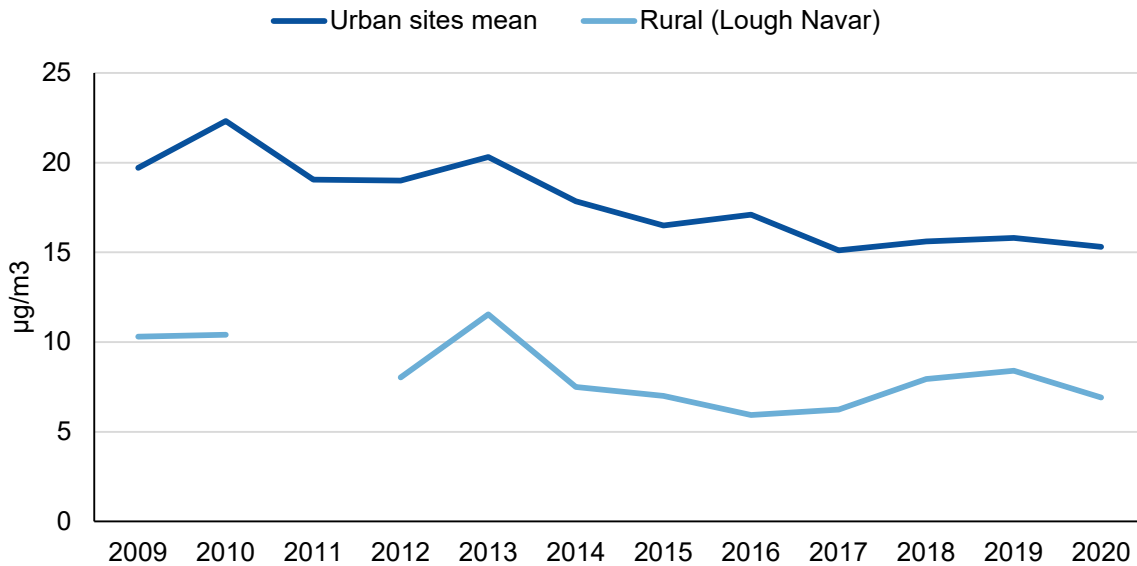
- Armagh Lonsdale Road,
- Belfast Newtownards Road,
- Belfast Ormeau Road,
- Belfast Stockman's Lane,
- Belfast Westlink Roden Street,
- Castlereagh Dundonald,
- Derry Dale's Corner,
- Downpatrick Roadside,
- Newtownabbey Antrim Road,
- North Down Holywood A2.

The criteria used to report change for this indicator is +/- 1µg/m³ against the baseline year value in 2014, when the mean nitrogen dioxide level for these ten sites was 35.6µg/m³.

In 2020, the mean nitrogen dioxide level for the ten sites used for PfG reporting was 24.3µg/m³. This was 11.3µg/m³ less than the level reported in 2014 (figures are subject to rounding). Therefore, the nitrogen dioxide indicator in 2020 is considered to be a positive change from the baseline year.

Particulate Matter

Figure 3.2 Annual mean concentration of particulate matter (PM₁₀), 2009 – 2020



Source: DAERA

Note: There is no value for Lough Navar for 2011 due to low data capture.

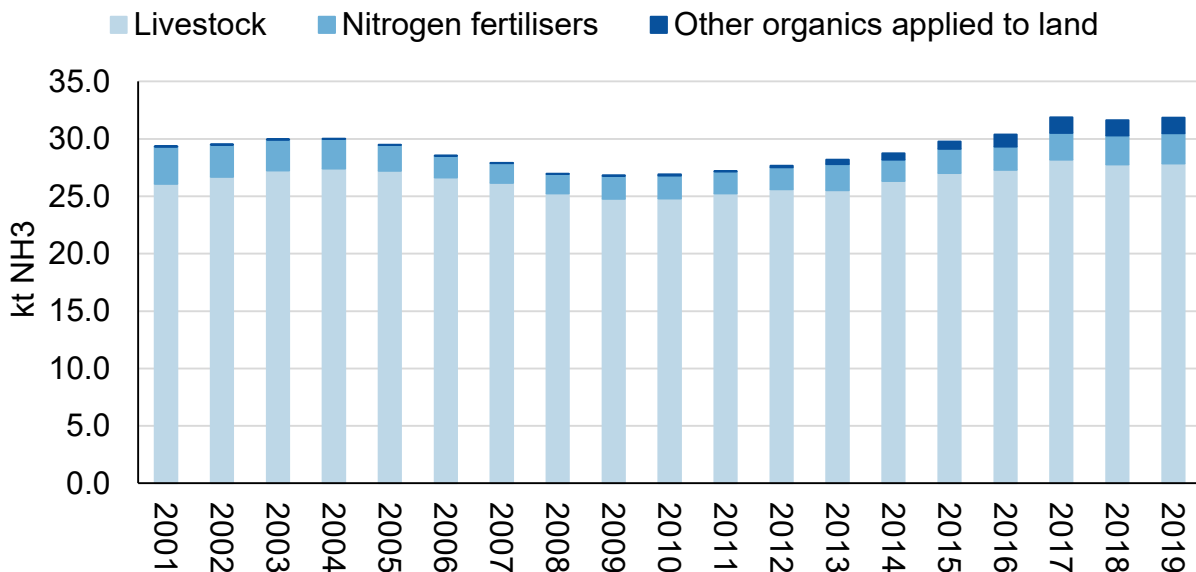
Particulate matter in the atmosphere with a diameter of less than or equal to 10 microns (PM₁₀) arises from both man-made and natural sources. Road transport and fossil fuel combustion produce the majority of airborne particulate matter found in the air in urban locations. Fine particles can be carried deep into the lungs where they can cause inflammation and a worsening of symptoms in people with heart and lung diseases. In addition, they may carry surface-absorbed carcinogenic compounds into the lungs.

The UK Air Quality Strategy sets objectives for an annual mean objective of 40 µg/m³ for PM₁₀. It also sets a daily mean limit (24-hour mean) of 50 µg/m³ which is not to be exceeded more than 35 times a year. These objectives are the same as those set out in the EU Ambient Air Quality Directive.

Figures for 2020 are provisional as the final data ratification was not completed before these statistics were produced, see ESR [user guidance](#) document for further details of validation and ratification process. In 2020, at all 11 sites where PM₁₀ is monitored, there was no breach of the UK Strategy Objective or EU Limit Values of 40 µg/m³ for the annual mean concentration of this pollutant. The annual mean concentration of PM₁₀ across urban areas in Northern Ireland in 2020 was 15 µg/m³ and the annual mean for the Lough Navar rural background monitoring site was 7 µg/m³. In the period since 2009, the annual mean concentration of PM₁₀ at the rural Lough Navar site has been no higher than 12 µg/m³ while the annual mean concentration across Northern Ireland's urban monitoring sites has reached a maximum of 22 µg/m³ (in 2010) but remained steady at lower levels in recent years.

Ammonia

Figure 3.3 Annual ammonia emissions from agriculture, 2001 – 2019



Source: Rothamsted Research, North Wyke

Note: Provisional data. Finalised information published in NAEI Air Quality Pollutant Inventory in October 2021.

Ammonia is an air pollutant which arises mainly from agricultural practices. The agriculture sector accounted for the majority of ammonia emissions in Northern Ireland in 2019. Other sources include transport, commercial and domestic combustion and industrial processes.

In 2019, of the ammonia emissions from agriculture, 88% came from livestock, 8% from the application of fertilisers containing nitrogen and 4% from the application of other organic materials to land (sewage sludge and digestate). Estimates of total ammonia emissions from agriculture are based on numbers of cattle, sheep, pigs, poultry, horses, goats and deer together with associated information on livestock and manure management practices and the use of nitrogen-containing fertilisers.

Emissions from livestock have increased by 6.9% since 2001 (from 26.1kt to 27.9kt in 2019). This compares with a 13.7% decrease for the UK as a whole over the same period. Cattle numbers have declined to a lesser extent in NI compared with the UK as a whole. Dairy cow numbers have also increased in NI. Pig and poultry numbers have increased over this period in NI in contrast to decreasing or stable populations for the UK as a whole.

The ammonia emissions from nitrogen fertilisers have declined by 0.6 kilotonnes (from 3.3kt in 2001 to 2.6kt in 2017), an 18.9% decrease. This is directly associated with a significant reduction in fertiliser use, particularly on grassland. Overall, ammonia emissions have increased, by 8.5%, from 29.3kt in 2001 to 31.8kt in 2019.

4 Water and Marine

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.

The majority of Northern Ireland's 650 km 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 harbour seals, whales, dolphins, seabirds, waterfowl and other species that migrate here.

This chapter looks at the quality of Northern Ireland's inland and coastal waters, including levels of compliance with waste water standards, pollution incidents and Irish Sea temperatures.

Key points in this chapter:

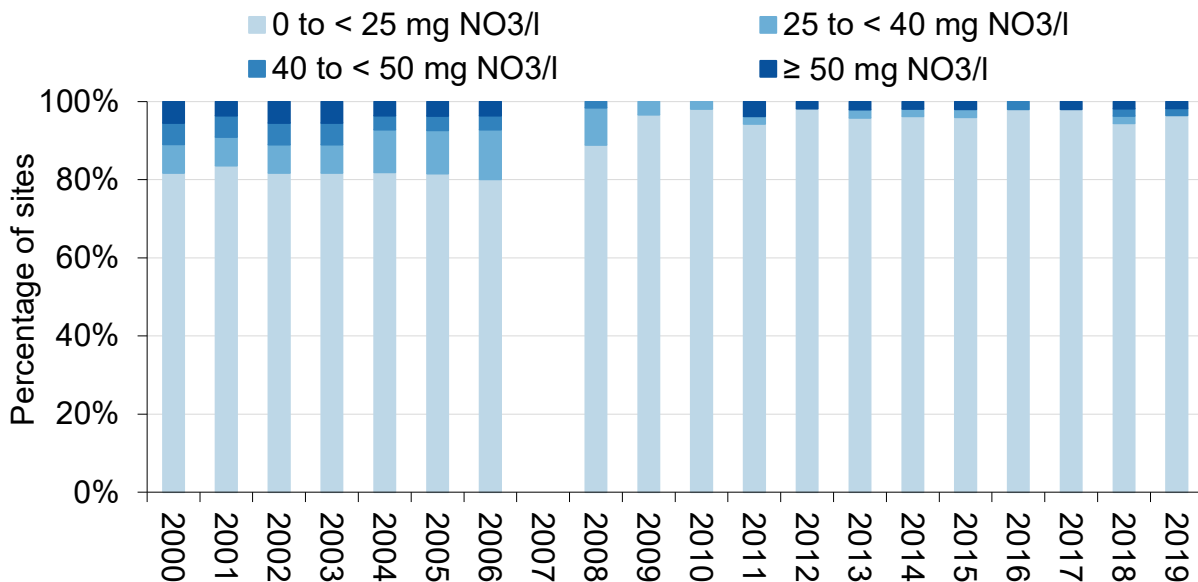
- In 2020 soluble reactive phosphorus (SRP) was measured at 93 surveillance rivers across Northern Ireland giving an average concentration of 0.067 mg/l of phosphorus per litre of water. This was 0.008 mg/l more than the baseline level reported in 2015 and is considered as no change for PfG reporting.
- Levels of winter DIN have been monitored consistently at 24 marine waterbodies in Northern Ireland since 2012. In 2020, winter DIN was recorded at 26.2 µM. This is considered to be no change when compared to the 2015 baseline level for PfG reporting.
- Water pollution incidents are investigated by Northern Ireland Environment Agency (NIEA). In 2019 there were 1,754 incidents reported to NIEA or discovered by NIEA during inspections, of which 941 (53.6 per cent) were substantiated (confirmed) as having an impact on the water quality of the receiving waterway. Of these, 17 per cent were considered to be of High or Medium Severity.
- Three out of nine designated shellfish water protected areas (SWPAs) complied with the Water Framework Directive guideline E. Coli standard in Shellfish Flesh in 2020.

Statistics related to [drinking water](#) quality, [bathing water](#) quality, [blue flag](#) beaches, [marine water](#) quality and [beach litter](#) are available online.

[Data tables](#) and further information for this chapter can be found online.

Groundwater Quality

Figure 4.1 Annual mean nitrate concentrations (in groundwater), 2000 – 2019



Source: NIEA

Note: no figures for 2007 as a major review of the network was undertaken during that period.

The Northern Ireland regional groundwater monitoring of nitrate concentrations was initiated in 2000 and is ongoing (Figure 4.1). The Groundwater Daughter Directive (2006/118/EC) sets the groundwater quality standard at 50 mg NO₃/l. In the period 2000 to 2006, 91 per cent of sites had an annual mean concentration of less than 40 mg NO₃/l, in which 82 per cent of these sites had concentrations of less than 25 mg NO₃/l.

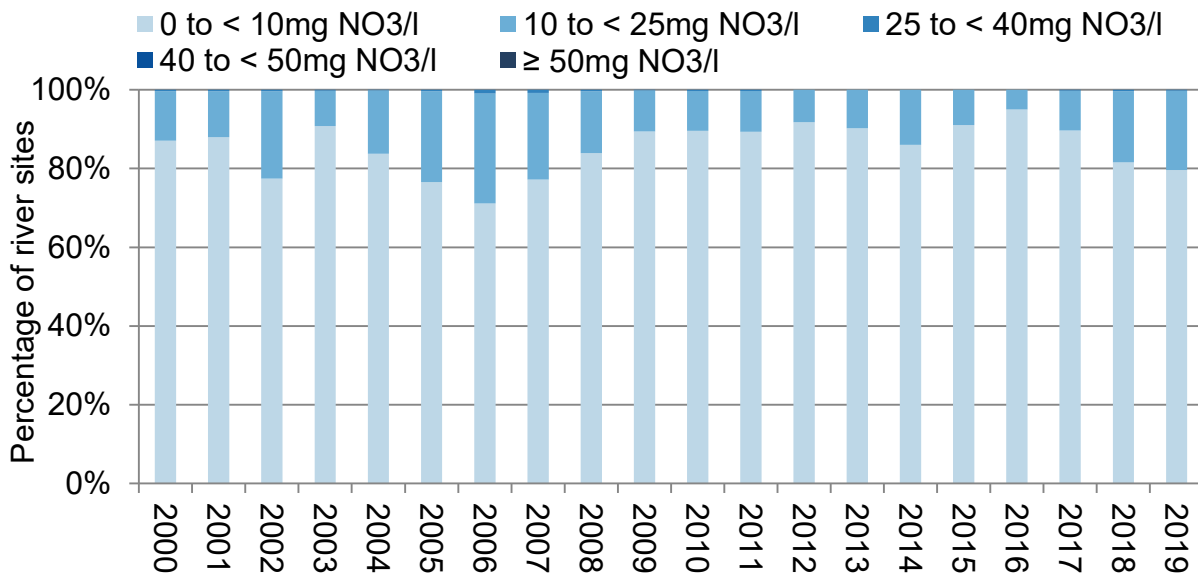
The regional network of monitoring sites was reviewed in 2007/2008. The nitrate groundwater monitoring programme resumed in 2008. The figures both pre and post review are broadly comparable.

In 2019, nitrate concentrations were monitored at 56 groundwater sites across Northern Ireland giving an average concentration of 6.59 mg NO₃/l. At 54 of the 56 groundwater monitoring stations (96 per cent) in 2019, groundwater nitrate concentrations were consistently below 25 mg NO₃/l.

The 2 sites (4 per cent) that are reported above 25 mg NO₃/l in 2019 can be described as the following: One site has consistently been over 50mg NO₃/l for the last 8 years and its 2019 average was 51.08 mg NO₃/l a reduction from 65.6 mg NO₃/l in 2018. The other monitoring site was added to the network in 2018, had an average value of 44.30 mg NO₃/l in 2019, a reduction from an average value of 51.7mg NO₃/l in 2018.

River Quality - nitrate

Figure 4.2 Annual mean nitrate concentrations (in rivers), 2000 – 2019



Source: NIEA

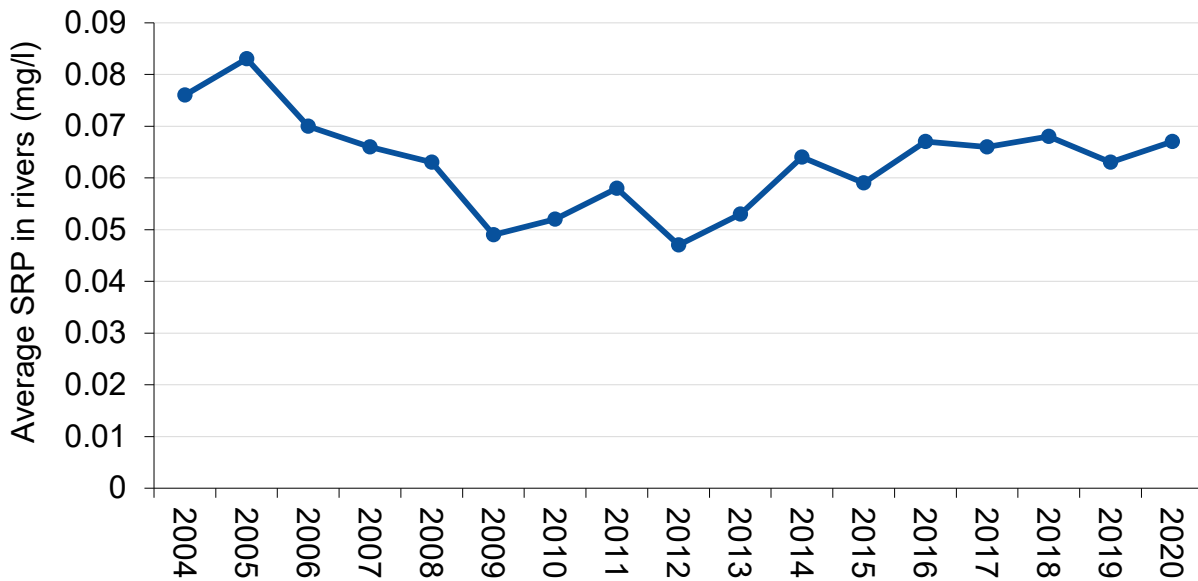
Under the Nitrates Directive, Northern Ireland must monitor surface waters for nitrate pollution against a mandatory standard of 50 mg NO₃/l. In addition, a guide standard for surface waters is operational where 90 per cent of samples should be less than 25 mg NO₃/l.

In the period 2000 to 2011, over 99 per cent of sites had an annual mean concentration of less than 25 mg NO₃/l. In the period 2012 to 2016, all rivers that were monitored for nitrate had an annual mean concentration of less than 25 mg NO₃/l. In 2019, 99.8 per cent of sites had an annual mean concentration of less than 25 mg NO₃/l.

Long-term seasonal trend analysis shows that the monthly trends in average nitrate concentrations in rivers in Northern Ireland are predominantly decreasing or stable over the 28-year period, 1992-2019, which may be attributed to the measures implemented through the Nitrates Action Programme.

River Quality – Soluble Reactive Phosphorus

Figure 4.3 Soluble Reactive Phosphorus (SRP) in rivers, 2004 – 2020



Source: DAERA

Soluble Reactive Phosphorus (SRP) is a plant nutrient, which, when present in rivers in elevated concentrations, can lead to accelerated growth of algae and other plants. The impact on the composition and abundance of plant species can have adverse implications for other aspects of water quality, such as oxygen levels, and for the characteristics of river habitats. These various changes can cause undesirable disturbances to populations of water animals, such as invertebrates and fish.

The introduction of The Phosphorus (Use in Agriculture) Regulations (Northern Ireland) 2006 has contributed to a reduction in phosphorus from agricultural activities, in conjunction with ongoing improvements in domestic wastewater treatment through investment by Northern Ireland Water. From the low of 0.047 mg/l reported in 2012, levels of soluble reactive phosphorus in the 93 Surveillance Rivers have increased to 0.067 mg/l in 2020.

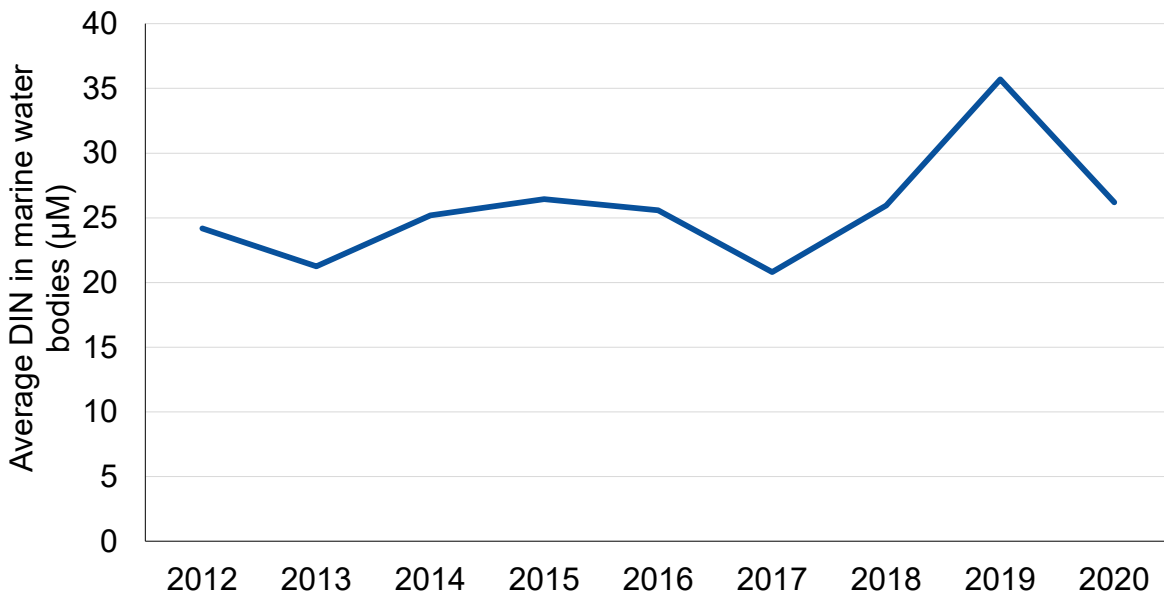
This is an indicator in the Programme for Government (PfG) framework. The criteria used to report change for this indicator is +/- 0.01 mg/l against the baseline year value in 2015, when the SRP concentration was 0.059 mg/l.

In 2020 SRP was measured at 93 surveillance rivers across Northern Ireland giving an average concentration of 0.067 mg/l of phosphorus in river water. This was 0.008 mg/l more than the level reported in 2015. Using the criteria specified above there is considered to be no change since the baseline year for PfG reporting.

Note: Due to restrictions imposed as a result of the Covid-19 pandemic, river monitoring was affected with samples not taken in April and May and limited numbers taken in March and December of 2020.

Winter Dissolved Inorganic Nitrogen

Figure 4.4 Winter Dissolved Inorganic Nitrogen (Winter DIN), 2012 - 2020



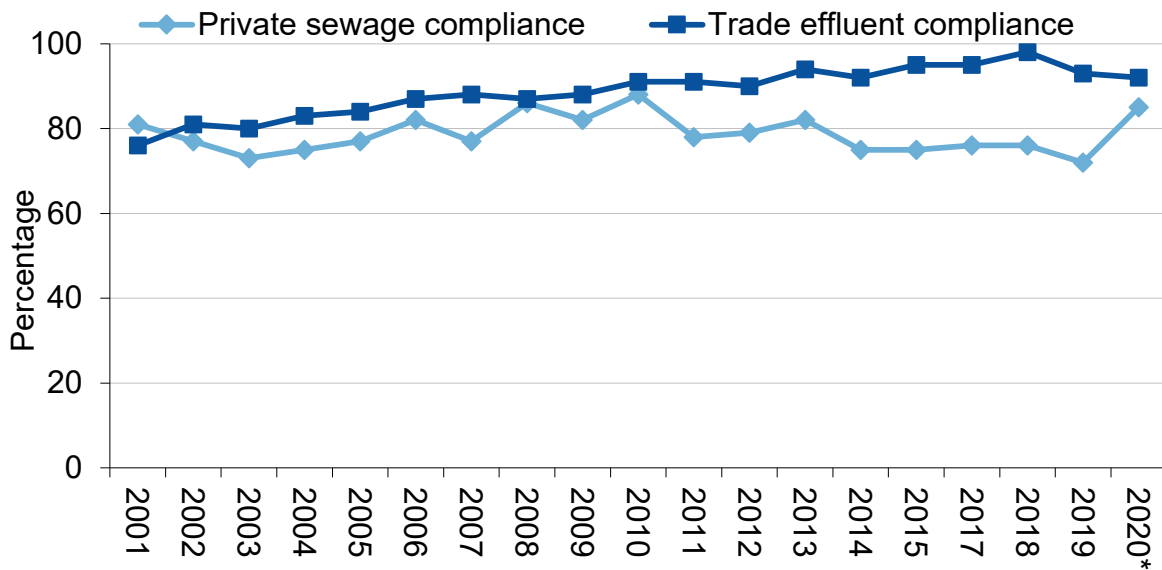
Source: DAERA

Marine nutrients are one of the key environmental variables controlling the growth of phytoplankton in coastal waters. In temperate regions, coastal waters nutrient concentrations are highest in winter, when agricultural run-off is highest due to increased rainfall, and algal growth is lowest due to lack of light and lower temperatures. Monitoring studies performed in the UK, indicate that concentrations of nutrients tend to peak in coastal waters during the winter months (November to February). Dissolved inorganic nitrogen (DIN), which consists of nitrate, nitrite and ammonia is an important indicator of marine nutrient status, as nitrogen is the most important nutrient in limiting marine algal growth. Excessive levels of marine nutrients can lead to local imbalances of marine phytoplankton (planktonic blooms) and macroalgae (seaweeds) a process known as eutrophication. Local effects can include impacts on the dissolved oxygen concentrations of the water column which can lead to fish kills and the localised smothering of other marine macroalgae and animals, particularly in intertidal areas.

This is an indicator in the Programme for Government (PfG) framework. The criteria used to report change for this indicator is +/- 3 µM against the baseline year value in 2015, when the level of winter DIN was 26.45 µM. In NI levels of winter DIN have been monitored consistently at 24 marine waterbodies since 2012. The levels of winter DIN remained relatively stable between 2012 and 2018 with a sharp rise in levels recorded in 2019. In 2020 the mean winter DIN value fell to 26.2 µM, which is considered to be no change since the baseline year for PfG reporting. The indicators for both Soluble Reactive Phosphorus (SRP) in rivers and Winter Dissolved Inorganic Nitrogen (DIN) in marine waters are combined to form PfG indicator 44. Combining the component indicators, population indicator 44 levels of soluble reactive phosphorus in our rivers and levels of Dissolved Inorganic Nitrogen in our marine waters are designated as no change.

Industrial Discharge Quality

Figure 4.5 Trends in annual private and trade discharge consent compliance, 2001 – 2020*



Source: NIEA

* Caution should be used when comparing 2020 data with previous years due to a lower sampling rate.

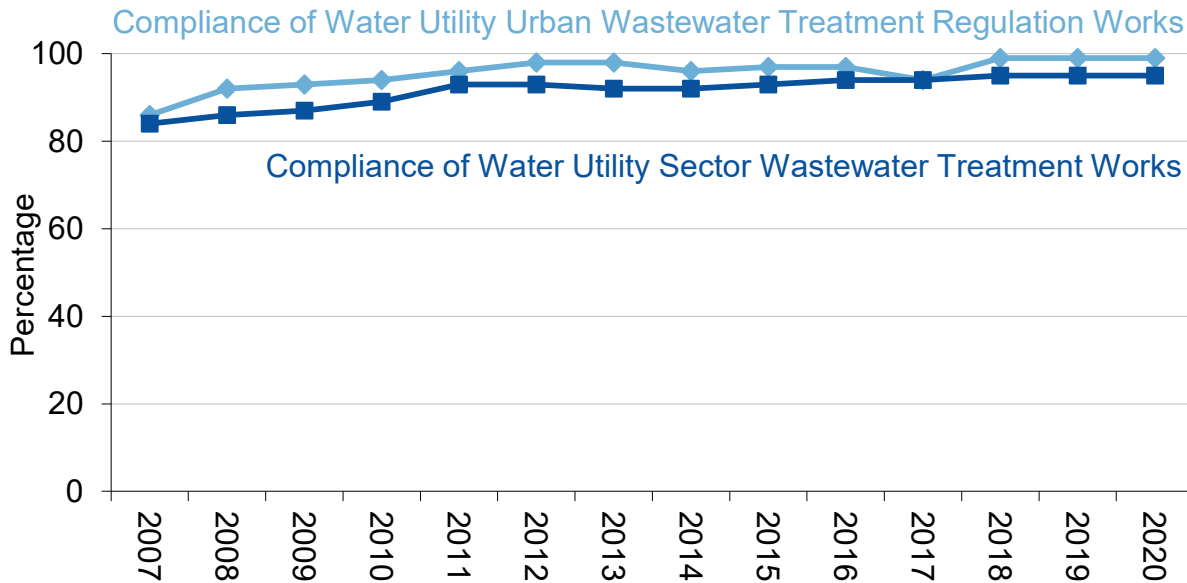
The monitoring of effluent discharges gives an indication of levels of pollution to the water environment and improvements in controls.

Due to travel restrictions and other constraints as a result of the COVID-19 Pandemic, the compliance sampling programme was significantly reduced for the 2020 calendar year, with less than 40 per cent of the 2019 number of sample stations being scheduled. The compliance figures reported are therefore based on a much smaller number of sites than were reported previously and these figures reflect a pass/fail assessment of compliance, based on a single sample result.

Overall compliance with consent standards for Private Sewage and Trade consents is reported as improved on last year's figures, but restrictions on sample location and types mean this data is not likely to be a full picture at this time. In the absence of formal compliance testing during the pandemic, surveillance and visual inspections have been used to help monitor sites and to respond to any reports of pollution.

Water Utility Discharge Quality

Figure 4.6 Summary of compliance of Water Utility Waste Water Treatment Works (WWTW), 2007 – 2020



Source: NIEA

Compliance of WwTW with the Standards in Water Order Consents (WOC)

Compliance of waste water treatment works (WWTW) with numeric conditions of Water Order consents was introduced in 2007. It is a key performance indicator for the water utility sector and has continued to improve since 2007 with compliance now at 95 per cent.

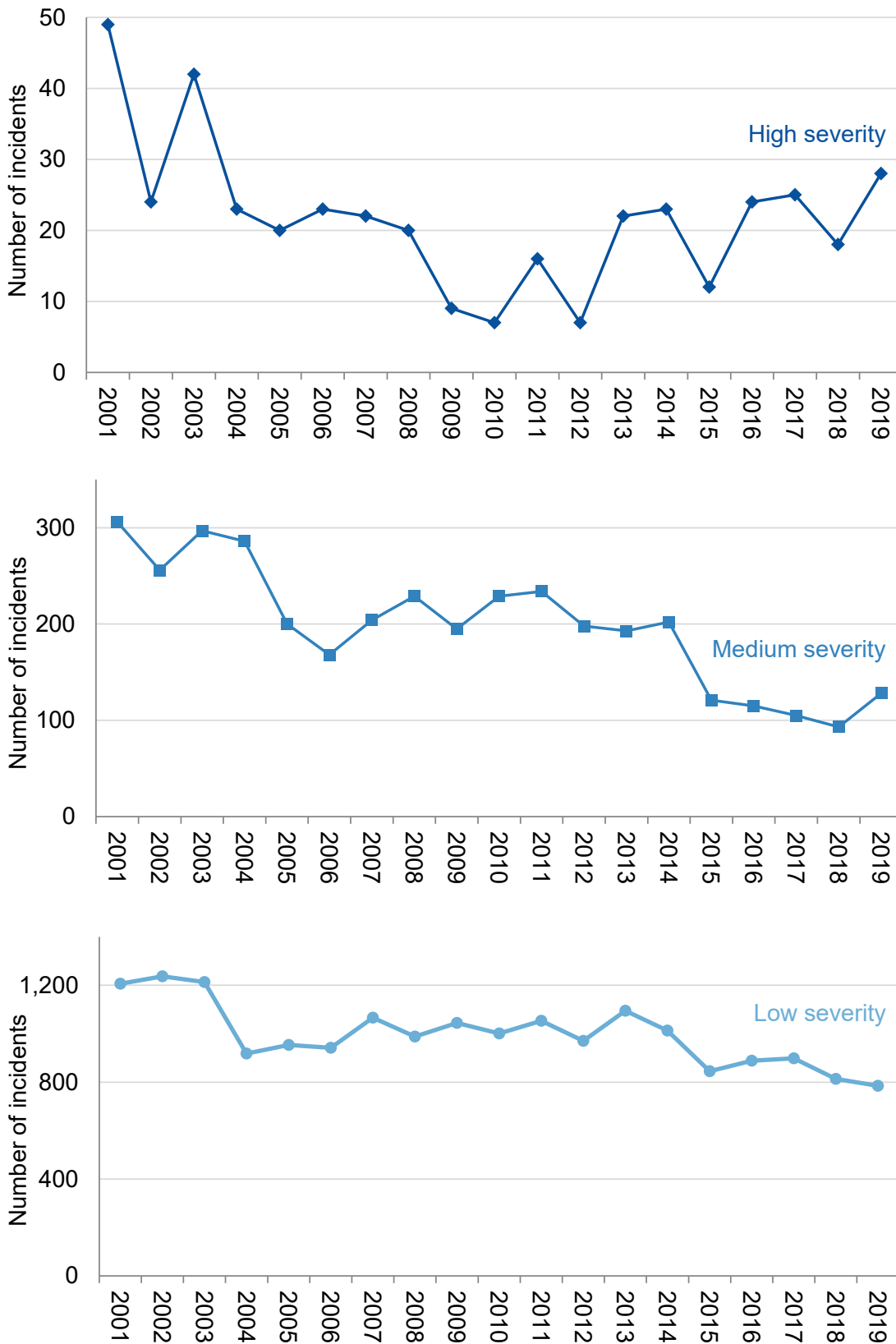
Northern Ireland Water (NIW) compliance is assessed against numeric standards set for discharges serving a population equivalent greater than 249. The number of WWTW has dropped from 244 in 2007, to 235 in 2020. Numeric compliance is also assessed for six waste water treatment works operated under Public Private Partnership (PPP) contracts which continued to achieve 100 per cent compliance. Of the 235 WWTW assessed, 224 complied with the numeric conditions of their Water Order Consents.

Compliance of WwTW with the Urban Waste Water Treatment Regulations

Numeric compliance is assessed against the requirements of the Urban Waste Water Treatment (UWWT) Regulations (Northern Ireland) 2007 for 78 WWTW under the Regulations in 2020. Compliance has improved since 2007 and reached 99 per cent in 2020. There was one non-compliant WWTW in 2020.

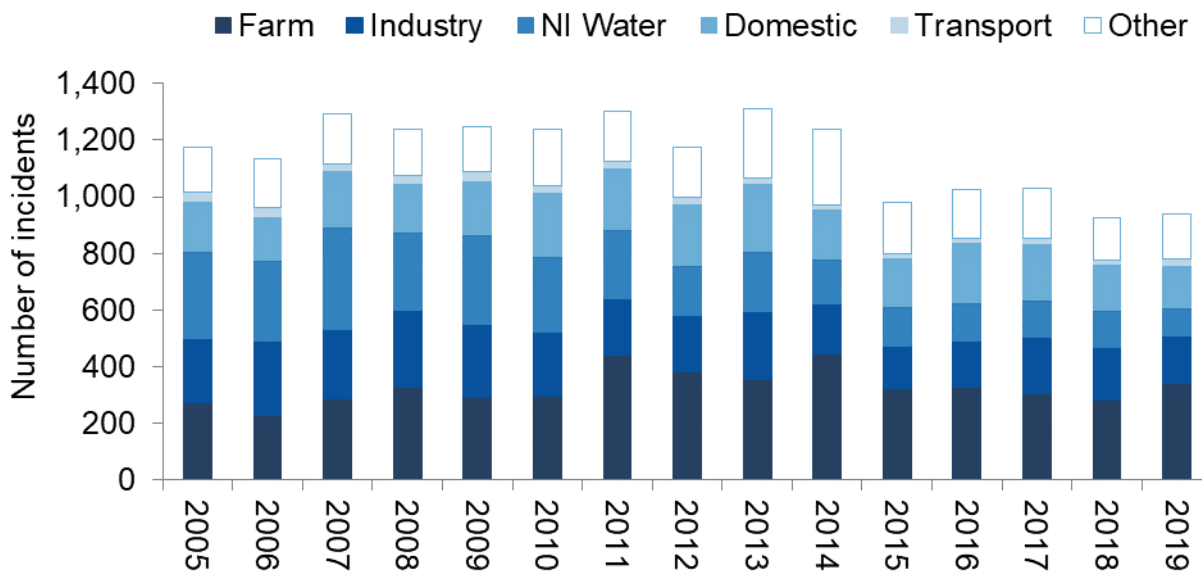
Water Pollution Incidents

Figure 4.7a Severity of substantiated water pollution incidents, 2001 – 2019



Source: NIEA

Figure 4.7b Source of Substantiated Water Pollution Incidents, 2005 – 2019



Source: NIEA

In 2019, there were 1,754 incidents either reported to NIEA or discovered by NIEA staff during inspections or proactive work, of which 941 (53.6 per cent) were substantiated (confirmed) as having an impact on the water quality of the receiving waterway.

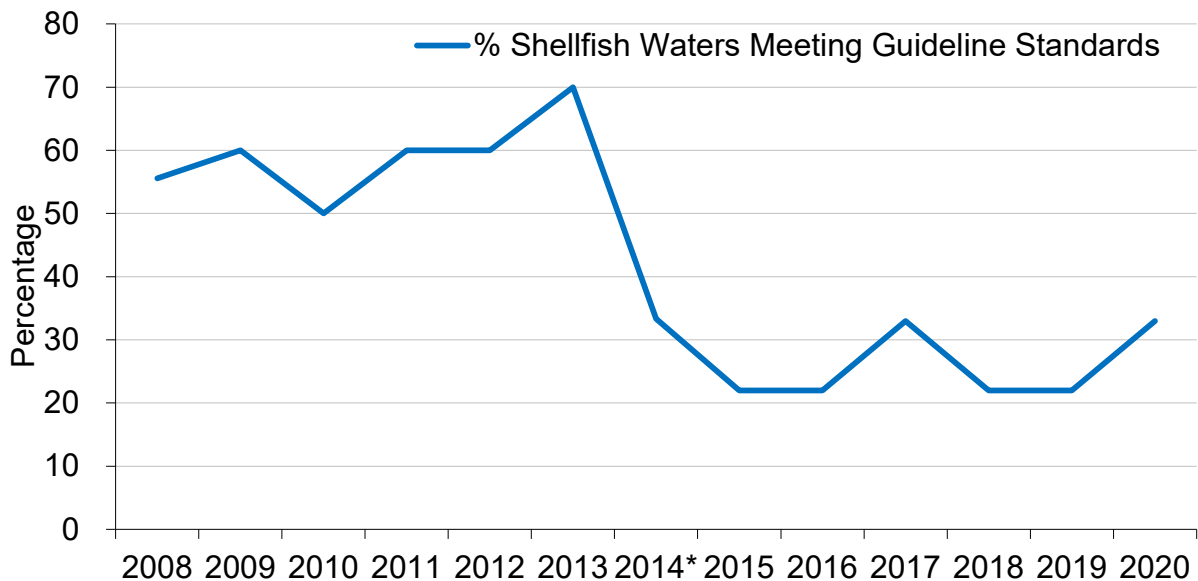
The total number of reported and discovered incidents decreased by 2 per cent compared with last reported year (1793) and the number of substantiated incidents in 2019 (941) increased by 1.8 per cent compared to 2018 (924). The total number of substantiated incidents in 2019 was 39 per cent lower than the average annual level recorded in the period 2001 – 2003 (1,543).

Substantiated pollution incidents are classified according to their environmental impact severity. A total of 156 (17 per cent) high and medium severity incidents were investigated during 2019. This was an increase of 41 per cent compared with 2018 figures (111).

In 2019, Farming (36.5 per cent), accounted for the largest proportion of substantiated incidents investigated by NIEA, followed by Industry (17.4 per cent), Other (17.1 per cent), Domestic (16.0 per cent), Northern Ireland Water Ltd (10.7 per cent) and Transport (2.3 per cent).

Shellfish Water Protected Areas

Figure 4.8 Shellfish waters directive compliance, 2008 - 2020



Source: DAERA Marine and Fisheries Division

Note: From 2008-2013, compliance was measured against guideline *E. Coli* standard in flesh as set out in the Shellfish Waters Directive.

*In January 2014, the Shellfish Waters Directive was subsumed into the Water Framework Directive (WFD). The WFD Guideline standard is slightly tighter than the existing standard in the Shellfish Waters Directive.

Designated Shellfish Water Protected Areas (SWPAs) are areas designated for the protection of shellfish growth and production. Good water quality is important for the production of high quality shellfish. In Northern Ireland there are currently ten Shellfish Water Protected Areas which were designated under the Shellfish Waters Directive and are currently managed under the Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017. These SWPAs are located within Lough Foyle (Longfield Bank and Balls Point), Larne Lough, Belfast Lough, Strangford Lough (Skate Rock, Reagh Bay/ Paddy's Point and Marlfield Bay), Killough Harbour, Dundrum Bay and Carlingford Lough. Further information regarding areas sampled can be found at <https://www.daera-ni.gov.uk/publications/shellfish-action-plans-2019>

In January 2014, the Shellfish Waters Directive was subsumed into the Water Framework Directive, resulting in more stringent *E. coli* standards and a noticeable “drop” in the percentage of designated shellfish waters. In 2020, three out of nine designated shellfish waters (33 per cent) complied with the guideline *E. coli* standard. In 2019 the percentage compliance was 22 per cent with two out of nine designated shellfish waters achieving compliance. No data was available for Marlfield in Strangford Lough which has not seen any shellfish harvesting for a number of years. The Department will consider the de-designation of this site if harvesting is not recommenced.

Comprehensive monitoring programmes are in place to assess the status of Shellfish Water Protected Areas under the Water Environment (Water Framework Directive)

Regulations (Northern Ireland) 2017 and classification under the EU Hygiene Regulations (854/2004). A suite of determinants are assessed to determine ecological status and the overall objective under Water Framework Directive (Table 4.8ii included in the [data tables online](#)).

DAERA Environment Marine and Fisheries Division continue to manage Shellfish Water Protected Areas to ensure that there is no deterioration in water quality; also that steady progress is made towards compliance with guideline standards. Compliance with guideline standards are determined by measuring *E.coli* and other prescribed contaminants in shellfish flesh. Relevant shellfish waters contaminants are monitored under Water Framework Directive Annex VIII and Annex X specific pollutants and priority hazardous substances.

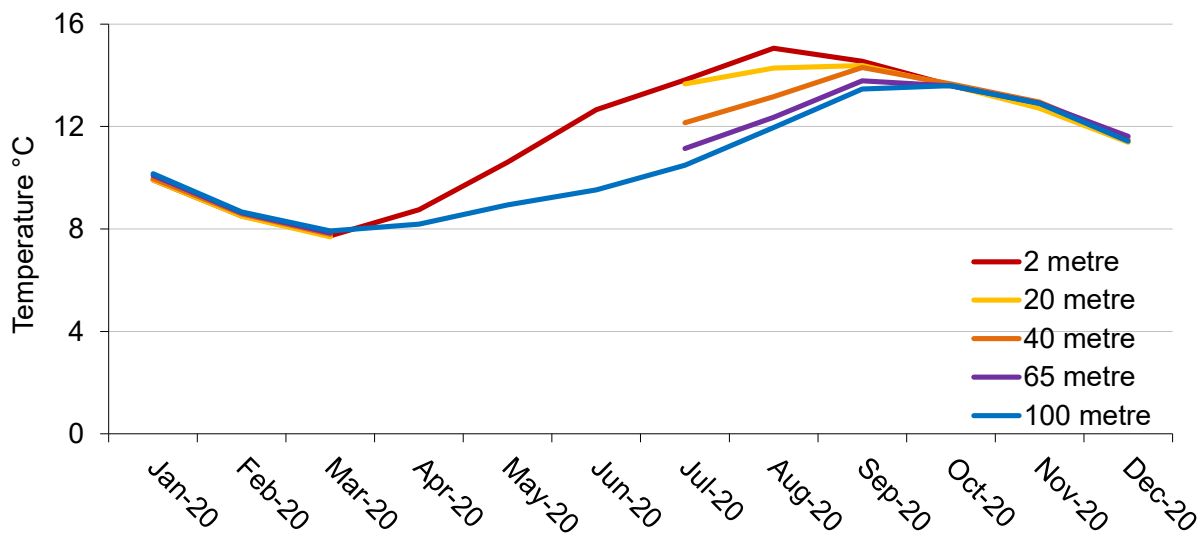
Shellfish beds are classified by the Food Standards Agency in Northern Ireland (FSA in NI) to determine the levels of post-harvest treatment that is required before shellfish can be placed on the market for consumption. Monthly monitoring of shellfish flesh is conducted to ensure that the classification that has been awarded by the FSA in NI remains appropriate. Thus ensuring that levels of marine biotoxins and chemical contaminants within the shellfish flesh do not exceed regulatory limits or cause a risk to public health.

DAERA Environment Marine and Fisheries Division work closely with the FSA in NI in managing shellfisheries from both an environmental and public health perspective.

A full list of shellfish waters and the compliance standard met for each year from 2008 to 2020 is included in the data tables that accompany this report.

Sea Temperature

Figure 4.9 Average monthly sea temperature by depth, Irish Sea, Jan20 – Dec20



Source: AFBI

As part of a long-term research programme investigating how the physical environment affects the Irish Sea's marine ecosystem, the Agri-Food and Biosciences Institute maintain an instrumented mooring in the western Irish Sea measuring temperature, salinity, chlorophyll, and turbidity. This mooring will also soon report data on waves, meteorology and ocean acidification parameters, as the western Irish sea oceanographic climate is expected to change under current climate projections with the potential to affect marine ecosystems and coastal erosion processes.

The temperature of the sea is recorded by thermistors at different depths every three hours and from these measurements daily mean values can be calculated. One is located on the underside of the moored buoy at ~2m seabed, and one close to the anchor at a depth of ~90m. Other thermistors are located along the mooring line at 20, 40 and 65 m. This mooring is just one of a number of permanent coastal monitoring moorings maintained by AFBI.

The lowest water temperature is usually recorded in February and the warmest in August. During the autumn and winter months there is generally little difference in the temperature of water close to the surface and near the seabed. Warming of the surface layers during spring and summer causes the water column to stratify, isolating the bottom water from the surface. Consequently, the bottom water does not warm up as much or mix with the surface water. During the summer the temperature differences between surface and bottom water layers can be as much as 7 or 8 °C, and there are differences in ecologically-significant parameters such as dissolved oxygen and nutrient concentrations. Despite the disruptions caused by the 2020 Coronavirus pandemic, AFBI have continued to maintain data collection for this long-term monitoring programme. This is essential to understand the functioning of the Irish Sea gyre, a regionally important oceanographic feature that controls the ecosystems that support Irish Sea fisheries. The time-series now consists of 25 years of data and a detailed analysis of the data to investigate inter-annual variability in the seasonal development (onset, duration, breakdown) of water column stratification is currently underway.

5 Biodiversity and Land

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 reflects the state of our air, water and land environments. 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 includes statistics on the extent of nature conservation designations in Northern Ireland, the condition of some of these designations, bird populations, soil quality, forest and woodland plantings and the role of agri-environment schemes on our land.

Key points in this chapter:

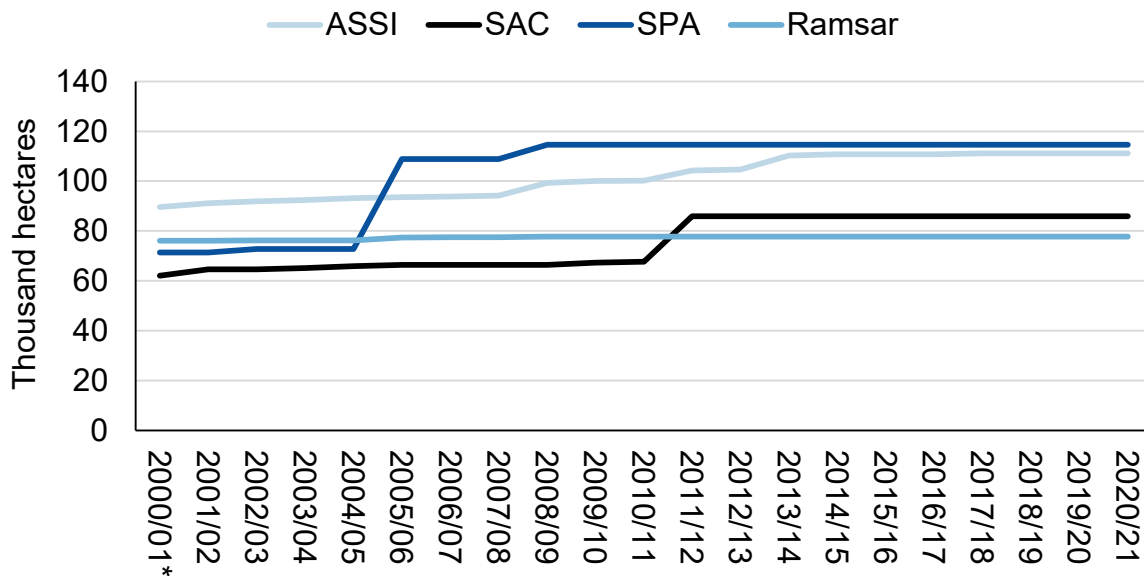
- In 2020/21, the area of terrestrial protected sites under favourable management in Northern Ireland was recorded as 304.04km². This is an increase from the baseline year for PfG reporting (2015/16) and considered a positive change.
- The area of marine protected sites under favourable management in Northern Ireland was recorded as 115.00 square kilometres in 2020/21, an increase from the baseline year for PfG reporting (2015/16) and considered as a positive change.
- Between 1994 and 2019, the estimated total wild bird population has increased by 50 per cent, however it should be noted that not all species populations are increasing. The total wetland bird population is estimated to be similar in 2018/19 to what it was in 1994/95.
- In 2020/21, 283 hectares of new woodland was created by private landowners supported under the Rural Development Programme.
- Agri-environment schemes encourage farmers and landowners to manage their land to benefit the environment. At the end of 2020, 48,000 hectares of land in Northern Ireland were under agri-environment scheme agreement.

The number of [Green Flag Award](#) winning sites in Northern Ireland has grown exponentially in the last 10 years Details are available online.

[Data tables](#) and further information for this chapter can be found online.

Nature Conservation Designations

Figure 5.1(a) Area of nature conservation designations, 2000/01 – 2020/21



Source: NIEA

* These figures include all conservation designations up to and including 2000/01.

Identifying and protecting areas of special nature conservation 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 areas are deemed to be of such importance that they have been formally designated in accordance with a number of pieces of national and international legislation.

Many places throughout Northern Ireland have been designated and protected by these laws to ensure their nature conservation value is retained, and indeed enhanced. Such protection has been afforded to areas on land, to rivers and lakes, to parts of our coastline, and to areas of the surrounding sea.

At 31 March 2021, a total of 111,159 hectares across 394 sites had been declared as Areas of Special Scientific Interest (ASSI), 85,900 hectares across 57 sites as Special Areas of Conservation (SACs), 114,600 hectares across 17 sites as Special Protection Areas (SPAs) and 77,700 hectares across 21 sites as Ramsar sites (areas of wetland and waterfowl conservation). Both SACs and SPAs are designated in accordance with European Directives, and Ramsar sites under an international convention.

There is some overlap between these different types of designation and, therefore, these cannot be totalled to give an absolute figure on the extent of designations. Figures 5.1 (b) and 5.1(c) show the spatial extent and distribution of these areas.

Figure 5.1(b) Areas of Special Scientific Interest (ASSI), designated between 1976 and 2021

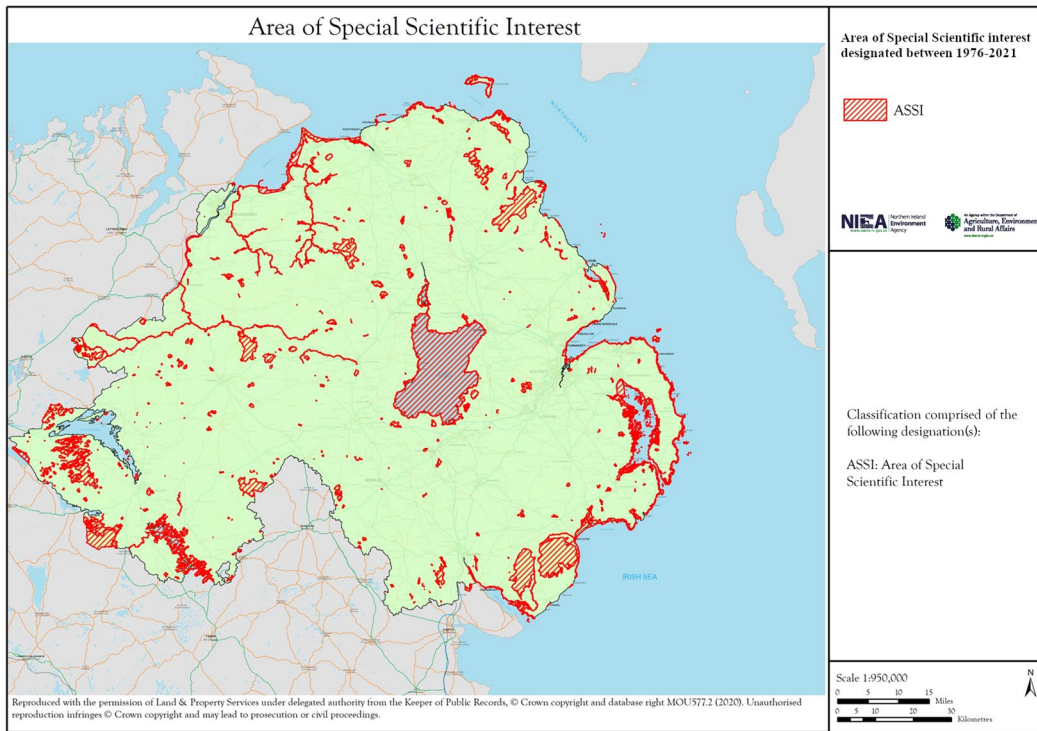
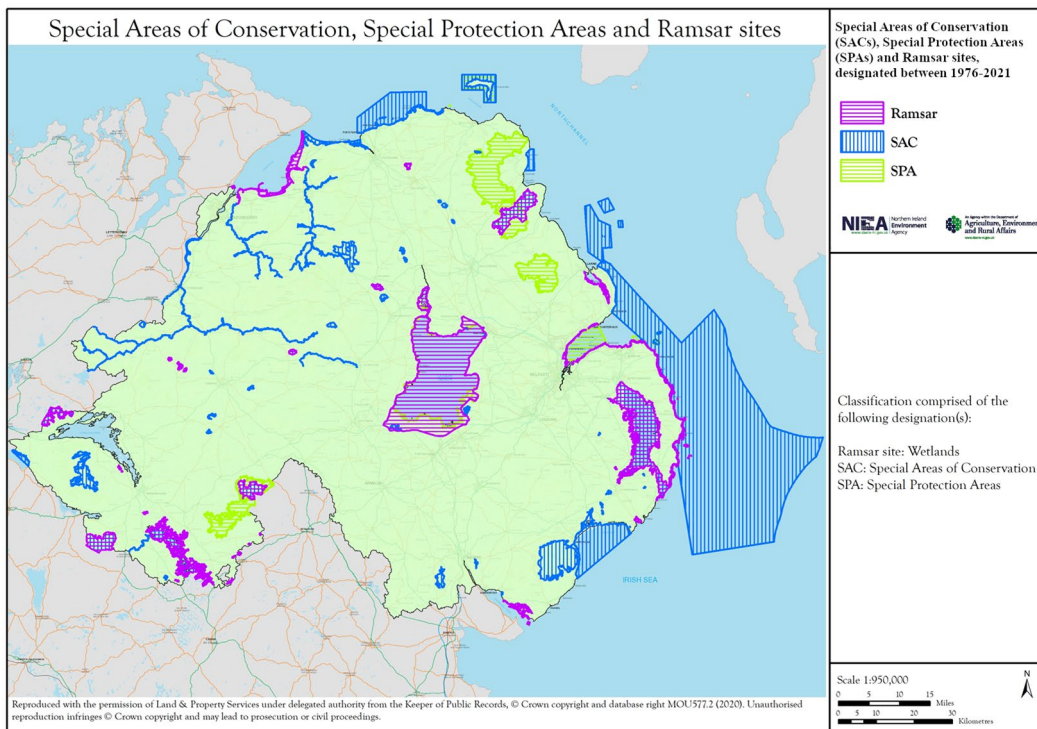
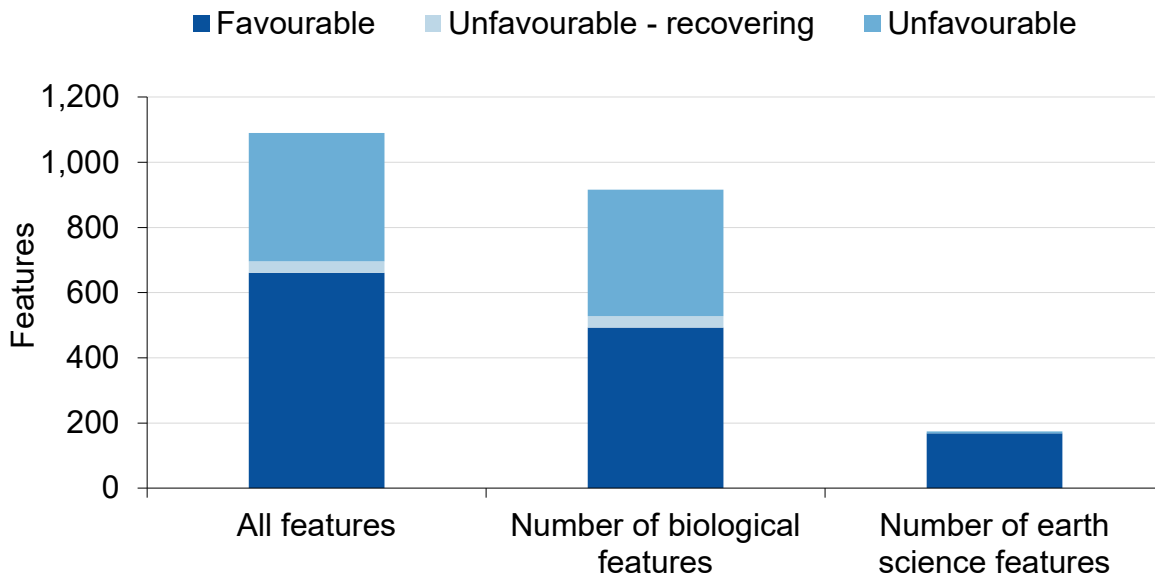


Figure 5.1(c) Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites, designated between 1976 and 2021



Nature Conservation ASSI

Figure 5.2 Condition of features within Areas of Special Scientific Interest (ASSI), for the six year rolling period ending March 2020



Source: NIEA

Note: Due to rounding, percentages may not add to 100 per cent.

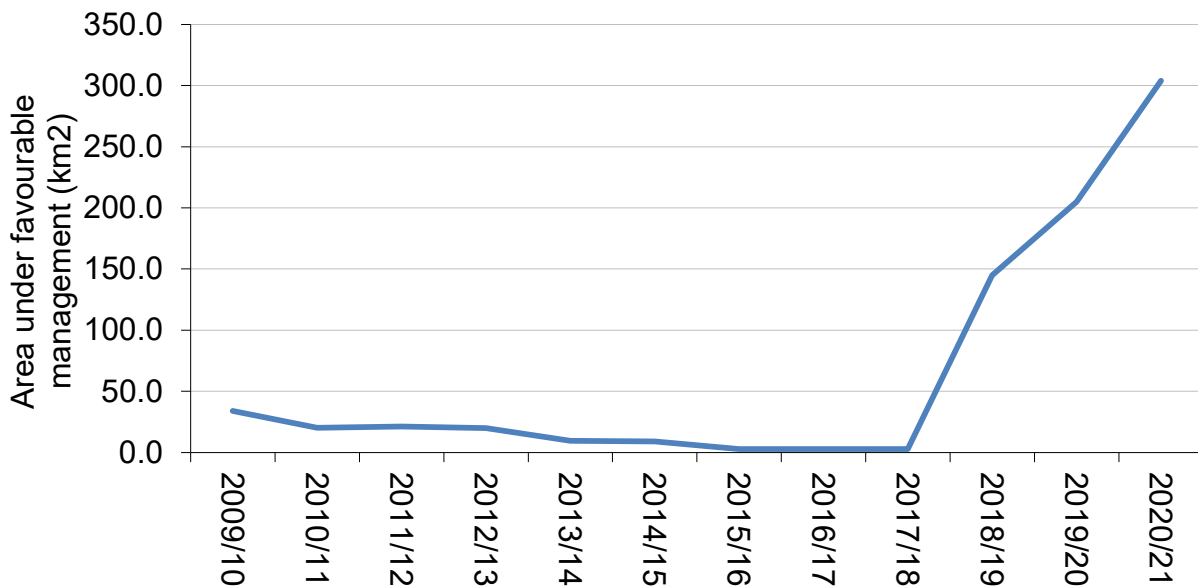
Areas of Special Scientific Interest (ASSIs) are designated sites which are protected under Northern Ireland law for their nature and earth science value. They are selected based on specific qualifying features which include earth science features, habitats and species. The condition of these features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

The first full cycle of monitoring was completed in March 2008, during which 916 features from 195 ASSIs were assessed. These data have been updated with the results from subsequent monitoring over the past 10 years. Over 1,000 features have now been assessed, including features re-assessed as part of the second and third six-year cycles, in addition to a number of new features on recently declared ASSIs. The figures for 2020 are very similar to the 2019 results, with 61 per cent of the features in favourable condition and 36 per cent in unfavourable condition. When this is broken down into biological and earth science features assessed, 54 per cent of biological features were in favourable condition, compared to 97 per cent of earth science features in favourable condition, reflecting the pressures on the natural environment.

NIEA is aiming to achieve favourable condition for a much higher proportion of the ASSI network, but acknowledges that restoring features that are currently unfavourable to favourable condition will take time. The Agency is continuing to work with landowners and other stakeholders to ensure that sympathetic management of ASSIs is in place. A range of delivery mechanisms have been identified to help achieve this objective, including agri-environment schemes, EU Interreg Va Programme, the management of the DAERA estate (Forest Service lands, NIEA country parks and nature reserves) and grant-aid support from DAERA, in addition to direct funding by NIEA through the Management of Sensitive Sites scheme (MOSS).

Terrestrial Protected Sites under Favourable Management

Figure 5.3 Terrestrial protected sites under favourable management 2009/10 to 2020/21



Source: DAERA

Our protected areas represent the very best of our natural landscapes, biodiversity and geodiversity, forming the cornerstone of nature conservation by supporting plants, animals and habitats that are rare or unique. The on-going protection and management of this coherent network of sites ensures that these important natural and cultural assets can be enjoyed by this and future generations.

We have a range of protected area designations, representing features of national and international importance. With the designation of protected sites largely complete, the focus is now on improving the sites overall condition towards “favourable conservation status” (FCS). FCS is being achieved through favourable management interventions which are deemed necessary to support the recovery of the site’s special features, based on a detailed assessment of ecological requirements of a particular site.

A number of initiatives and plans are being put in place to identify what actions are required to achieve FCS and to identify any potential funding mechanisms to assist undertake these actions. Measures to increase the percentage of protected areas under favourable management include:

- Roll out of the Environmental Farming Scheme Higher Level agreements which commenced in early 2018.
- Enhanced roll-out of Management of Sensitive Sites (MOSS) scheme to support favourable management in designated sites.
- Continue to provide support to the two INTERREG Va Habitats projects delivering a series of conservation management plans and conservation actions for a range of cross border sites.

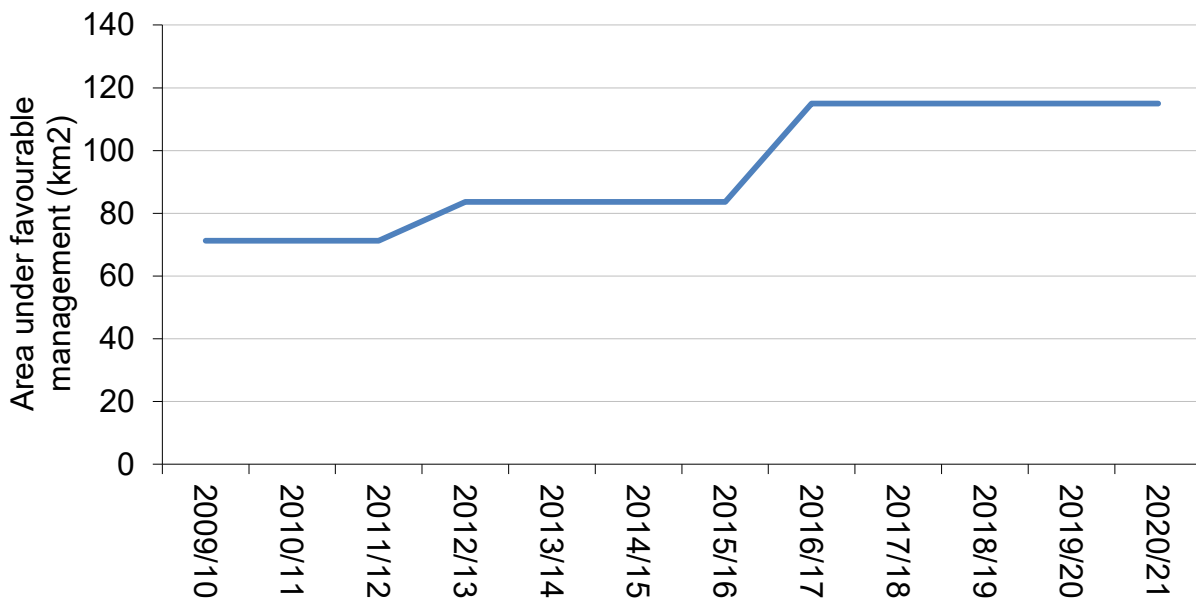
- Working with local authorities to protect priority habitats and species advising on development control and new area plans.
- Developing working examples on the most effective way of measuring natural capital to ensure that the full benefits of natural assets are realised which will ultimately inform elements of CMPs.
- Working with DAERA's grant-aid budget and external EU and Heritage Lottery Fund (HLF) funding to manage designated sites and priority habitats and species.

The area of terrestrial protected sites under favourable management has shown a decreasing trend since 2009/10 until 2017/18. During this period, the Department has been working on designating an ecologically coherent network of terrestrial protected sites. The total terrestrial protected sites increased from 1,384km² in 2009/10 to 1,494km² in 2020/21. The Department has now entered a phase where the necessary management measures will be identified and introduced for terrestrial protected sites, and the focus between 2018 and 2022 will be on bringing the protected sites network into favourable management. The terrestrial figure for protected sites under favourable management 2020/21 shows continued growth due to the roll out of various environmental management agreements including the Environmental Farming Scheme.

In 2020/21, the area of terrestrial protected sites under favourable management in Northern Ireland was recorded as 304.04km² which has increased since the baseline year for PfG reporting (2015/16) when 2.63 km² of terrestrial protected sites were under favourable management and is considered a positive change for PfG reporting.

Marine Protected Sites Under Favourable Management

Figure 5.4 Marine protected sites under favourable management 2009/10 to 2020/21



Source: DAERA

Our marine protected areas help protect and improve our marine environment. These sites have been designated to protect sensitive and ecologically important species and habitats, and the on-going protection and management will ensure that these important natural assets can be enjoyed by this and future generations.

We have a range of protected area designations, representing features of national and international importance.

The area of marine protected sites under favourable management has shown an increasing trend since 2009/10. During this period, DAERA has been working on designating an ecologically coherent network of marine protected sites and this target is very close to being achieved. The total marine protected sites increased from 269km² in 2009/10 to 2,410km² in 2020/21. DAERA has now entered a phase where the necessary management measures will be identified and introduced for marine protected areas, and the focus between 2018 and 2022 is on bringing the protected area network into favourable management.

Measures to increase the percentage of marine protected areas (MPAs) under favourable management include:

- Developing conservation measures in MPAs in the Northern Ireland inshore region;

² A recalculation of the marine protected area network identified that the previously reported figure of 2566km² included part of the North Channel SAC that extended into the Northern Ireland offshore region. As MPA designation and management in the offshore region is not devolved, the area protected in the inshore region has been revised to 2,410km².

- Introducing measures to manage fishing activities in MPAs - DAERA has conducted a public consultation on proposed fisheries management measures, and is making progress towards the introduction of regulations to manage fishing activities in MPAs; and
- Providing oversight for the EU INTERREG VA Marine Protected Area Management and Monitoring (MarPAMM) project, to develop regional and cross border MPA management plans.

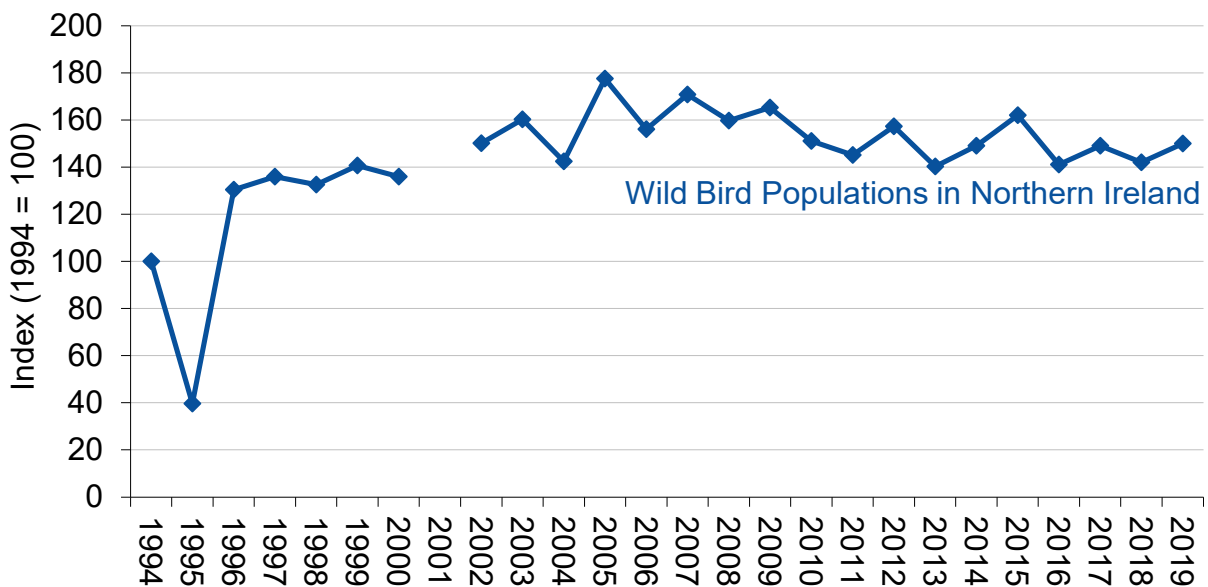
In 2020/21, the area of marine protected sites under favourable management in Northern Ireland was recorded as 115.00 square kilometres which has increased since the baseline year for PfG reporting (2015/16) when 83.62 square kilometres of marine protected sites were under favourable management and is considered a positive change for PfG reporting.

PfG summary for Terrestrial and Marine protected sites

The indicators for both Terrestrial protected sites under favourable management and Marine protected sites under favourable management are combined to form PfG indicator 45 and will be available on the PfG website. Combining the component indicators, population indicator 45 Biodiversity will be designated as positive (indicator improving).

Wild Birds

Figure 5.5 Change to wild bird populations in Northern Ireland, 1994 - 2019



Data Source: British Trust for Ornithology/NIEA

Northern Ireland's wild bird population is monitored as part of the UK BTO/JNCC/RSPB (British Trust for Ornithology/Joint Nature Conservation Committee/The Royal Society for the Protection of Birds) Breeding Bird Survey, which is undertaken annually at over 3,000 sites across the UK (119 in Northern Ireland during 2019).

Due to the nature of the data analysis, the number of species for which trends are available can vary year-on-year. In 2019 information on trends was available for 37 of the most common species. There is no figure for 2001, due to the impact that the foot and mouth outbreak had on the collection of data, i.e. observers not being able to access many rural areas. Trend data is available for three time periods: long-term (1995-2018), medium-term (2008-2018) and annual (2018-2019).

Between 1994 and 2018, the average population change amongst the 37 species for which the Breeding Bird Survey produces statistically robust trends in Northern Ireland showed a 50 percent increase. Between year changes varied considerably in size and direction between species. It should be noted that the Breeding Bird Survey is a sampling method with limited in scope in Northern Ireland and tends to produce robust trends only for our commoner species. Breeding Bird Survey methods are not ideal for estimating numbers of some groups of birds, such as birds of prey, waders and seabirds, and these are consequently under-represented in the index

Long-term trends show that some substantial increases by individual species have been recorded since Breeding Bird Survey began. It should be noted, however, that not all the populations contributing to the overall trend are increasing. Between 1995 and 2018, 17 of the 37 species have shown a statistically significant increasing trend while only two, Skylark and Greenfinch, have displayed a significant long-term decline. The long-term increases in Buzzard (1,305 percent) and Blackcap (1,540 percent) are particularly dramatic. Buzzards have undoubtedly benefitted from a reduction in

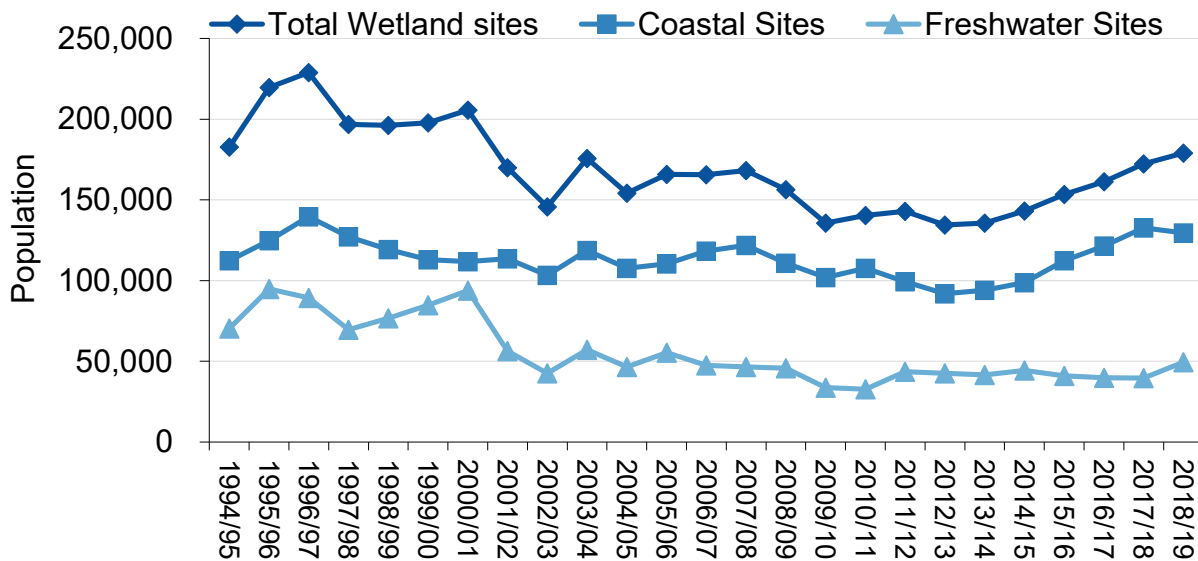
persecution and use of persistent pesticides since the 1970s, while the increase of the blackcap in Ireland is likely to be linked to a combination of climate change, earlier laying and a general increase and north-westerly spread of the breeding population in Great Britain.

The analysis of data for the medium-term indicates that numbers of Hooded Crow and Blackcap have increased by more than 50 percent during the last ten years, while those of Linnet and Lesser Redpoll have halved. Sedge Warbler and Swallow have also shown substantial declines during the same period. The decline of Greenfinch, largely driven by the effects of Trichomonosis, a disease carried by a protozoan parasite, has continued but now appears to be slowing, with an estimated decline of 4 percent in Northern Ireland between 2018 and 2019.

In the short term, five species, including Hooded Crow, Willow Warbler, Chiffchaff, Blackcap and Goldfinch showed statistically significant increases between 2018 and 2019. Although a number of species showed apparent declines between years, none were statistically significant.

Wetland Birds

Figure 5.6 Wetland bird populations in Northern Ireland, 1994/95 – 2018/19



Source: British Trust for Ornithology/NIEA

Between 1994/95 and 2018/19, the total wetland bird population of Northern Ireland has shown little overall change, having decreased by only 2 percent at monitored sites. However over that time, coastal populations increased by 15 per cent while freshwater populations declined by 30 per cent. The large decline recorded at freshwater sites is strongly influenced by the notable fall in wintering diving duck numbers at Lough Neagh.

The trend since last year's assessment has shown an increase of 4 per cent overall, with waterbird populations at coastal sites relatively stable, showing only a 2 percent decline. Freshwater figures, however, showed a substantial increase of 25 percent. The increase at freshwater sites was attributable to generally improved numbers across a range of waterfowl and wader species, but most diving duck species, Coot, Lapwing and Golden Plover all showed notable increases.

Coastal sites generally displayed changes in bird numbers of less than 10 percent. Variations at Carlingford Lough and Dundrum Inner Bay cannot be considered reliable due to changes in coverage by surveyors during 2018/19. The above figures highlight both the variability in usage by migratory waterbirds between years of many of these wetland sites and their continued importance.

Amongst our freshwater sites, peak waterbird numbers at Loughs Neagh and Beg increased by 26 percent. Numbers of several key species at Lough Neagh rose during 2018/19 but increases of over 80 percent in Coot and 108 percent in Pochard were particularly notable. Waders, particularly Lapwing and Golden Plover, also increased. In contrast, the lowest numbers of Scaup at Lough Neagh since 1985 were also recorded. Upper Lough Erne's numbers showed a similar level of increase to those at Lough Neagh and Lough Beg, with Canada Goose, Coot, Lapwing and Golden Plover substantially more abundant than in the previous winter. Despite the overall declines at

Lough Neagh in the past 15 years, this is still the most important site in UK for Pochard, and the second most important for Tufted Duck, Scaup and Goldeneye (based on current 5 year averages).

Indices of abundance derived from the Wetland Bird Survey show a recovery from the previous year's declines in most in duck species. This was most notable in Gadwall, Pochard and Goldeneye, in which index values increased by 23 percent, 27 percent and 25 percent respectively. Exceptions to this trend were Shelduck and Scaup, in which indices fell by 38 percent and 42 percent. The latter species is, however, liable to frequently change its wintering sites between years so its trends are difficult to interpret.

After a period of relatively high numbers, the index of Whooper Swan abundance again showed a substantial decline (-41 per cent) overall and may reflect poor breeding conditions in Iceland. The recent shallow decline in Canadian Light-bellied Brent Geese (for which the island of Ireland is the most important wintering location in the world) was reversed during 2018/19, with an increase in index value of 27 percent from the previous winter. This is also likely to be a consequence of variable reproductive success, which is typical of Arctic-breeding species.

In contrast to ducks, several wader species using coastal sites in Northern Ireland declined during the 2018/19 winter. Ringed Plover showed the largest decrease in index value from the previous season (52 percent). Other common waders also showing a substantial decrease were Oystercatcher (19 percent), Dunlin (41 percent), Knot (31 percent) and Black-tailed Godwit (20 percent). Curlew numbers continued to stabilise after their previous decline, showing a small increase in index value of 5 percent. Declines however continue to affect a number of our shorebirds. Knot numbers, which showed a notable recovery in the previous season, reversed that trend with a reduction of 27 per cent. Declines were also evident in Lapwing, Ringed Plover and Turnstone. The index value for Sanderling showed a large increase of 57 percent from the previous year. This may, however, reflect year to year variation in the timing and duration of the main migration period for this species, which predominantly winters to the south of Northern Ireland and may only be present in large numbers for a short time. Consequently, many Sanderling may be missed by the monthly surveys in some years. Another species which occurs predominantly occurs on passage in Northern Ireland, Greenshank, also increased notably by 28 percent.

The recovery shown by most gull species in the previous winter, following a general decline in 2016/17, was sustained by the larger species in 2018/19. Indices for Black-Headed Gull and Common Gull, however, decreased substantially by 20 percent and 30 percent respectively. Greater Black-backed Gull showed encouraging signs of recovery from its recent decline with an increase in index value of 19 percent.

Predominantly freshwater species which also recorded substantial increases in index value during 2018/19 included Great Crested Grebe (46 percent), Little Grebe (22 percent) and Coot (37 percent). It should be noted, however, that Great Crested Grebe numbers can be strongly influenced by weather conditions during surveys and between-year variation in apparent abundance can therefore be difficult to interpret.

Many of these site-specific increases and declines in species' abundance reflect changes at UK level suggesting these changes are driven by regional scale or international factors and may not be due to site related issues.

It is thought that milder winters throughout north-western Europe may be a factor behind some of these species declines here, resulting in their wintering closer to their breeding sites. While such migratory "short-stopping" by more easterly breeding species may be contributing to the fact that 32 per cent of European waterbird populations are declining (Waterbird Population Estimates, Wetlands International, 5th edition), it is likely that other factors such as loss of breeding habitat and poor breeding success are also involved

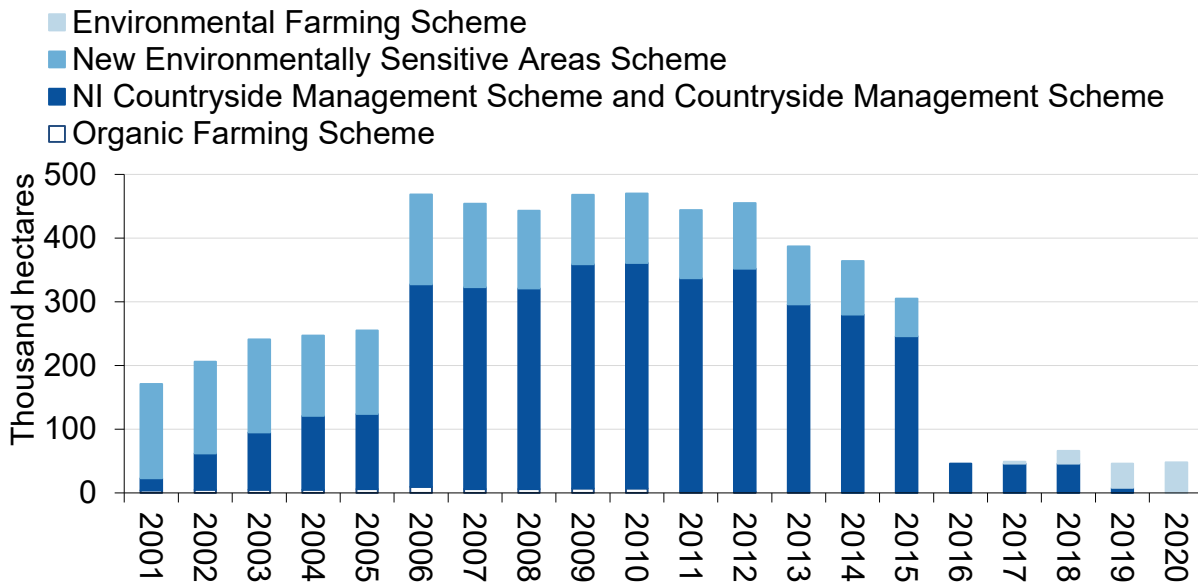
A recent UK report (CHAINSPAN) considered the effect of climatic changes to our most important ornithological sites. While ongoing declines of some species are anticipated e.g. as a result of changing migration patterns, populations of other species are expected to increase and overall, sites that have been and currently are important for our bird populations, will continue to be so. This underlines the need to continue to protect, maintain and enhance these sites through best management practices.

Northern Ireland's wetland bird populations are monitored as part of the UK Wetland Bird Survey (WeBS). This survey monitors non-breeding waterbirds across the UK, collectively identifying population sizes at local and regional scales, determining trends in numbers and identifying important sites for waterbirds. A similar scheme in the Republic of Ireland (I-WeBS) allows population monitoring at an all-Ireland level.

The data above are based on the nine main sites for non-breeding waterbirds in Northern Ireland. There are seven coastal sites namely: Belfast Lough, Carlingford Lough, Dundrum Bay (Inner), Larne Lough, Lough Foyle, Outer Ards shoreline, Strangford Lough and two freshwater sites namely Upper Lough Erne and Loughs Neagh and Beg. The figures used are the maximum monthly counts for each site over the winter survey period.

Sustainable Land Management

Figure 5.7 Northern Ireland agri-environment schemes, area under agreements, 2001 – 2020



Source: DAERA

Agri-environment schemes delivered by The Department of Agriculture, Environment & Rural Affairs (DAERA) are voluntary and support farmers and landowners to manage their land to benefit the environment.

In 2017 DAERA launched the Environmental Farming Scheme (EFS) (<https://www.daera-ni.gov.uk/topics/rural-development/environmental-farming-scheme-efs>). This is a voluntary scheme under the NI Rural Development Programme 2014-2020, which is part financed by the EU. It offers participants a 5-year agreement to deliver a range of environmental measures. The EFS has been designed to address specific environmental needs, primarily related to biodiversity, climate change and water quality. It is targeted and prioritised to deliver maximum environmental benefit and value for money.

The EFS has three levels:-

- A Higher Level, primarily for environmentally designated sites - Special Area of Conservation [SAC], Special Protection Area [SPA], RAMSAR, biological Areas of Special Scientific Interest [ASSI] and for priority habitats and species;
- A Wider Level to deliver benefits across the countryside, outside of environmentally designated areas; and
- A Group Level to facilitate co-operative action by Wider or Higher level farmers in specific areas such as environmentally designated areas, priority habitats, or river catchments.

Businesses can undertake to setup and manage a range of environmental measures in their EFS agreement. The first EFS agreements commenced on 1 July 2017, followed by Higher Level agreements on 1st January 2018. By the end of 2020 there are three tranches of the scheme with 4,700 agreements covering 47,700 hectares of land. There

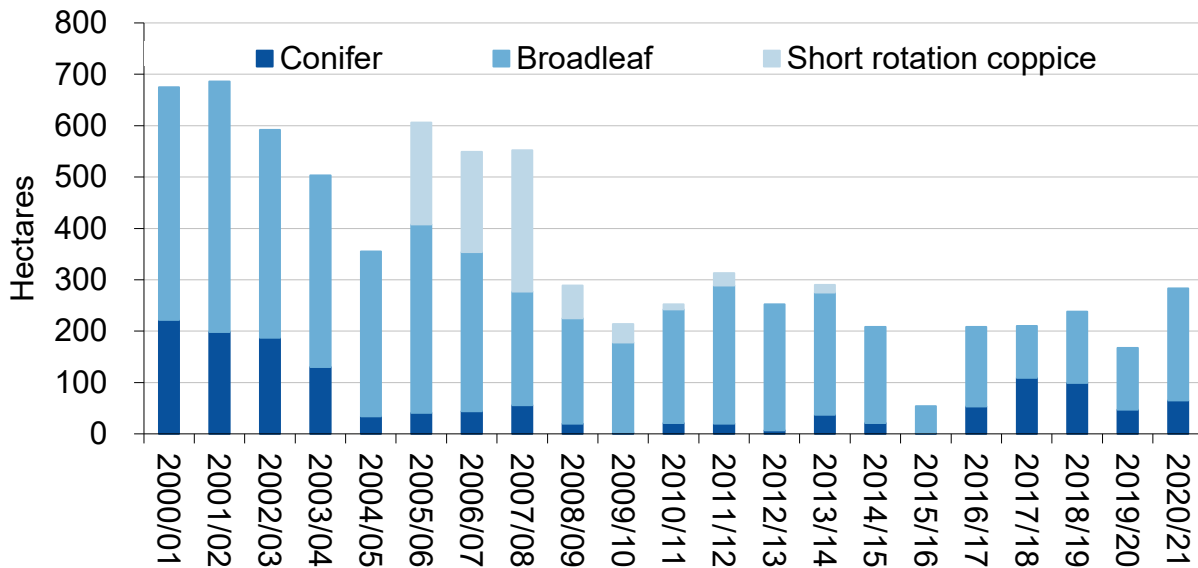
are 3,891 wider agreements covering 4,683 hectares and 774 EFS Higher Level agreements covering 43,035 hectares.

EFS Higher level agreements contain a site specific remedial management plan, with the aim of maintaining and enhancing the biodiversity value of the habitat. For example 1,700 hectares of breeding wader bird sites and 20,500 hectares of Moorland habitat (which includes blanket bog) are under appropriate management.

Under the EFS Wider Level by 2020 support was agreed for the completion of 2,400km of water quality measures (e.g. creation of riparian buffers and watercourse bank stabilisation). Agreements were in place for scheme options which cover Biodiversity actions to be carried out across 908 hectares of farmland. There is support being provided for climate change actions through agreements on Agro-forestry, tree corridor planting, and for 188km of new native hedgerow planting in 2020. The EFS also offers financial support to establish native woodland of up to five hectares in area, and farm businesses have established 180 hectares of new native woodland.

Area of Woodland

Figure 5.8 Area of new forest and woodland plantings by private landowners supported by grant aid, 2000/01 – 2020/21



Source: Northern Ireland Forest Service

In Northern Ireland, over 52 per cent of forests and woodlands are managed by Forest Service. <https://www.forestresearch.gov.uk/tools-and-resources/statistics/forestry-statistics/>

Grant support to encourage afforestation and sustainable management of non-Forest Service woodlands is provided by forestry measures in the 2014-2020 Rural Development Programme. In 2020/21 283 hectares of new woodland (65 hectares conifer and 218 hectares broadleaf) were planted and part funded by the European Commission under the Forestry Grant Schemes.

6 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. Waste can affect the environment through its visual impact or by emissions to the air, groundwater and surface water as well as the contamination of land.

This chapter reports on the amount of waste collected by local authorities which is sent for preparing for reuse, recycling, composting.

Key points in this chapter:

- In 2019/20, Northern Ireland's household waste recycling rate was 51.9 per cent. This was a 9.8 percentage point increase since the 2014/15 baseline year and is considered as a positive change for PfG reporting.
- The recycling rate for all waste collected, both household and non-household waste, was 51.1 per cent in 2019/20.

Other statistics related to waste collected by local authorities in Northern Ireland are available.

The [Local Authority Municipal Waste Management Statistics](#) show that amount of waste sent for [energy recovery](#) via incineration has grown exponentially since 2006-07, whilst the proportion of waste sent to [landfill](#) has more than halved in the same timescale.

[Data tables](#) and further information for this chapter can be found online.

Recycling (preparing for reuse, dry recycling and composting)

Figure 6.1 Waste sent for preparing for reuse, dry recycling and composting, 2005/06 – 2019/20



Source: DAERA

Note: reuse was included with recycling and composting from 2012/13 onwards. The impact was small, adding less than 0.1 percentage points to the NI rate.

Reuse, dry recycling and composting (referred to as 'recycling' for the rest of this section) is based on materials collected for recycling at the kerbside, civic amenity sites, bring sites and those collected by a third party, such as charities/voluntary groups. Recycling of waste is becoming much more common in Northern Ireland. The revised Northern Ireland Waste Management Strategy (Delivering Resource Efficiency, 2013) proposed to achieve a 50 per cent recycling rate by 2020 for local authority collected household waste.

In 2019/20, the tonnage of local authority collected municipal waste sent for preparing for reuse, dry recycling and composting reached a record high at 510,374 tonnes. The recycling rate was 51.1 per cent. This was an increase on the 49.8 per cent recycling rate recorded in 2018/19.

The recycling rate for household waste was 51.9 per cent in 2019/20. Again, this was an increase on the 2018/19 recycling rate of 50.0 per cent whilst the tonnage sent for recycling recorded a new high of 456,855 tonnes. The proportion of household waste sent for preparing for reuse was 0.1 per cent, dry recycling made up 24.1 per cent and composting was 27.7 per cent. The household waste recycling rate is an indicator in the Programme for Government (PfG) framework. The criteria used to report change for this indicator is +/- 0.5 percentage points cumulatively on an annual basis against the baseline year value in 2014/15, when the household waste recycling rate was 42.0 per cent. In 2019/20, Northern Ireland's household waste recycling rate was 51.9 per cent. This was a 9.8 percentage point increase since the 2014/15 baseline year and is considered as a positive change for PfG reporting.

7 Built Heritage

Northern Ireland has a rich heritage of archaeological sites, monuments and buildings representing the aspirations and achievements of past societies, 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.

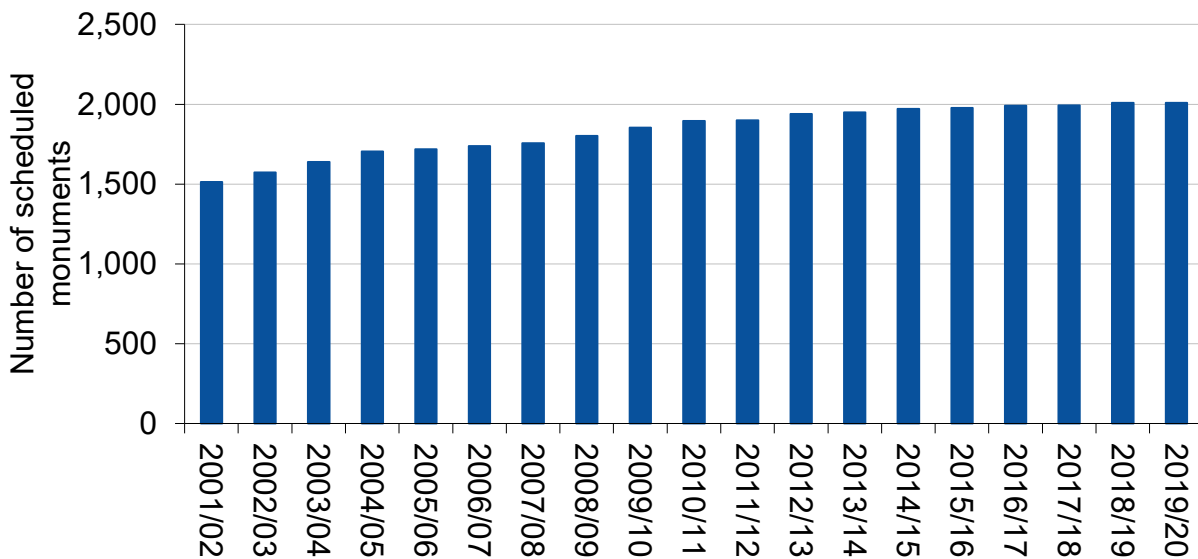
Key points in this chapter:

- In 2019/20, there were a total of 2,008 scheduled historic monuments protected under Article 3 of the Historic Monuments and Archaeological Objects (NI) Order 1995. Overall there has been a 33 per cent increase in the number of scheduled monuments since 2001/02.
- Listed buildings are those of special architectural or historic interest, and provide an indication of the extent of this historical architectural resource. There has been a modest increase in the number of buildings listed in recent years with a total of 8,994 statutory listings in 2019/20, compared with 8,191 in 2003/04.
- Buildings that are classified as 'at risk' in Northern Ireland are recorded on the online Built Heritage at Risk in Northern Ireland (BHARNI) database. In 2019/20, there were 620 listed buildings and structures on this database, and 19 buildings had been removed from the list in the last year because they were conserved. During 2019/20, £322,820 in funding was spent on 17 grants.

[Data tables](#) and further information for this chapter can be found online.

Monuments

Figure 7.1a Total number of scheduled historic monuments, 2001/02 – 2019/20



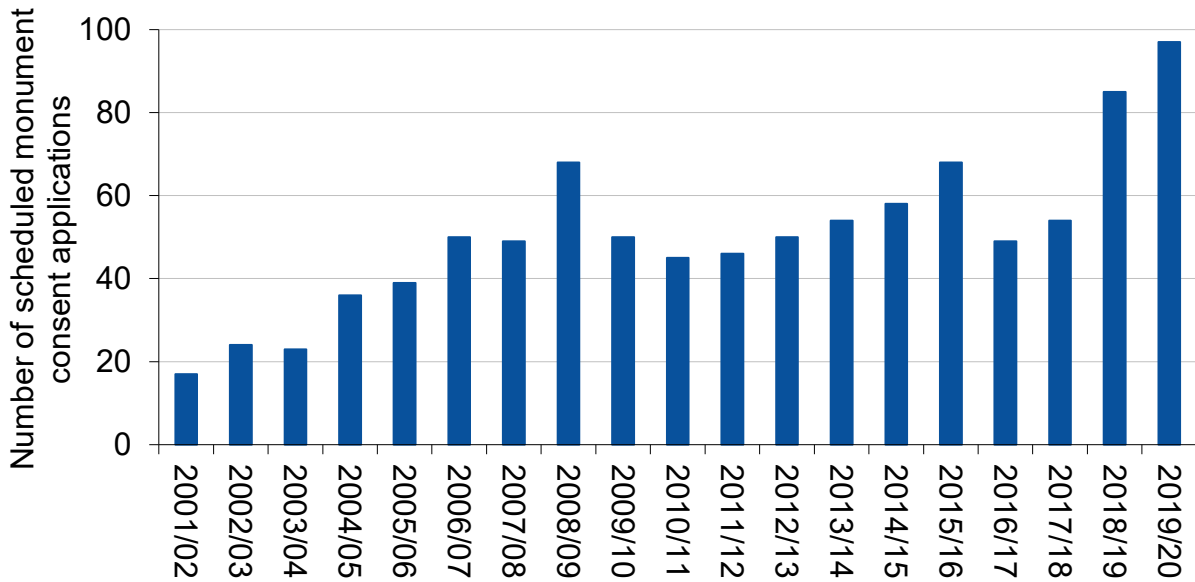
Source: DfC Historic Environment Division

Scheduled historic monuments comprise a selection of the most important or most rare and vulnerable of our archaeological sites. They include a range of site types, such as megalithic tombs, prehistoric and early Christian ritual and settlement earthworks, church and castle ruins and features of industrial, defence or maritime heritage importance. These sites are generally in private ownership and the purpose of scheduling is to provide statutory protection to them and to improve or stabilise their condition through advice and guidance. Monuments are monitored for condition and risk by field monument wardens. From April 2015, a risk based inspection regime has been employed ensuring that the most vulnerable monuments receive increased inspections aimed toward improving their condition.

There were no monuments newly scheduled during 2019-20. The recorded numbers of scheduled monuments have increased since 2001/02 reflecting ongoing survey, designation and assessment. The figures provide an indication of this aspect of the rich cultural and built heritage of Northern Ireland, an increasingly important source of “soft power” and an important contributor to the Northern Ireland economy, through attracting tourism and filming. Overall there has been a 33% increase in the number of scheduled monuments rising from 1,513 in 2001/02 to 2,008 in 2019/20.

The trend is a general increase as new sites are selected for scheduling each year, against criteria established in policy (<https://www.communities-ni.gov.uk/publications/criteria-scheduling-historic-monuments-and-listing-buildings-special-architectural-or-historic>) and to better reflect and protect the array of cultural heritage across Northern Ireland. Amendments to existing entries in the schedule are also occasionally made on the basis of new evidence. Scheduled monuments are managed by their owners under Historic Environment Division guidance.

Figure 7.1b Number of scheduled monument consent applications received, 2001/02 – 2019/20

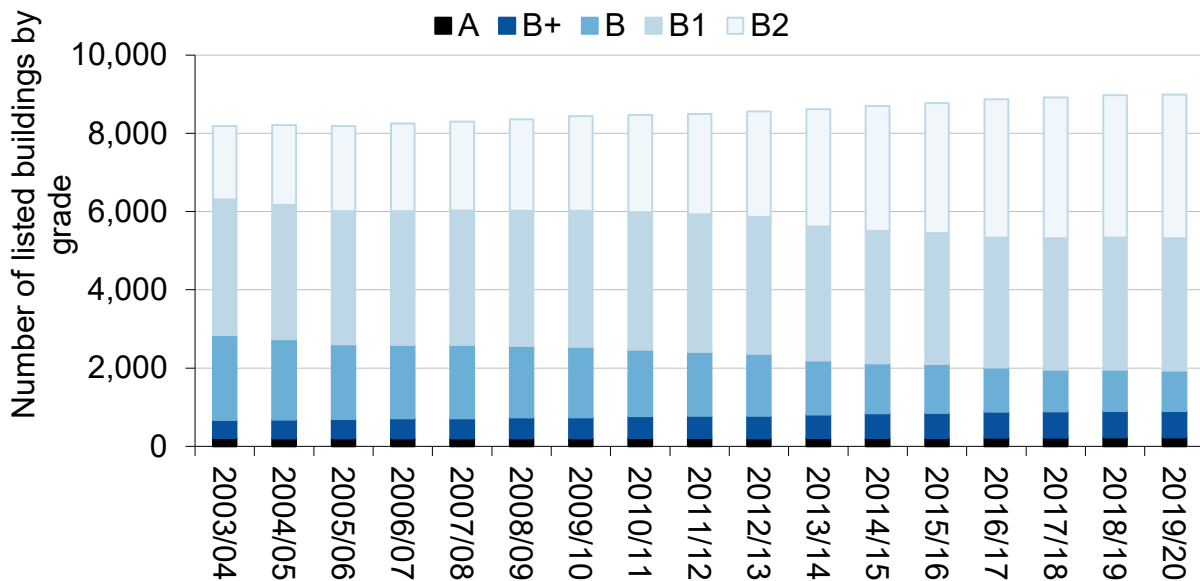


Source: DfC Historic Environment Division

Scheduled monument consent must be sought for proposed works which may alter or disturb the fabric of a scheduled historic monument, or its ground surface. Scheduled historic monuments are predominantly located in rural areas and most owners tend to come from within the agricultural sector. Prior to 2004/05, applications for consent ran at numbers below 30 per year. From 2006/07 to 2017/18, applications ranged from 45 to 70. Application numbers increased in 2018/19 and reached 97 in 2019/20, the highest number presented in the time series above. An increase in government and local council projects, such as trails and site infrastructure, to aid well-being and tourism activities is one reason for this increase.

Listed Buildings

Figure 7.2 Number of listed buildings by grade, 2003/04 – 2019/20



Source: DfC Historic Environment Division

Listed buildings are those of special architectural or historic interest and represent our most important historic buildings.

All of Northern Ireland was surveyed between 1970 and 1995 and suitable buildings were protected by listing. Such structures can range from large stately homes to small gate screens but all must meet the test of Section 80 of the Planning Act (Northern Ireland) 2011 that they must be of 'special architectural or historic interest'.

The number of listed buildings in 2019/20 was 8,994, an increase of 10% compared to 2003/04 (8,191). Some listings include multiple buildings, therefore, the total number of buildings protected in this way is slightly higher.

A second, area based survey of all historic buildings (the Second Survey) has been underway since 1997 and is largely responsible for the increase. However, it should be noted that a significant number of buildings have also been found to no longer meet the legislative test as part of this process and have therefore been removed.

Budget to carry out the survey significantly reduced in 2014/15 and the increase in subsequent years is due to the processing of existing records. That is likely to reduce over the next few years as this reserve of data is exhausted.

The number of grade B buildings is expected to continue to reduce over time. Most of these buildings are churches which were ineligible for grant aid in 1986 when the B category was split into grade B1 and B2 for grant purposes. Grade B buildings are being allocated to either the B1 or B2 category as part of the Second Survey.

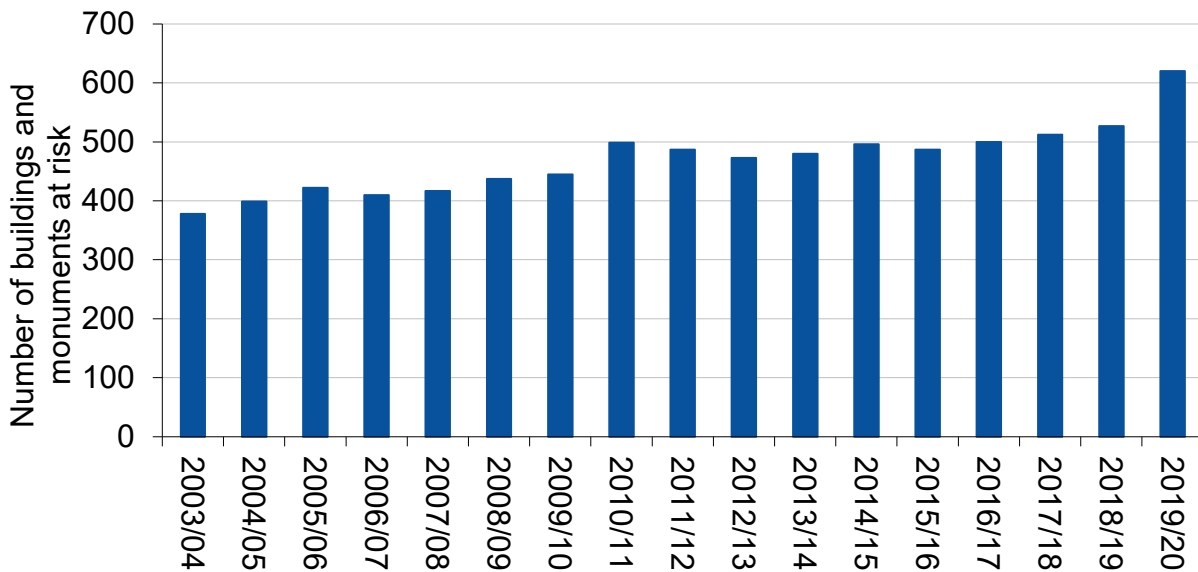
More detail on the grading of listing buildings can be found on page 17 of 'Criteria for the Scheduling of Historic Monuments and the Listing of Buildings of Special Architectural or

Historic Interest, with associated procedures' (May 2019): <https://www.communities-ni.gov.uk/publications/criteria-scheduling-historic-monuments-and-listing-buildings-special-architectural-or-historic>.

Records of all listed buildings are published on the Northern Ireland Buildings Database at: www.communities-ni.gov.uk/services/buildings-database

Buildings and Monuments at Risk

Figure 7.3 Number of buildings and monuments at risk, 2003/04 – 2019/20



Source: DfC Historic Environment Division

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: the Heritage at Risk in Northern Ireland (HARNI) register.

The HARNI register provides an indicator of changes in the number of buildings judged to be at risk. Significant effort was put into updating records in 2019/20 resulting in an increase in the number of buildings and monuments recorded as being at risk. In 2019/20, there were 620 buildings and structures on the HARNI database, an increase of 93 compared to 2018/19.

The number of buildings on the register can be expected to rise as more detailed information is made available through surveys.

Between 2003/04 and 2019/20, 305 buildings and monuments were removed from the list because they were conserved.

National Statistics

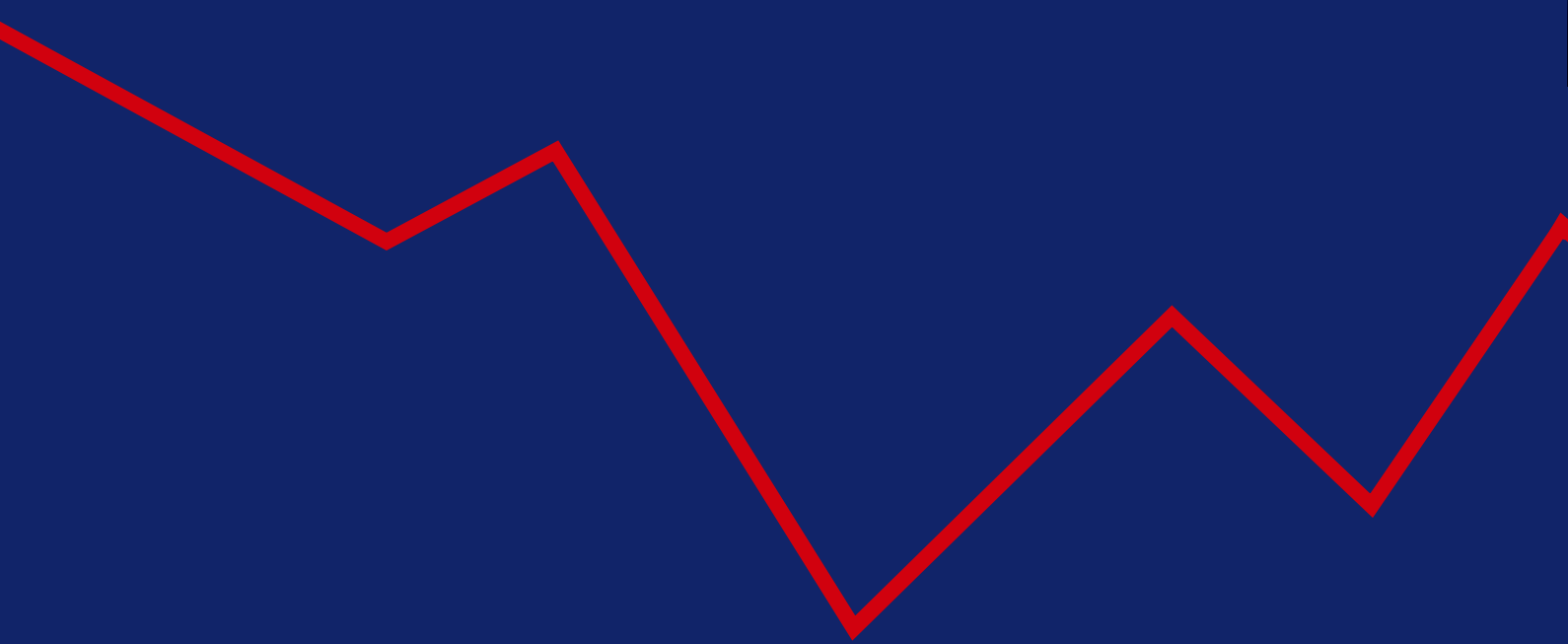
National Statistics status means that our statistics meet the highest standards of trustworthiness, quality and public value, and it is our responsibility to maintain compliance with these standards.

These statistics were first designated as National Statistics, and underwent a full assessment against the Code of Practice, in September 2013 by the UK Statistics Authority <https://www.statisticsauthority.gov.uk/publication/statistics-on-the-environment-and-waste-management-in-northern-ireland>

No official compliance checks have been completed since, however, we have continued to comply with the Code of Practice since designation and have made the following improvements:

- Added more value by consulting on the report in 2017 [<https://www.daera-ni.gov.uk/consultations/consultation-ni-environmental-statistics-report>] and attending and presenting at the DAERA statistics user group meeting [[DAERAstats-user-group](#)].
- Ongoing quality assurance of the indicators contained within the report by reviewing methods and indicators annually.
- Improved statistical output by creating infographics to accompany the report and tables <https://www.daera-ni.gov.uk/publications/northern-ireland-environmental-statistics-report-2021>.
- Sought and implemented recommendations from GSS good practice team to improve the publication.
- In 2020, consulted with senior managers and internal users to streamline the content to concentrate on first released statistics and PfG indicators.

Policy, Economics and Statistics Division
Department of Agriculture, Environment and Rural Affairs
Dundonald House
Upper Newtownards Road
Ballymiscaw
BELFAST BT4 3SB



Department of
**Agriculture, Environment
and Rural Affairs**

www.daera-ni.gov.uk



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