PROPOSED AMMONIA STRATEGY & REVISED OPERATIONAL PROTOCOL FOR NORTHERN IRELAND

Strategic Environmental Assessment

Environmental Report

Department of
Agriculture, Environment and Rural Affairs

An Roinn
Talmhaíochta, Comhshaoil agus Gnóthaí Tuaithe

Depairtment o'
Fairmin, Environment an' Kintra Matthers

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The consultation will run for an 8-week period from 28 February to 25 April 2025.

The deadline for responses to this consultation is 23.59 on 25 April 2025. All responses should be received by then to ensure they can be fully considered.

If you require any further information, please email ammonia@daera-ni.gov.uk or contact Kieran McManus on 028 9052 4528.

Contents

Non-Technical Summary

This section provides a non-technical summary of the Strategic Environmental Assessment process, a summary of the likely significant effects of the Proposed Ammonia Strategy and Revised Operational Protocol and a statement on the difference the process has made to-date.

(a) An outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes.

The Proposed Ammonia Strategy

The vision, objective and outcomes of the Proposed Ammonia Strategy are set out below. The Proposed Ammonia Strategy contains mandatory and voluntary measures to reduce ammonia emissions from agriculture in Northern Ireland. The measures are summarised below and set out in detail in the Update on the Proposed Ammonia Strategy which has been published alongside this report.

Vision of the Proposed Ammonia Strategy

The vision of the Proposed Ammonia Strategy is to deliver sustained reductions in ammonia to protect nature, meet Northern Ireland's legal obligations, and to ensure a sustainable agri-food sector.

Objective of the Proposed Ammonia Strategy

The objective of the Proposed Ammonia Strategy following consultation, as part of the Combined Approach to Ammonia, is proposed as:

• To put Northern Ireland agriculture on a pathway to meet the UK National Emissions Ceiling Regulations (NECR) 20181 target for reductions in ammonia emissions by 2030.

Outcomes of the Proposed Ammonia Strategy

The outcomes of the Proposed Ammonia Strategy, following consultation, for ammonia emissions to 2030 and 2050, are:

- By 2030 - To meet the UK's NECR emission reduction target to 2030.
- By 2050 - Ammonia emissions reduced to a point where critical loads of nitrogen deposition and critical levels of ammonia are not being exceeded at any designated sites

The National Emission Ceilings Regulations (NECR) 2018 set out the UK's national emission reduction commitment in 2030, which is a 16% reduction in ammonia compared to the base year of 2005. Using the most recent National Atmospheric Emissions Inventory (NAEI) data for 2022, a 16% reduction in the 2005 baseline ammonia emissions from agriculture means that the NI agricultural ammonia emissions target for 2030 is 24.17 kt. This 16% reduction, expressed in kilotonnes, and as a percentage of the most recent 2022 NAEI data, is set out in Box 1.

Box 1. The 2030 Target for NI agricultural ammonia emission reductions

- A **16% reduction** in the 2005 baseline agricultural ammonia emissions of **28.77 kt**.
- Equates to agricultural ammonia emissions **reducing to 24.17 kt by 2030**.
- Equates to agricultural ammonia emissions **reducing by 6.69 kt reduction from 2022 levels**.
- Equates to agricultural ammonia emissions **reducing by 22% of 2022 levels**.

The Revised Operational Protocol

The Revised Operational Protocol (OP) will provide a framework for decision-making with regards to air pollution impacts on sensitive habitats and protected sites of ecological importance. These potential impacts are required to be highlighted in planning applications and examined by competent authorities when these applications are assessed. Air pollution impacts are chiefly of concern around:

- Agricultural activities, where there is handling, storage and spreading of livestock manures (ammonia emissions);
- Road schemes (nitrogen oxide emissions from vehicle exhausts);

- Industry (emissions produced from installations that are not otherwise covered by Industrial Emissions legislation – this applies in particular to 'Medium Combustion Plants').

The impacts of installations, for example, those based around industry and intensive farming, are also considered in the course of Pollution Prevention and Control (PPC) permitting, whether this is in the course of initial permitting, or periodic permit review.

The Revised OP framework will use the most up-to-date and robust scientific evidence on the impacts of air pollution on the natural environment, and it will enable DAERA and competent authorities to fully comply with relevant environmental obligations. The Revised Operational Protocol reflects the most up to date evidence available and if new evidence emerges it will be taken into consideration.

The damage thresholds used for assessment in the Revised OP are, in general, lower (stricter / more conservative) than in the previous protocol. However, in planning applications where these de-minimis thresholds are exceeded, the approach looks at Site-Relevant Thresholds.

Site-Relevant Thresholds take into account local environmental conditions and the amount of pre-existing activity (development pressure) near to proposals. They can offer flexibility by setting higher (more lenient) damage thresholds, where development pressure is low.

Objective of the Revised Operational Protocol

The Revised OP aims to provide a framework for assessing air pollution impacts that is based on the most up-to-date scientific evidence, enabling DAERA to fully comply with all relevant legal obligations around protecting and improving the natural environment. The Revised OP also aims to promote consideration of mitigation measures for reducing emissions or their impacts.

Proposed outcomes of the Revised Operational Protocol

The Revised OP will deliver increased protection from air pollution for designated sites in the natural environment (for example, peatlands), as well as promoting agricultural sustainability in Northern Ireland.

Relationship with other relevant plans and programmes

Assessing the relationship of the Proposed Ammonia Strategy and Revised Operational Protocol with the existing International, European and National framework of plans, programmes and policies, and identifying gaps and conflicts is a key part of the SEA process.

This includes the consideration of statutory and non-statutory environmental protection objectives.

Appendix A sets out, for each of the plans and programme listed below, a high-level description, the key objectives of the plan or programme, and the relationship with the Proposed Ammonia Strategy and Revised Operational Protocol.

International Level

1. The Convention on Wetlands – The Ramsar Convention
2. Bern Convention (Convention on European Wildlife and Natural Habitats) (1982)
3. UN Convention on Biological Diversity (1992)

UK Level

4. National Emission Reduction Commitments Directive (NEC) Directive (2016/2284/EU)

National Level

5. The Conservation (Natural Habitats, etc.) Regulations 1995 (Northern Ireland) ('Habitats Regulations')
6. The Environment (Northern Ireland) Order (2002)
7. The PPC (IE) Regulations (NI) 2013
8. The Wildlife and Natural Environment Act NI (2011)
9. The Air Quality Standards Regulations (Northern Ireland) 2010
10. The DAERA Plan to 2050 - Sustainability for the Future
11. The draft Green Growth Strategy for Northern Ireland
12. The Environmental Improvement Plan for Northern Ireland
13. The draft Nature Recovery Strategy
14. The Nutrients Action Programme (NAP)
15. The Sustainable Agriculture Programme
16. The draft Clean Air Strategy for Northern Ireland
17. North Atlantic Salmon Conservation Organisation (NASCO), Convention for the Conservation of Salmon in the North Atlantic Implementation Plan 2019-2024
18. The Fisheries Act (NI) 1966 (as amended)
19. The Nitrogen Futures Report
20. The Scottish Nitrogen Balance Sheet
21. Nitrogen Impacts in Natural Ecosystems (NINE)
22. Ireland's 5th Nitrates Action Programme 2022-2025

23. Lough Neagh Report and Action Plan

(b) The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme.

The Current State of the Environment

Section 4 of the report sets out the current state of the environment in terms of the baseline and environmental issues, grouped according to each SEA Theme. A wide range of information is available providing information on the current state of the environment, of relevance to the Proposed Ammonia Strategy and Revised Operational Protocol.

A summary of the status of key environmental metrics and the likely environmental impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented is set out below for each SEA Theme.

Box 2. Biodiversity, flora and fauna

SEA Theme 1 – Biodiversity, flora and fauna

Key Environmental Issues

- Declines in farmland bird species, bryophyte distribution and wintering waterbirds.
- Species on the IUCN Regional Red List at risk of extinction.
- 36% of features in Marine and Terrestrial protected sites in Unfavourable condition.
- Only one of the 49 Annex 1 habitats in Northern Ireland reported to be in Favourable condition.
- Threats to habitat conservation status from agriculture, climate change, development, air pollution and invasive species.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- The pace of addressing the issues listed and the degree of potential environmental improvement will be lessened, i.e greater environmental detriment will occur.

Box 3. Human Health

SEA Theme 2 – Population and human health

Key Environmental Issues

- Water quality – see section 4.4.3.
- Air quality – see section 4.4.5.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Increased risk of direct and indirect effects on human health, see Section 4.4.5 SEA Theme 5 – Air.

Box 4. Water

SEA Theme 3 – Water

Key Environmental Issues

- The Blue Green Algae Crisis.
- Increasing levels of soluble reactive phosphorus in the 93 Surveillance Rivers to 0.062 mg/l in 2023.
- Less than one third of Northern Ireland's rivers with good ecological status in 2021, representing no improvement since 2015.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Reduced ability to lessen losses of ammonia and nitrogen to the environment in Northern Ireland.

Box 5. Soil

SEA Theme 4 – Soil

Key Environmental Issues

- Potential for effects on soil nutrient levels.
- Potential for effects on nitrate and phosphate vulnerability of soils (and associated groundwater susceptibility).
- Potential influence of soil type on land use practices (e.g. fertiliser application).
- Potential for effects on discharges to receiving aquatic sediments.
- Potential for effects on land use within agricultural holdings.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Reduced ability to tackle the key environmental issues impacting on soils

Box 6. Air

SEA Theme 5 – Air

Key Environmental Issues

- Levels of $PM_{2.5}$ are above WHO guideline levels at 7 of the 8 sites where $PM_{2.5}$ is monitored in Northern Ireland.
- 100% of SACs and ASSIs and 98.6 of SPAs are exceeding their Critical Levels of ammonia concentration.
- 100% of SACs and ASSIs and 99.5% of SPAs are exceeding their Critical Loads for nitrogen deposition.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Increased risk of negative human health outcomes from the direct and indirect effects of ammonia emissions.
- There would continue to be exceedances of the Critical Levels of ammonia and Critical Loads for nitrogen deposition in almost all SACs, SPAs and ASSIs in Northern Ireland.

Box 7. Climatic factors

SEA Theme 6 – Climatic factors

Key Environmental Issues

- Risks to habitats and species.
- Risks to soil health.
- Risks to carbon stores and sequestration.
- Knock-on effects from risks to livestock, crops and trees.
- Knock-on effects from risks to supply chains.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Increased impact of ammonia as an indirect Greenhouse Gas.
- Increased impact of ammonia and nitrogen deposition on the risks and knock-on effects listed above

Box 8. Material Assets

SEA Theme 7 – Material Assets

Key Environmental Issues

- Impact of ammonia and other pollutants from built assets.
- Impact of ammonia on ecosystem health of material assets including the flood attenuation and water storage capabilities of peatlands.
- Impact of ammonia on ecosystem health of material assets including ancient woodland tree health, associated invertebrate species and release of soil carbon to the atmosphere.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Increase in environmental damage caused by air pollution from built assets.
- Increase in environmental damage caused by air pollution from natural assets eg farming activities.
- Increase in environmental damage caused by air pollution to natural assets eg woodlands, peatlands.
- Increase in environmental damage to natural assets described in the Northern Ireland Countryside Survey, as a result of agricultural conversion and rural building.

Box 9. Landscape

SEA Theme 8 – Landscape

Key Environmental Issues

- Pressures on landscapes from a broad range of sources including urban expansions and development, housing, agricultural activities, industrial development, wind energy, mineral extraction, transport infrastructure, and the degradation of the natural features, for example through environmental pollution.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Increased risk of landscape damage from air pollution, including ammonia, from plans and projects of the types listed above.
- Increased risk of peatland damage from air pollution, including ammonia, from plans and projects of the types listed above.

Box 10. Cultural Heritage

SEA Theme 9 – Cultural Heritage including architectural and archaeological heritage

Key Environmental Issues

- Risks to condition of archaeological sites and monuments from activities including uncontrolled new, built development and certain agricultural practices.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Increased risk of damage to archaeological heritage from plans, projects and certain agricultural practices.

(c) The environmental characteristics of areas likely to be significantly affected.

Environmental Characteristics of areas likely to be significantly affected

By March 2024, 111,159 hectares across 394 sites were declared Areas of Special Scientific Interest (ASSI). 246,300 hectares across 58 sites were declared Special Areas of Conservation (SACs) and 114,600 hectares across 16 sites as Special Protection Areas (SPAs). 77,700 hectares across 20 sites were declared Ramsar sites (areas of wetland and waterfowl conservation), and 26,178 hectares across 5 sites as Marine Conservation Zones (MCZs).

Terrestrial and marine protected sites contain features listed in Table 2, which are important environmental characteristics and likely to be significantly affected by the Proposed Ammonia Strategy and Revised Operational Protocol, with the degree of significance varying according to the specific location of the site.

Table 1. Feature Types

Feature Type		
Habitats	**Species**	**Earth Science**
Bogs	Birds	Earth Science
Coastal	Fish	
Freshwater	Invertebrates	
Grasslands	Marine Mammals	
Heathlands	Non-Vascular Plants	
Inland Rock	Terrestrial Mammals	
Marine	Vascular Plants	
Fen, marsh & swamp		
Woodlands		

(d) Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC.

Existing Environmental Problems Relevant to the Plan or Programme including areas designated under Directives 79/409/EEC and 92/43/EEC

Areas designated under Directive 79/409/EEC – this requires SPAs to be designated and relates to the conservation of all species of naturally occurring birds in the wild state.

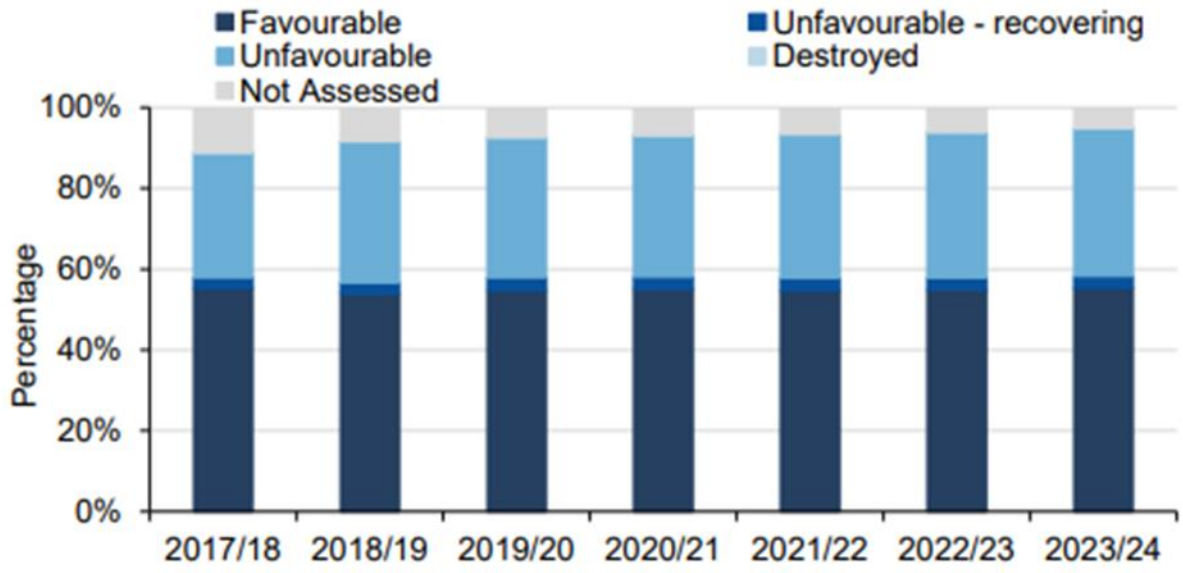
Areas designated under Directive 92/43/EEC – The Habitats Directive. DAERA is responsible for compliance with The Conservation (Natural Habitats, etc.) Regulations 1995 (Northern Ireland) ('Habitats Regulations') as amended by The Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019, which is the relevant law with respect to habitats and species in Northern Ireland following EU Exit.

The Habitats Regulations set out legislative provisions for the protection of European sites (SACs and SPAs). These regulations require competent authorities, public bodies, and decision-

makers to agree to a plan or project only after having ascertained that it will not adversely affect the integrity of European site features.

The Northern Ireland Environmental Statistics Report 2024 – Biodiversity and Land, finds that:

- In 2023/24, 55 per cent of features within Marine and Terrestrial protected sites were in Favourable condition while 36 per cent were in Unfavourable condition. Some 3 per cent were in Unfavourable-Recovering condition with less than 1 per cent Destroyed, shown below.
- The wild bird population indicator using 56 bird species shows decreased levels in 2022 compared to 1996. Bird populations peaked in 2005 and have been in decline since, driven principally by bird species found in farmland habitats.



Source: NIEA

Figure 1. Condition of Features within Marine and Terrestrial protected sites, 2017/18 – 2023/24.

(e) The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation.

Relevant Environmental Protection Objectives – how they have been taken into account

Table 2. Environmental Protection Objectives

Plan/Programme/Policy	Environmental Protection Objectives	How they have been taken into account in the Proposed Ammonia Strategy (AS) and Revised Operational Protocol (OP)
The Convention on Wetlands – The Ramsar Convention	The conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world.	The AS and OP will both have positive impacts for the conservation of wetlands by reducing levels of ammonia and nitrogen deposition.
Bern Convention (Convention on European Wildlife and Natural Habitats) (1982)	Objectives are to conserve wild flora and fauna and their natural habitats, as well as to promote European co-operation in this field.	The AS and OP will both have positive impacts for nature conservation by reducing levels of ammonia and nitrogen deposition.
UN Convention on Biological Diversity (1992)	Conservation of biodiversity from genetic resources. Development of national strategies for the conservation and sustainable use of biological diversity.	The AS and OP will both have positive impacts for biodiversity by reducing levels of ammonia and nitrogen deposition.
National Emission Reduction Commitments Directive (NEC) Directive (2016/2284/EU)	A national reduction commitment to 2030 for ammonia of a 16% reduction based on 2005 levels, under Regulation 6(3).	The AS target reduction in total agricultural ammonia emissions by 2030 arises from the NEC national reduction commitment to 2030. Decreasing ammonia emissions will be a material consideration in considering impacts from developments through the use of thresholds in the OP.

The Conservation (Natural Habitats, etc.) Regulations 1995 (Northern Ireland) ('Habitats Regulations')	These regulations require competent authorities, public bodies, and decision-makers to agree to a plan or project only after having ascertained that it will not adversely affect the integrity of European site features.	The AS will reduce the number of designated habitats exceeding their Critical Levels of ammonia and Critical Loads of nitrogen deposition as a result of the NI-wide reductions in ammonia emissions. The OP delivers DAERA's duty to protect sites from adverse effects (in this case from air pollution) under the regulations.
The Environment (Northern Ireland) Order (2002)20	Outlines provisions relating to the duty on the Department and other public bodies 'to take reasonable steps, consistent with the proper exercise of the body's functions, to further the conservation and enhancement of the flora, fauna or geological, physiographical or other features by reason of which the ASSI is of special scientific interest'.	The AS will reduce total agricultural ammonia emissions at an NI wide level, in line with the UK Emission Reduction Commitments. This will lead to a reduction in the Critical Levels and Critical Loads at ASSIs. The OP will be in line with this legislation and will assist the Department in fulfilling relevant statutory duties set out in this legislation.
The PPC (IE) Regulations (NI) 2013	Require industrial and agricultural activities with high pollution potential to hold and maintain an environmental permit and meet certain environmental conditions.	Achievement of the AS objective of reducing overall ammonia emissions will lead to reductions in ammonia at designated sites, related to PPC Regulations through the OP as below. The OP provides the framework for authorisations (permitting) under the PPC (IE) Regulations (NI) 2013 and the conditions under which nitrogen emitting developments/activities may take place, to safeguard against environmental damage.
The Wildlife and Natural Environment Act NI (2011)	To further the conservation of biodiversity.	The AS will contribute to reductions in the number of designated sites experiencing exceedances of their Critical Loads of nutrient nitrogen and Critical Levels of ammonia, thereby improving the status of the habitats to facilitate improved nature recovery. The OP, through decreasing or minimising harmful impacts of air pollutants on designated sites, will assist the Department in its duty under

		the Act of furthering the conservation of biodiversity as far as is consistent with the proper exercise of its functions.
The Air Quality Standards Regulations (Northern Ireland) 2010	Monitoring and compliance with Air Quality Directives.	The AS and OP will contribute to compliance with Air Quality Standards Regulations (Northern Ireland) 2010 through a reduction in levels of particulate matter that is formed from ammonia emissions.
The DAERA Plan to 2050 - Sustainability for the Future, published May 2021.	Strategic priorities are: •To enhance our food, forestry, fishery, and farming sectors using efficient and environmentally sustainable models which support economic growth. •To protect and enhance our natural environment now and for future generations whilst advocating its value to and wellbeing for all. •To champion thriving rural communities that contribute to prosperity and wellbeing. •To be an exemplar, people focused organisation, committed to making a difference for the people we serve.	Sets the context for the AS to plan the way forward to reduce ammonia emissions from agriculture to support local farm businesses and rural communities and help them to thrive and be sustainable, while at the same time protecting the environment. The OP will protect our natural environment and ensure sustainable development, in line with the DAERA Plan to 2050.
The draft Green Growth Strategy for Northern Ireland	Its aim is to ensure future government policy making here has climate and environmental action at its core, embracing and enabling science and innovation to drive solutions.	The AS is aligned with the draft Green Growth Strategy's aims of embedding environmental considerations into decision making and ensuring new policies address biodiversity commitments. The OP will protect our natural environment, contribute to protection of biodiversity and ensure sustainable development, in line with the draft Green Growth Strategy.
The Environmental Improvement Plan for Northern Ireland	Strategic Environmental Outcomes:	Where applicable EIP actions and targets have been included as Strategic Environmental

	1. Excellent air, water & land quality. 2. Healthy & accessible environment & landscapes everyone can connect with & enjoy. 3. Thriving, resilient & connected nature and wildlife. 4. Sustainable production & consumption on land and at sea. 5. Zero waste & highly developed circular economy. 6. Net Zero greenhouse gas emissions & improved climate resilience and adaptability	Objectives against the relevant SEA Theme.
The draft Nature Recovery Strategy	To meet the '30 by 30' target in the Kunming-Montreal Global Biodiversity Framework.	The AS and OP will contribute to reductions in the number of designated sites currently experiencing exceedances of their Critical Loads of nutrient nitrogen and Critical Levels of ammonia, thereby improving the status of the habitats to facilitate improved nature recovery.
Sustainable Agriculture Programme	The new programme will support and encourage the development of an agricultural industry with increased productivity, improved environmentally sustainable, resilient, and integrated into an effective functioning supply chain.	Various measures within the Sustainable Agriculture Programme may provide opportunities to deliver relevant elements within the AS. These will be considered during ongoing policy development. Farm support measures within the Sustainable Agriculture Programme may provide grant aid for ammonia mitigation measures, which may be recommended during assessment of potential OP air quality impacts. This will be considered during ongoing policy development.
The draft Clean Air Strategy for Northern Ireland	In development	Achievement of reductions in total ammonia emissions from agriculture in NI via the AS will support reductions in levels of Particulate Matter (PM) formed

		from ammonia. The OP will support reductions in levels of pollution by Particulate Matter (PM) through requiring reduced ammonia emissions from plans and projects.
North Atlantic Salmon Conservation Organisation (NASCO), Convention for the Conservation of Salmon in the North Atlantic Implementation Plan 2019-2024	Objectives are to contribute to the conservation, restoration, enhancement and rational management of salmon stocks, using the best scientific evidence available.	The AS and OP will contribute by reducing levels of ammonia and nitrogen deposition.
The Fisheries Act (NI) 1966 (as amended)	The monitoring of water quality and fish stocks.	The AS and OP will contribute by reducing levels of ammonia and nitrogen deposition.
The Nitrogen Futures Report	Development of spatial datasets, scenarios, testing of mitigation scenarios, analysis of co-benefits and trade-offs.	The report was taken into consideration in the development of mitigation measures in the AS.
The Scottish Nitrogen Balance Sheet (SNBS)	The SNBS provides a new source of evidence to track how efficiently nitrogen is used in Scotland and help identify further opportunities to improve this. It will help support progress towards Scotland's national climate change targets.	The SNBS report was taken into consideration in the development of the AS.
Nitrogen Impacts in Natural Ecosystems (NINE)	The project aims to provide evidence on the interactive effects on nitrogen and climate on biodiversity and functioning in Scottish ecosystems, to develop indicators of these impacts for use in environmental monitoring, and to explore the potential for mitigation of impacts and appropriate methods to apply.	The Nitrogen Mitigation report was taken into consideration in relation to monitoring of the impact of the AS and OP.
Ireland's 5th Nitrates Action Programme 2022-2025	Measures to protect waters, including drinking water sources, against pollution caused by nitrogen and phosphorus from agricultural sources, with the primary emphasis on the management	Measures in the programme were taken into account in development of the AS.

	of livestock manures and other fertilisers.	
Lough Neagh Report and Action Plan	A clear policy framework and associated route map to improving the environmental status of Lough Neagh, its wider ecosystem and waterbodies across Northern Ireland and improving water quality over the longer term.	The AS and OP will contribute by reducing levels of ammonia and nitrogen deposition.

(f) The likely significant effects[1] on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors.

Likely Significant Effects on the Environment

Section 6.1 sets out the detailed matrix assessment of the Proposed Ammonia Strategy and Revised Operational Protocol, the likely significant effects are summarised below, with a key showing the degree of beneficial or adverse effect.

Table 3. Key for Likely Significant Effects

++	Likely strong beneficial effect
+	Likely beneficial effect
0	Neutral / no effect
-	Likely adverse effect
- -	Likely strong adverse effect
+/-	Uncertain effect

[1] These effects should include secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative effects.

Table 4. SEA Themes

	Proposed Ammonia Strategy – proposed mandatory measures	Proposed Ammonia Strategy – voluntary measures	Revised Operational Protocol
SEA Theme	**Rating**	**Rating**	**Rating**
SEA Theme 1 - Biodiversity, fauna and flora	**++**	**++**	**++**
SEA Theme 2 - Population and human health	**++**	**++**	**++**
SEA Theme 3 – Water	**+**	**+**	**+**
SEA Theme 4 – Soil	**+**	**+**	**+**
SEA Theme 5 - Air	**++**	**++**	**++**
SEA Theme 6 - Climatic factors	**0**	**0**	**0**
SEA Theme 7 - Material Assets	**++**	**++**	**++**
SEA Theme 8 – Landscape	**++**	**++**	**++**
SEA Theme 9 - Cultural heritage including architectural and archaeological heritage	**+**	**+**	**+**

The grid above shows a clear pattern of likely strong beneficial or likely beneficial effects across eight of the nine SEA themes. No adverse effects were identified for any of the SEA Themes. The only theme which was assessed as having neutral or no effects was SEA Theme 6 – Climatic factors.

(g) The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme.

Measures to prevent, reduce and offset significant adverse effects of implementation

No significant adverse effects were identified as a result of implementing the Proposed Ammonia Strategy and Revised Operational Protocol thus no measures are applicable.

(h) An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.

Reasons for selecting the alternatives and how assessment was undertaken

From a strategic perspective, two alternative scenarios were considered for the Proposed Ammonia Strategy and Revised Operational Protocol:

Alternative 1: The Do-Nothing Approach or continuation of the existing policies for ammonia and the published Operational Protocol (to December 2023) for Northern Ireland, set out in Section 3.A and Section 3.B respectively.

Alternative 2: Implementation of the Proposed Ammonia Strategy and Revised Operational Protocol.

A High-Level Matrix Analysis of Alternative 1 and 2 against SEOs for each SEA Theme was carried out.

The chosen alternative is Alternative 2: Implementation of the Proposed Ammonia Strategy and Revised Operational Protocol. This alternative, from the assessment carried out, provides both likely strong beneficial effects or likely beneficial effects on a long-term basis across all of the Strategic Environmental Objectives, and avoids the potential cumulative, secondary and synergistic effects set out at 5.4.2.

(i) A description of the measures envisaged concerning monitoring in accordance with Article 10.

Monitoring measures

Section 8 details the four monitoring indicators to be used:

Monitoring Indicator 1 - Total ammonia emissions in Northern Ireland.

The Air Pollutant Inventories for England, Scotland, Wales and Northern Ireland provide annual estimates of air pollution emissions for eight priority pollutants including ammonia. Data from the most recent 2005 to 2022 report are provided at Section 8.1.

Monitoring Indicator 2 - The current status of habitats in Northern Ireland

The Northern Ireland Environmental Statistics Report provides an annual report of the condition of features within terrestrial protected sites by type of feature.

Monitoring Indicator 3 - Atmospheric ammonia monitoring in Northern Ireland

There are 28 Northern Ireland monitoring sites in the National Atmospheric Monitoring Network (NAMN). Data from these monitors feeds into an annual report and shows the spatial patterns of annual ammonia concentrations from the monthly measurements.

Monitoring Indicator 4 – Uptake of on-farm mitigation measures

DAERA will continue to use the Annual Census of farms to collect strategic data to improve the granularity of the National Atmospheric Emissions Inventory for Northern Ireland agriculture. DAERA will also liaise with industry stakeholders to develop opportunities for further data collection in specific sectors.

Statement on the difference the process has made to date.

Application of the process of Strategic Environmental Assessment has led from an initial separate screening of the Draft Ammonia Strategy through revised screening and scoping with the inclusion of the Revised Operational Protocol. This has led to a more pragmatic and holistic approach to SEA as the interrelationships between the Strategy and Protocol are captured in a much more effective and efficient manner than if each had been considered separately.

1. Introduction

1.1 Purpose of the Report

This Strategic Environmental Assessment (SEA) Environmental Report has been prepared by the DAERA/NIEA Ammonia Strategy and Operational Protocol Workgroup for the combined Proposed Ammonia Strategy and Revised Operational Protocol for Northern Ireland. When published in final form the Ammonia Strategy will be a new strategy for Northern Ireland, and the Operational Protocol will replace the interim approach used by NIEA since 19 December 2023[2].

SEA is a systematic process for evaluating the environmental consequences of proposed plans or programmes to ensure environmental issues are fully integrated and addressed at the earliest appropriate stage of decision making, to promote sustainable development.

The Strategic Environmental Assessment process was introduced under European Directive 2001/42/EC12 on the assessment of the effects of certain plans and programmes on the environment. The SEA Directive requirements were transposed into Northern Irish domestic law through the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 (SR 280/2004), hereafter referred to as 'the Northern Ireland Regulations'.

The Northern Ireland Regulations require the Department to assess the likely significant effects of its plans and programmes on: "the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship of the above factors" including "secondary, cumulative, synergistic, short, medium, and long-term, permanent and temporary positive and negative effects".

The purpose of this report is to evaluate the likely environmental effects of implementation and non-implementation of the Proposed Ammonia strategy and Revised Operational Protocol as per the requirements of the Directive and Northern Ireland Regulations. This includes an assessment of realistic strategic alternative approaches and options, as well as the suggestion of

[2] https://www.daera-ni.gov.uk/news/daera-statement-ammonia-standing-advice

mitigation and enhancement measures to prevent, reduce and offset any significant adverse effects on the environment of implementing the Proposed Strategy and Revised Protocol. A non-technical summary of the information provided in this report has been provided separately.

1.2 Structure of the Report

The areas considered in this Environmental Report, and their location in the report, are set out in Table 5.

Table 5. Structure of the report.

Environmental Report Component	Section
Approach to the SEA	Section 2.2
SEA Objectives and assessment methodology	Section 2.3 and 2.5
Summary of the Proposed Ammonia Strategy and Revised Operational Protocol	Section 3.A and 3.B
Summary of scoping consultation responses	Section 2.2.2 and Appendix C
Summary of baseline data and environmental issues	Section 4
Likely evolution of the environment without the Policy Change	Section 5.4
Consideration of alternatives	Section 5
Identification and assessment of likely significant effects	Section 6
Mitigation and enhancement measures	Section 7
Proposed monitoring programme	Section 8
Next steps regarding the consultation	Section 9
Relationship with other plans, programmes and conservation objectives	Appendix A

2. SEA Process and Assessment Methodology

2.1 Best Practice Guidance

The SEA approach takes into account procedures and information provided in the following guidance documents and legislation:

- A Practical Guide to the Strategic Environmental Assessment Directive Practical guidance on applying European Directive 2001/42/EC "on the assessment of the effects of certain plans and programmes on the environment". September 2005 - Scottish Executive; Welsh Assembly Government; Department of the Environment, Northern Ireland; Office of the Deputy Prime Minister: London.
- DAERA Guidance on Strategic Environmental Assessment[3]
- The Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004[4]
- Strategic Environmental Assessment Handbook. Scottish Enterprise Grampian, Aberdeenshire Council, Aberdeen City Council[5].

2.2 The SEA Process

Under The Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004, where an environmental assessment is required, responsible authorities are required to prepare an environmental report according to specific criteria:

- The report shall identify, describe and evaluate the likely significant effects on the environment of –
    - implementing the plan or programme; and
    - reasonable alternatives taking into account the objectives and geographical scope of the plan or programme.
- The report shall include such of the information referred to in Schedule 2 that may reasonably be required, taking account of –
    - current knowledge and methods of assessment.

[3] https://www.daera-ni.gov.uk/topics/land-and-landscapes/strategic-environmental-assessment
[4] https://www.legislation.gov.uk/nisr/2004/280/contents/made
[5] https://www.aberdeencity.gov.uk/sites/default/files/General_handbook.pdf

- the contents and level of detail in the plan or programme.
- the stage of the plan or programme in the decision-making process; and
- the extent to which certain matters are more appropriately assessed at different levels in that process in order to avoid duplication of the assessment.

The criteria above are incorporated into the SEA process and a summary description is provided in Table 6 along with an overview of the process presented in Figure 2.

Table 6. Summary Description of the Main Stages in SEA Process[6]

Stage	Description/ Key Tasks	Status
Screening	Responsible Authorities must carry out screening to determine whether plans or programmes of the types covered by Article 3(3) and 3(4) of the SEA Directive are likely to have significant environmental effects, and hence whether SEA is required under the Directive.	Final Screening Completed July 2024
Stage A: Scoping	**1.** Identification of other relevant plans, programmes and environmental protection objectives. **2.** Collection of baseline information. **3.** Identification of the key environmental problems and issues in the area to which the Proposed Ammonia Strategy and Revised Operational Protocol relate. **4.** Development of the SEA framework and objectives. **5.** Consultation with Statutory Consultees on the scope of the SEA.	Completed July 2024
Stage B: Developing and refining alternatives and assessing effects	1. Identification of reasonable alternative development strategies for the area which are capable of fulfilling the policy objectives established above. 2. Evaluation of alternative strategies against the chosen objectives to determine the most sustainable option.	July to Nov 2024

[6] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/bm-sea-practicalguide.pdf

	3. Selection of the preferred strategy (which may combine elements of different strategies), stating reasons for the decision, develop into detailed objectives. 4. Carry out environmental assessment of the preferred strategy to determine whether implementation would be likely to cause any significant effects on the environment (in particular, the aspects listed in Annex I of the SEA Directive, such as biodiversity, air, cultural heritage, etc.).	
Stage C: Preparing the Environmental Report	1. Modify the preferred strategy to eliminate, reduce or offset any significant adverse effects, as appropriate. 2. Propose monitoring measures in relation to any likely significant environmental impacts. 3. Prepare a non-technical summary.	July to Dec 2024
Stage D: Consult on the Environmental Report	1. Consult the public and Consultation Bodies on the Environmental Report. 2. Assess significant changes. 3. Make decisions and provide information.	Feb to April 2025
Stage E: SEA Statement	1. Adoption of Plan 2. Publication of SEA Statement	Anticipated Q2 2025
Stage E: Monitoring effects of implementing the plan or programme on the environment	1. Develop aims and methods for monitoring. 2. Respond to adverse effects.	2025 onwards

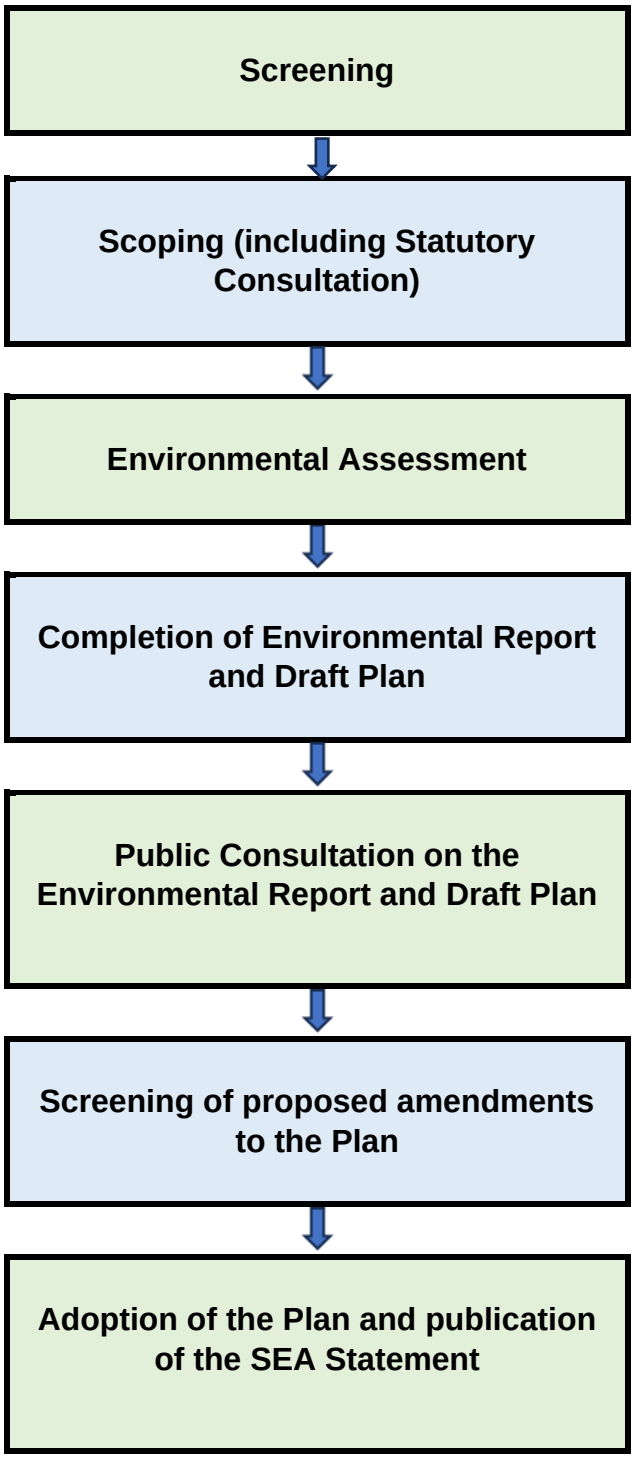


Figure 2. An overview of the SEA Process

2.2.1 Screening for SEA

The SEA Screening process was initially completed for the Draft Ammonia Strategy on a standalone basis in 2021 (Appendix A), and then repeated in January 2024 following significant changes to the Draft Ammonia Strategy. A further SEA Screening process was completed in July

2024 following the decision being made to combine the SEA process for the Proposed Ammonia Strategy and Revised Operational Protocol, in recognition of their linkages.

At each of the SEA Screening stages it was confirmed by the DAERA SEA team that an SEA would be required initially for the stand-alone Draft Ammonia Strategy, and latterly the combined Proposed Ammonia Strategy and Revised Operational Protocol. The most recent DAERA SEA team response on 7 July 2024 in Appendix A states that they are content with the conclusions of the screening report and agree that a full SEA is required for the combined Proposed Ammonia Strategy and Revised Operational Protocol. The DAERA SEA response on 7 July 2024 also stated that where there is the potential for transboundary impacts they must be considered in the Environmental Report (ER) and transboundary consultation with the relevant bodies should be carried out at each stage.

2.2.2 Scoping for SEA

A Combined SEA Scoping Report for the Proposed Ammonia Strategy and Revised Operational Protocol was produced by the Ammonia Strategy and Operational Protocol SEA Working Group. The purpose of the Scoping Report was to provide sufficient information on the Proposed Ammonia Strategy and Revised Operational Protocol to enable the statutory consultees to form an opinion on the appropriateness of the scope, format, level of detail, methodology for assessment and the consultation period proposed for the Environmental Reports.

A five-week consultation on the Scoping Report was carried out from 11 June to 18 July 2024 with statutory consultees shown in Figure 3. Consultation responses are provided at Annex B in full, and were received from:

- Department for Communities, Historic Environment Division.
- Department of Agriculture, Environment and Rural Affairs, DAERA - NIEA SEA Team.
- Department of Agriculture, Environment and Rural Affairs, Marine Conservation Branch.
- Department of Agriculture, Environment and Rural Affairs, Marine Plan Team.
- Nature Scot.
- Scottish Environmental Protection Agency.

Responses provided by the statutory consultees to the Scoping Report are set out alongside the relevant SEA Theme in Table 7 along with details of the action that was taken as a result of the response.

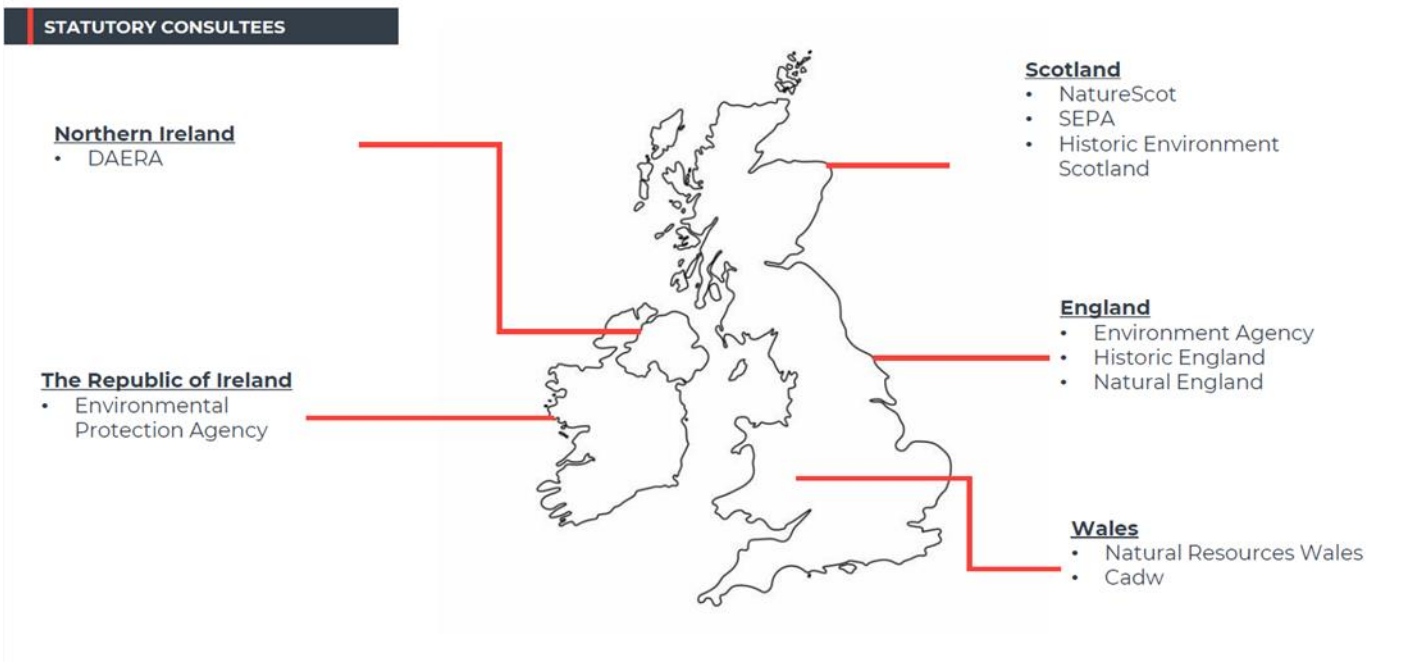


Figure 3. Statutory Consultees in the Scoping Process.

Table 7. SEA Scoping Report Responses Summary and Action Taken.

SEA Theme	SEA Scoping Report responses	Action taken
Biodiversity, fauna and flora	For this theme and the water and soil theme – the objective is to reduce biodiversity loss however no measures of biodiversity are proposed as indicators; suggest that vegetation quadrat surveys are conducted at the monitoring sites with analysis of measures of biodiversity (including species richness, evenness, positive and negative indicator species) to provide further evidence of whether this objective has been met. Recommend monitoring the impacts of reduced emissions on flora, soil, water, biodiversity – don't just concentrate on the pressures.	The Northern Ireland Environmental Statistics Report status of habitats will be used to gauge impact on biodiversity.
Water and soil	The marine environment to be taken account of as well as terrestrial and inland aquatic environments (refs[7], [8]) SEA should not be confined to designated sites, potential impacts on priority species and habitats should be included.	Detailed under SEA Theme 4.

[7] https://www.gov.uk/government/publications/uk-marine-policy-statement
[8] https://www.daera-ni.gov.uk/articles/marine-plan-northern-ireland
*North Atlantic Salmon Conservation Organisation (NASCO), Convention for the Conservation of Salmon in the North Atlantic Implementation Plan 2019-2024, and The Fisheries Act (NI) 1966 (as amended).

	The SEA should be cognisant of other Relevant Plans and Programmes*. Should directly address water pollution from agricultural ammonia – water chemistry, ecological effects and blue-green algae should be included in the indicators. Ireland's 5th Nitrates Action Programme 2022-2025 is designed to prevent pollution of surface waters and groundwaters from agricultural sources as well as to protect and improve water quality.	
Air	There should be a consideration of monitoring and modelling the impacts on transboundary PM from NI to the rest of the UK.	See Section 4.4.5.8.
Climatic factors	The CCC UK Climate Risk Independent Assessment 2021 NI Summary should be considered[9]. To evaluate impact on the carbon storage ecosystem function add an objective to improve sphagnum cover and hydrology at peatland bog sites to reduce carbon losses and retain stored carbon, supported by an indicator of sphagnum areal coverage and water table depth at the monitoring sites. Vegetation tissue N analysis would also be welcome to better understand where ammonia concentration and deposition do not track together.	The UK Climate Change Risk Assessment (CCRA3) 2022 is set out at section 4.4.6.5
Cultural heritage and landscape	Landscape and Cultural Heritage need to be separated in the Environmental Report. For the purposes of assessment the inter-relationship of the historic environment with other topics such as landscape, water and biodiversity, and the natural environment are highlighted.	Landscape and cultural heritage are treated as separate SEA Themes.

2.2.2.1 Review of Relevant Plans, Programmes and Policies

Assessing the relationship of the Proposed Ammonia Strategy and Revised Operational Protocol with the existing International, European and National framework of plans, programmes and policies, and identifying gaps and conflicts is a key part of the SEA process. This includes the consideration of statutory and non-statutory environmental protection objectives.

The scoping process involved an initial review of plans, programmes and policies. Additional plans and programmes have been added to the revised list shown in Table 8 as recommended in

[9] https://www.ukclimaterisk.org/publications/summary-for-northern-ireland-ccra3-ia/#section-1-about-this-document

responses provided to the scoping report, along with an assessment of the inter-relationship and possible cumulative effects with the Policy. Appendix A considers the relationship between the Proposed Ammonia Strategy, the Revised Operational Protocol, and relevant plans and programmes. It also considers the environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme.

Table 8. Relevant Plans, Programmes and Policies Reviewed in Appendix A.

International Level	
4.1.1	The Convention on Wetlands – The Ramsar Convention
4.1.2	Bern Convention (Convention on European Wildlife and Natural Habitats) (1982)
4.1.3	UN Convention on Biological Diversity (1992)
UK level	
4.1.4	National Emission Reduction Commitments Directive (NEC) Directive (2016/2284/EU)
National Level	
4.1.5	The Conservation (Natural Habitats, etc.) Regulations 1995 (Northern Ireland) ('Habitats Regulations')
4.1.6	The Environment (Northern Ireland) Order (2002)20
4.1.7	The PPC (IE) Regulations (NI) 2013
4.1.8	The Wildlife and Natural Environment Act NI (2011)
4.1.9	The Air Quality Standards Regulations (Northern Ireland) 2010
4.1.10	The DAERA Plan to 2050 - Sustainability for the Future
4.1.11	The draft Green Growth Strategy for Northern Ireland
4.1.12	The Environmental Improvement Plan for Northern Ireland
4.1.13	The draft Nature Recovery Strategy
4.1.14	The Nutrients Action Programme (NAP)
4.1.15	Sustainable Agriculture Programme
4.1.16	The draft Clean Air Strategy for Northern Ireland
4.1.17	North Atlantic Salmon Conservation Organisation (NASCO), Convention for the Conservation of Salmon in the North Atlantic Implementation Plan 2019-2024
4.1.18	The Fisheries Act (NI) 1966 (as amended)
4.1.19	The Nitrogen Futures Report
4.1.20	The Scottish Nitrogen Balance Sheet
4.1.21	Nitrogen Impacts in Natural Ecosystems (NINE)
4.1.22	Ireland's 5th Nitrates Action Programme 2022-2025

4.1.23	Lough Neagh Report and Action Plan

2.3 SEA Topics, Themes and Objectives

2.3.1 SEA Topics

The baseline data, key environmental issues and SEA Objectives are derived from Schedule 2 Information for Environmental Reports[10]. This specifies consideration of likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects, on issues shown in Figure 4 and the inter-relationships between them.

Biodiversity	**Population**	**Human health**	**Fauna**
Flora	**Soil**	**Water**	**Air**
Climatic factors	**Material assets**	**Cultural heritage***	**Landscape**

*Including architectural and archaeological heritage

Figure 4. SEA Topics to be considered in the Environmental Report.

2.3.2 SEA Themes

The topics listed in Figure 4 are typically grouped into intuitive themes to aid pragmatic consideration during the SEA process. The themes used in the SEA Scoping Report were:

- Biodiversity, fauna and flora.
- Population and human health.
- Water and soil.
- Air.
- Climatic factors.
- Cultural heritage including architectural and archaeological heritage, and landscape.

[10] https://www.legislation.gov.uk/nisr/2004/280/schedule/2/made

Following consideration of feedback received on the Scoping Report detailed in Table 8 the themes have been split into additional categories for focussed consideration. Given the significance of the water and soil topics in terms of potential environmental impacts they have also been separated. This gives a total of nine themes to be considered, set out and numbered in Table 9.

Table 9. SEA Themes to be considered in the Environmental Report

Theme 1 - Biodiversity, fauna and flora
Theme 2 - Population and human health
Theme 3 - Water
Theme 4 - Soil
Theme 5 - Air
Theme 6 - Climatic factors
Theme 7 - Material Assets
Theme 8 - Landscape
Theme 9 - Cultural heritage including architectural and archaeological heritage

2.3.3 SEA Objectives

The SEA themes are used to develop SEA Objectives whose purpose is to ensure that the assessment process is transparent and robust, and that potential environmental effects are considered and addressed. The SEA Objectives from the Scoping Report are set out alongside the SEA Themes used in the Scoping Report in Table 10.

Table 10. SEA Objectives from the Scoping Report.

SEA Theme	SEA Objectives from Scoping Report
Theme 1 - Biodiversity, fauna and flora	Reduce negative impacts from ammonia and nitrogen deposition on biodiversity, flora and fauna at designated sites to reduce biodiversity loss.
Theme 2 - Population and human health	Reduced total ammonia emissions leading to less creation of particulate matter, $PM_{2.5}$, formed from ammonia.
Themes 3 & 4 - Water and soil	Contribute to maintenance and restoration of hydrology at designated sites by reducing biodiversity loss caused by ammonia and nitrogen deposition.
Theme 5 - Air	Reduce the number of designated sites exceeding their Critical Loads and Levels. Reduce potential for $PM_{2.5}$ production from ammonia by reducing ammonia emissions from agriculture.
Theme 6 - Climatic factors	Reduce vulnerability to the effects of climate change e.g. flooding, by contributing to maintenance and restoration of hydrology at designated sites by reducing biodiversity loss caused by ammonia and nitrogen deposition. Maintain and improve the health of peatlands, which are valuable carbon sinks.
Themes 8 & 9 - Cultural heritage including architectural and archaeological heritage and landscape	Contribute to protection and enhancement of the landscape in designated areas by reducing damage caused by ammonia emissions and nitrogen deposition.

Following additional consideration of The Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004[11], the SEA Objectives were reviewed in the context of broader environmental protection objectives at both international and national level (outlined in Appendix A) relevant to the Proposed Ammonia Strategy and Revised Operational Protocol. The review of relevant environmental objectives can be used to construct a framework of objectives against which a plan can be assessed. This can identify whether a plan supports wider environmental objectives or whether there are any environmental gaps[12].

Definition of Objectives and Indicators in Strategic Environmental Assessment:

Objective: An intended goal, specifying the desired direction and outcome.

Indicator: Normally associated with monitoring, is used to measure achievement of a

[11] https://www.legislation.gov.uk/nisr/2004/280/schedule/2/made

[12] https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2013/08/strategic-environmental-assessment-guidance/documents/00432344-pdf/00432344-pdf/govscot%3Adocument/00432344.pdf

plan’s main objectives or can be deployed to gauge environmental effects over time.

Tables 11 sets out the revised SEA Objectives, Sub-objectives, Indicators and Targets.

Table 11. Strategic Environmental Objectives, Indicators and Targets (SR= Scoping Report, EIP = Environmental Improvement Plan, Stat = Statutory, Non-Stat = non-statutory)

SEA Theme 1 - Biodiversity, fauna and flora		
Strategic Environmental Objectives (SEOs)	**Indicators**	**Targets**
(SR) Reduce negative impacts from ammonia and nitrogen deposition on biodiversity, flora and fauna at designated sites to reduce biodiversity loss. Put NI agriculture on a pathway to meet the UK National Emissions Ceiling Regulations 2030 target for ammonia reductions. For European site features - agree to plan or project after having ascertained that it will not adversely affect their integrity (SACs, SPAs, Ramsars). For ASSIs take decisions within the framework of whether a proposal is 'likely to damage'. (EIP) Consider and integrate biodiversity values into all decision-making processes at all levels. (EIP) By 2030: At least 30% of land and freshwater protected, connected and managed for nature.	The National Atmospheric Emissions Inventory (NAEI). National Ammonia Monitoring Network (NAMN) from 2026-30. Ammonia Modelling Research. Trends Report 2022: Trends in critical load and critical level exceedances in the UK[13] Site Condition Assessment via Common Standards Monitoring.	Reduce total ammonia emissions from agriculture to 24 kt by 2030. Reducing levels of ammonia at NAMN designated sites from 2026-30. Reducing modelled levels of ammonia at all designated sites. Reduced number of sites with exceedance of Critical Load or Levels for sensitive features. Increased number of European Sites in Favourable Condition.

[13] Hina, Naila. (2022). Trends Report 2022: Trends in critical load and critical level exceedances in the UK.

SEA Theme 2 - Population and human health		
Strategic Environmental Objectives (SEOs)	**Indicators**	**Targets**
(SR) Reduced total ammonia emissions leading to less creation of particulate matter, $PM_{2.5}$. (EIP) Healthy & accessible environment & landscapes everyone can connect with & enjoy.	National Atmospheric Emissions Inventory	A 16% reduction in total NI agricultural ammonia emissions by 2030, (from 2005 levels) in the National Atmospheric Inventory. Reducing modelled levels of ammonia at all designated sites. Reducing monitored (where available) and modelled levels of N deposition at designated sites from 2026-30. Reducing the proportion of sites that show exceedance of critical load or levels for sensitive features.

SEA Theme 3 – Water		
Strategic Environmental Objectives (SEOs)	**Indicators**	**Targets**
(SR) Contribute to maintenance and restoration of hydrology at designated sites by reducing biodiversity loss caused by ammonia and nitrogen deposition. (EIP) By 2030, to have protected our Bathing Waters and Sensitive Areas including Shellfish Water Protected Areas from storm sewage discharges and reduce impacts of agriculture on such areas.	National Ammonia Monitoring Network.	Reducing modelled levels of ammonia at all designated sites. Reducing monitored (where available) and modelled levels of N deposition at designated sites from 2026-30. Reducing the proportion of sites that show exceedance of critical load or levels for sensitive features.
Improvement in status of water bodies under the UK Water Framework Regulation water quality indicators.	Ecological Status for surface water and Chemical Status for groundwater.	By 2027: 100% of waterbodies at Good Ecological Status (surface water) & Good Chemical Status (groundwater).

SEA Theme 4 – Soil		
Strategic Environmental Objectives (SEOs)	**Indicators**	**Targets**
(SR) Contribute to maintenance and restoration of hydrology at designated sites by reducing biodiversity loss caused by ammonia and nitrogen deposition.	National Ammonia Monitoring Network	Reducing modelled levels of ammonia at all designated sites. Reducing monitored (where available) and modelled levels of N deposition at designated sites from 2026-30. Reducing the proportion of sites that show exceedance of critical load or levels for sensitive features.

SEA Theme 5 - Air		
Strategic Environmental Objectives (SEOs)	**Indicators**	**Targets**
(SR) Reduce the number of designated sites exceeding their Critical Loads and Levels.	National Ammonia Monitoring Network	Reducing modelled levels of ammonia at all designated sites.
(SR) Reduce potential for $PM_{2.5}$ production by reducing ammonia emissions from agriculture.	Trends Report	Reducing monitored (where available) and modelled levels of N deposition at designated sites from 2026-30. Reducing the proportion of sites that show exceedance of critical load or levels for sensitive features.
Improved local air quality.	Air quality monitoring stations	Improved air quality.

SEA Theme 6 - Climatic factors		
Strategic Environmental Objectives (SEOs)	**Indicators**	**Targets**
(SR) Reduce vulnerability to the effects of climate change e.g. flooding, by contributing to maintenance and restoration of hydrology at designated sites by reducing biodiversity loss caused by ammonia and nitrogen deposition. (EIP) Net zero Northern Ireland greenhouse gas emissions by 2050.	National Ammonia Monitoring Network	Reducing modelled levels of ammonia at all designated sites. Reducing monitored (where available) and modelled levels of N deposition at designated sites from 2026-30. Reducing the proportion of sites that show exceedance of critical load or levels for sensitive features.

SEA Theme 7 - Material Assets		
Strategic Environmental Objectives (SEOs)	**Indicators**	**Targets**
(EIP) Sustainable management and efficient use of natural resources including water & soils. (EIP) Introduce Phosphorus and Nitrogen Balance targets for the NI agricultural sector.	Provide soil sampling, analysis, run off risk maps and nutrient management training for farmers throughout NI who are participating in the Soil Nutrient Health Scheme.	By end of 2027.
(EIP) Improve quantity, quality & accessibility of existing natural spaces, parks, recreational routes and marine & freshwaters.	Reduce the amount of phosphorus applied in chemical fertilisers by 50% on 2023 levels, through improved nutrient management on farms and recycling of organic nutrients.	By end of 2028.
(EIP) Enhance our evidence on the extent, condition, functioning and connectivity of NI ecosystems, using a range of earth observation, survey methodologies and land cover assessments.	Levels recorded via the National Ammonia Monitoring Network	Reducing modelled levels of ammonia at all designated sites.
(EIP) An industry that is environmentally responsible, efficient, adaptable, responsive and resilient in times of crisis and uses knowledge and evidence as primary tools to deliver sustained success.	Instrumented Landscape	Reducing monitored (where available) and modelled levels of N deposition at designated sites from 2026-30. Reducing the proportion of sites that show exceedance of critical load or levels for sensitive features.

SEA Theme 8 – Landscape		
Strategic Environmental Objectives (SEOs)	**Indicators**	**Targets**
(SR) Contribute to protection and enhancement of the landscape in designated areas by reducing damage caused by ammonia emissions and nitrogen deposition. (EIP) All semi-natural peatlands are conserved or restored to healthy, functioning ecosystems by 2040.	The National Atmospheric Emissions Inventory. National Ammonia Monitoring Network (NAMN) from 2026-30. Ammonia Modelling Research. Trends Report 2022: Trends in critical load and critical level exceedances in the UK. Site Condition Assessment via Common Standards Monitoring.	Reduce total ammonia emissions from agriculture to 24 kt by 2030. Reducing levels of ammonia at NAMN designated sites from 2026-30. Reducing modelled levels of ammonia at all designated sites. Reduced number of sites with exceedance of Critical Load or Levels for sensitive features. Increased number of European Sites in Favourable Condition.

SEA Theme 9 - Cultural heritage including architectural and archaeological heritage		
Strategic Environmental Objectives (SEOs)	**Indicators**	**Target**
(SR) Contribute to protection and enhancement of the landscape in designated areas by reducing damage caused by ammonia emissions and nitrogen deposition. (EIP) Integrate marine and aquatic historic environment considerations into all decision-making processes and assessments of environmental impacts.	The National Atmospheric Emissions Inventory. National Ammonia Monitoring Network (NAMN) from 2026-30. Ammonia Modelling Research. Trends Report 2022: Trends in critical load and critical level exceedances in the UK. Site Condition Assessment via Common Standards Monitoring.	Reduce total ammonia emissions from agriculture to 24 kt by 2030. Reducing levels of ammonia at NAMN designated sites from 2026-30. Reducing modelled levels of ammonia at all designated sites. Reduced number of sites with exceedance of Critical Load or Levels for sensitive features. Increased number of European Sites in Favourable Condition.

2.4 Spatial and Temporal Scope

2.4.1 Spatial Scope

The Proposed Ammonia Strategy and Revised Operational Protocol are national level programmes in Northern Ireland. As such, the assessment will primarily focus on activities occurring at a national to regional scale, while having careful regard to any likely significant environmental effects of a transboundary nature to receptors in the Republic of Ireland and Scotland.

2.4.2 Temporal Scope

The Proposed Ammonia Strategy covers the period from 2025 to 2030. A review point will be incorporated into the Proposed Ammonia Strategy in 2026 to facilitate a stocktake and review of the mandatory and voluntary measures and the progress made in reducing agricultural ammonia emissions.

It must be noted that with environmental parameters such as biodiversity, flora and fauna, soil and landscape, any positive or negative impacts associated with the Proposed Ammonia Strategy and Revised Operational Protocol may take effect over variable time periods.

The SEA of the Proposed Ammonia Strategy will consider the potential for short, medium, and long-term impacts from implementing policy proposals (including reference to secondary, cumulative, synergistic, permanent and temporary, positive and negative effects), in line with the requirements of the SEA Directive.

The Revised Operational Protocol will operate from now going forward until additional scientific and/or legal evidence emerges; at which point a review will take place in light of the new evidence.

Feedback from the Scoping process noted concerns around the temporal scope and the need to monitor the impacts of measures. In relation to the 2026 Ammonia Strategy review the following questions were posed for consideration:

• What degree of reduction in agricultural ammonia emissions and designated sites' ammonia concentrations and nitrogen deposition rates would be considered significant?

• What is the range of potential effects?

• What scope will there be to strengthen measures if little effect is detected in the indicators by the Ammonia Strategy 2026 review point?

2.5 Assessment Methodology

This stage of the SEA process involves the identification and evaluation of the likely significant effects on the environment of implementing the Proposed Ammonia Strategy and the Revised Operational Protocol and their reasonable alternatives. A matrix approach has been followed and carried out in several stages to include high level and detailed matrix assessments, and a descriptive cumulative effects assessment.

As part of the overall impact assessment process Habitats Regulations Screening was carried out alongside Strategic Environmental Assessment screening for the combined Proposed Ammonia Strategy and the Revised Operational Protocol, and both were screened out for Habitats Regulations Assessment. The Habitats Regulations Screening Report is published alongside the SEA Environmental Report.

2.5.1 High Level Matrix Assessment

The high-level assessment first step of the process is used to identify the likely adverse, beneficial, neutral and uncertain effects of the Proposed Ammonia Strategy and Revised Operational Protocol on the environment. The assessment shows, through the application of the matrix process how well the Proposed Ammonia Strategy and the Revised Operational Protocol meet each of the SEA Objectives. A descriptive summary of the likely effects is provided alongside the matrix.

The high-level matrix assessment is not a conclusive tool or model; its purpose is to identify those principles or policies for which uncertainties or potential adverse effects may arise. These particular principles or policies would then typically undergo further scrutiny e.g. via the detailed matrix assessment stage. Going forwards, these known types of impacts will be addressed directly through mitigation and/or enhancement measures.

A high-level matrix assessment was carried out on the alternative options including the 'do nothing' option, described in full at Section 5. This enables comparisons to be drawn between how the options meet the SEA Objectives. Table 12 shows the key used in the high-level matrix.

Table 12 Key for Likely Effects

++	Likely strong beneficial effect
+	Likely beneficial effect
0	Neutral / no effect
-	Likely adverse effect
- -	Likely strong adverse effect
+/-	Uncertain effect

In this assessment:

• Plus (+) indicates a potential beneficial environmental effect.

• Minus (-) indicates a potential adverse environmental effect.

• Plus/minus (+/-) will indicate that both beneficial and adverse environmental effects are likely or that, in the absence of further detail, the beneficial effects are unclear or uncertain.

2.5.2 Detailed Matrix Assessment

The second step of the assessment process is used to scrutinise the potential adverse or uncertain effects that have been identified by the high-level assessment. Each Policy Area/Theme identified as having potentially adverse or uncertain effects would then be analysed against each of the SEA Objectives in more detail.

In order to determine the likely significance of effects, this process addresses the range of criteria identified in Schedule 1 of The Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004[14] (reproduced below):

"Criteria for determining the likely significance of effects on the environment"

1. The characteristics of plans and programmes, having regard, in particular, to:

[14] https://www.legislation.gov.uk/nisr/2004/280/pdfs/nisr_20040280_en.pdf

(a) the degree to which the plan or programme sets a framework for projects and other activities, either with regard to the location, nature, size and operating conditions or by allocating resources.
(b) the degree to which the plan or programme influences other plans and programmes including those in a hierarchy.
(c) the relevance of the plan or programme for the integration of environmental considerations in particular with a view to promoting sustainable development.
(d) environmental problems relevant to the plan or programme; and
(e) the relevance of the plan or programme for the implementation of Community legislation on the environment (e.g. plans and programmes linked to waste management or water protection).

2. Characteristics of the effects and of the area likely to be affected, having regard, in particular, to:
(a) the probability, duration, frequency and reversibility of the effects.
(b) the cumulative nature of the effects.
(c) the transboundary nature of the effects.
(d) the risks to human health or the environment (e.g. due to accidents).
(e) the magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected).
(f) the value and vulnerability of the area likely to be affected due to –
    (i) special natural characteristics or cultural heritage.
    (ii) exceeded environmental quality standards or limit values; or
    (iii) intensive land-use; and
(g) the effects on areas or landscapes which have a recognised national, Community or international protection status."

2.6 Uncertainties, Difficulties and Data Gaps

The mandatory and voluntary measures in the Proposed Ammonia Strategy are at different stages of development. In relation to the mandatory measures, the specific details of the tiers to be used to move to 100% use of Low Emission Slurry Spreading Equipment by 2030 will be consulted on as part of the 2025 Nutrients Action Programme Review (NAP Review); and the move to a ban on the use of urea fertiliser without a urease inhibitor will also be consulted on as part of the NAP Review.

In respect of the voluntary measures in the Proposed Ammonia Strategy, further research is being undertaken to evaluate the target uptake rates required to deliver the 2030 target of a 25% reduction in total agricultural ammonia emissions (using a 2021 baseline, equivalent to the NECR 2018 target to 2030). This research will update the 2019 Marginal Abatement Cost Curve data in respect of the level of industry uptake required to deliver the emission reduction target. While it is not likely that there will be a significant magnitude of variation between the existing MACC curve uptake rates and the updated uptake rates there will be a potential impact on the assessment.

The specific factors in the Revised Operational Protocol reflect the best available science and evidence following the Call for Evidence; if additional appropriate science and evidence become available it will be taken into consideration.

The Revised Operational Protocol has a greater level of detail in its assessment methods than the detail available for the measures in the Proposed Ammonia Strategy, however this must be offset against the need to predict the number of future projects and their scale, to be considered under the Revised Operational Protocol. All of the factors described above make it difficult to give an assessment that is level across both the Proposed Ammonia Strategy and the Revised Operational Protocol.

The Proposed Ammonia Strategy and Revised Operational Protocol will also operate at different scales. The Proposed Ammonia Strategy will apply over a large geographic scale, covering farms across Northern Ireland, with the specific degree of farm coverage determined by individual farm characteristics. Some farms may not be impacted at all by the Proposed Ammonia Strategy, whereas others will be impacted by various combinations of mandatory and voluntary measures.

The Revised Operational Protocol will operate at the specific farm and project level scale. The degree of impact of the protocol on the specific farm and project practices will be determined on an individual basis, while taking into account local development pressure and local site characteristics as part of the assessment process.

At a strategic level of assessment, there is some difficulty and uncertainty in assessing the implications of policy implementation at the local level. Some of the measures in the Proposed Ammonia Strategy are founded on existing policies already contained in the Nutrients Action Programme, which have been further developed to deliver more potential for environmental benefits, for example the proposed move to 100% use of Low Emission Slurry Spreading

Equipment. Other measures are new and based on emerging science and technologies. In the case of those policies that are based on new science or technologies, the potential effects of their implementation have been assessed on the basis of current understanding however there will be a level of uncertainty regarding the long-term effects of implementing these policies, which may require further research during policy development as well as monitoring to assess any potential implications.

These differences present some difficulties in the level at which the Proposed Ammonia Strategy and Revised Operational Protocol can be assessed; assessments have been made at a high level across the strategy and protocol. Where difficulties or uncertainties such as described above have been identified during assessment, recommendations and mitigation have been proposed.

2.7 Links to Appropriate Assessment

The Habitats Directive (Council Directive 92/43/EEC) on the conservation of natural habitats and of wild fauna and flora obliges Member States to designate, protect and conserve habitats and species of importance in a European Union context. Article 6(3) of the Habitats Directive requires that “Any plan or project not directly connected with or necessary to the conservation of a site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives.” The Directive was transposed into Northern Ireland legislation through the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995.

Any proposed plan or project that has potential to result in a likely significant effect on a designated European site will require an Appropriate Assessment (AA). Case law has determined that the likelihood need not be great, merely possible, and that the precautionary principle must apply as set out in European Commission Guidance and as required by CJEU case law (i.e. C 127/02 ‘Waddenzee’).

The Habitats Regulatory Assessment (HRA) Screening Report for the Proposed Ammonia Strategy and Revised Operational Protocol is included at Appendix A and concludes that further HRA assessment is not required i.e. the strategy and protocol are screened out for further assessment.

3. Current and Proposed Policy on Ammonia Emissions from Agriculture in Northern Ireland

3.1 Current Policy on Ammonia Emissions from Agriculture

Reductions in ammonia emissions from agriculture in Northern Ireland are currently delivered through the measures in the Nutrient Action Programme (NAP) 2019-2022 Regulations[15]. The NAP Regulations apply to all agriculture land in Northern Ireland. A review of the NAP regulations is currently underway and a public consultation on the NAP Review will be launched soon, details of the linkages between the NAP Review and the proposed mandatory measures in the Proposed Ammonia Strategy are set out in Section 3.1.2.5.

3.1.1 Summary of the Nutrients Action Programme (NAP) 2019-2022 Regulations Relevant to Ammonia Emissions

The NAP 2019-2022 Regulations relevant to ammonia emissions are:

- Closed Spreading Periods.
- Land Application Restrictions.
- Livestock Manure Nitrogen Limits.
- Overall Nitrogen (N) Fertiliser Limits
- Livestock Manure Storage Requirements

The specific NAP 2019-2022 measures being taken forward and further developed in the Proposed Ammonia Strategy are the use of Low Emission Slurry Spreading and the covering of above ground slurry stores. The NAP 2019-2022 measures applying to Low Emission Slurry Spreading (LESSE) require the use of LESSE:

- From 1 February 2020 for spreading anaerobic digestate.
- From 1 February 2021 by slurry contractors.
- From 1 February 2022 on cattle farms with 200 or more livestock units and pig farms with a total annual livestock manure nitrogen production of 20,000 kg or more from pigs.

[15] https://www.daera-ni.gov.uk/nutrientsactionprogramme2019-2022

- Where it is not practical to spread on a field using LESSE, slurry can be spread using an inverted splash plate on that field. A record of the field number and the reason for spreading using a splash plate must be kept for inspection.
- Low Emission Slurry Spreading Equipment (LESSE) includes bandspreading, dribble bar, trailing hose, trailing shoe, soil incorporation or soil injection methods.

The NAP 2019-2022 measures in respect of above ground slurry stores are:

- From 1 January 2020 new above ground slurry stores must be sited at least 50m from any waterway and fitted with a cover.

3.1.2 Policy on Ammonia Emissions from Agriculture in Northern Ireland – The Proposed Ammonia Strategy

The vision, objective and outcomes for the Proposed Ammonia Strategy are set out below. The Proposed Ammonia Strategy contains mandatory and voluntary measures to reduce ammonia emissions from agriculture in Northern Ireland. The measures are summarised below and set out in detail in the Update to the Proposed Ammonia Strategy which has been published alongside this report.

3.1.2.1 Vision of the Proposed Ammonia Strategy

The vision of the Proposed Ammonia Strategy is to deliver sustained reductions in ammonia to protect nature, meet Northern Ireland's legal obligations, and to ensure a sustainable agri-food sector.

3.1.2.2 Objective of the Proposed Ammonia Strategy

The objective of the Proposed Ammonia Strategy, as part of the Combined Approach to Ammonia, is:

- To put Northern Ireland agriculture on a pathway to meet the UK National Emissions Ceiling Regulations (NECR) 2018 target for reductions in ammonia emissions by 2030.

3.1.2.3 Outcomes of the Proposed Ammonia Strategy

The outcomes for the Proposed Ammonia Strategy following consultation, for ammonia emissions to 2030 and to 2050, are set out in Table 13, for ammonia emissions to 2030 and to 2050, revised

following consideration of stakeholder feedback to the consultation on the Draft Ammonia Strategy.

Table 13. Proposed Ammonia Strategy Outcomes to 2030 and 2050

2030 Target	To meet the UK's NECR ammonia emission reduction target to 2030.
2050 Target	Ammonia emissions reduced to a point where critical loads of nitrogen deposition and critical levels of ammonia are not being exceeded at any designated sites (from EIP[16]).

The National Emission Ceilings Regulations (NECR) 2018 set out the UK's national emission reduction commitment in 2030, which is a 16% reduction in ammonia compared to the base year of 2005. Using the most recent National Atmospheric Emissions Inventory (NAEI) data for 2022, a 16% reduction in the 2005 baseline ammonia emissions from agriculture means that the NI agricultural ammonia emissions target for 2030 is 24.17 kt. This 16% reduction, expressed in kilotonnes, and as a percentage of the most recent 2022 National Atmospheric Emissions Inventory (NAEI) data, is set out in Box 11.

Box 11. Proposed Ammonia Strategy 2030 Target for NI agricultural ammonia emission reductions

- A **16% reduction** in the 2005 baseline agricultural ammonia emissions of **28.77 kt**.
- Equates to agricultural ammonia emissions **reducing to 24.17 kt by 2030**.
- Equates to agricultural ammonia emissions **reducing by 6.69 kt reduction from 2022 levels**.
- Equates to agricultural ammonia emissions **reducing by 22% of 2022 levels**.

The Update on the Proposed Ammonia Strategy for Northern Ireland 2024-2030 sets out the proposed mandatory and voluntary measures that will be used to deliver reductions in ammonia

[16] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Environmental%20Improvement%20Plan%20for%20Northern%20Ireland.PDF

emissions to 2030 and sets out further opportunities for consultation on the mandatory measures as part of the 2025 Nutrients Action Programme Review. It also indicates how stakeholder feedback provided during the 2023 consultation on the Draft Ammonia Strategy has been taken into consideration.

3.1.2.5 Mandatory Measures in the Proposed Ammonia Strategy

There are two proposed mandatory measures in the Proposed Ammonia Strategy, each of which will be consulted on further as part of the Nutrients Action Programme Review:

- A proposed move to 100% Use of Low Emission Slurry Spreading Equipment (LESSE) by 2030, with Livestock Manure Nitrogen Production per hectare proposed as the metric to determine mandatory LESSE use, in place of Livestock Units or Livestock Nitrogen Loading per hectare.
- A proposed prohibition on the use of urea fertiliser without an inhibitor.

3.1.2.6 Voluntary Measures in the Proposed Ammonia Strategy

The series of seven voluntary measures included in the Proposed Ammonia Strategy are listed in Table 14. Other ammonia mitigation measures are available and new technologies for ammonia mitigation continue to be developed and refined. It is anticipated that the list will be reviewed and amended in future iterations of the Ammonia Strategy, to reflect the evolving scientific evidence base. Detail of each voluntary measure is set out in the Update on the Proposed Ammonia Strategy, published alongside this report.

Table 14. Voluntary Measures in the Proposed Ammonia Strategy.

1. Low Emission Livestock Housing
2. Emerging Technologies
3. Longer Grazing Seasons
4. Reducing Crude Protein in Livestock Diets
5. Improving Feed Efficiency Through Genetic Improvement
6. Establishing Tree Plantations around Livestock Housing

7. Covering Above Ground Slurry Stores.

3.2 Previous and Revised Operational Protocol to assess the Impacts of Air Pollution on the Natural Environment in Northern Ireland

3.2.1 The Previous Operational Protocol in Northern Ireland

A number of changes took place in the approach used by DAERA in relation to the Operational Protocol in 2023. The background and current situation is outlined below.

DAERA, in its role as the appropriate nature conservation body in Northern Ireland as set out in The Conservation of Habitats and Species Regulations 2017, Section 5, has a duty to provide advice to planning authorities and other competent authorities on the potential impacts of air pollution, including ammonia, from plans and projects on designated sites and protected habitats. NIEA performs this function for terrestrial/freshwater environments, on behalf of DAERA.

This advice could be provided either by DAERA (NIEA) considering every individual application on a detailed case-by-case basis, or through DAERA providing Standing Advice that sets out in detail the factors that planning authorities must consider in assessing air pollution impacts and assessments of planning applications. Standing Advice includes permissible pollution limits relative to the damage thresholds of designated sites and habitats. DAERA's approach is to provide Standing Advice and then consider air pollution assessments that have been prepared using the guidelines that are set out in the Standing Advice.

This Standing Advice is also referred to as the Operational Protocol (OP).

The predominant use of the Standing Advice/OP has been in the assessment of air pollution from agricultural facilities and activities – for example, in assessing ammonia emissions from poultry houses, pig farms, slurry storage and spreading, regarding their impacts on nearby sensitive protected or designated sites, such as peatlands, whose sensitivity to these pollution emissions is known and quantified.

As well as its use by planning authorities in assessing the air quality impacts of (predominantly agricultural) planning applications, Standing Advice/OP is also used by NIEA in consideration of the air quality impacts on designated sites from intensive agricultural and industrial activities requiring a Pollution Prevention and Control (PPC) permit, and from proposed new road schemes. In these cases, rather than ammonia emissions from animal waste, the focus is on nitrogen oxides from combustion processes.

The outcome of the air pollution impact assessment process is that a planning application could be refused, based on the damage that could be caused to nearby protected sites, or that permitting for a development (even existing, where permits are periodically reviewed) could be refused.

This could relate to, for example, farm development (farm expansion / erection of additional sheds / increased numbers of livestock etc), or to a new road scheme.

Alternatively, applications could be accepted, providing that there is mitigation to reduce levels of air pollution, for example, fitting air scrubbers to livestock sheds, covering slurry stores, or using low-emissions manure spreaders. For road schemes, this could involve changing proposed routes so that traffic emissions do not affect nearby sensitive sites.

Standing Advice/OP provided to competent authorities must be in line with legislation for protected sites including:

(a) The Conservation (Natural Habitats etc.,) Regulations (NI) 1995: Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), Ramsars.

(b) The Environment (NI) Order 2002: Areas of Special Scientific Interest – ASSIs.

The previous Standing Advice/OP used by DAERA was developed in 2012, and a supplementary note was issued in 2018. Since 2012, the body of scientific evidence on the impacts of air pollution on designated sites and protected habitats has greatly increased, while relevant case law has also provided clarity and set precedent.

The previous protocol assessed the process contribution from proposed facilities on designated sites within 7.5 km and allowed for an additional cumulative total of 10% of the Critical Level (CLe) for each site. The protocol did not consider the cumulative impacts of individual developments contributing less than 1% of the CLe.

3.2.2 The Revised Operational Protocol

3.2.2.1 Proposed objectives of the Revised Operational Protocol:

The Revised Operational Protocol will provide a framework for decision-making with regards to air pollution impacts on sensitive habitats and protected sites of ecological importance, for the purposes of planning assessments and consideration of Pollution Prevention and Control (PPC) permitting. In doing so, the Revised OP will use the most up-to-date and robust scientific evidence on the impacts of air pollution on the natural environment, and it will enable DAERA and competent authorities to fully comply with relevant obligations as set out in Section 3.B.1, above.

3.2.2.2 Contents of the Revised Operational Protocol:

The Revised Operational Protocol takes account of de-minimis thresholds for damage to sensitive habitats, which was developed by the JNCC on behalf of the Inter-Agency Air Pollution Group and DEFRA. These damage thresholds are, in general, lower (stricter / more conservative) than in the previous protocol. However, where these de-minimis thresholds are exceeded, the approach looks at Site-Relevant Thresholds.

Site-Relevant Thresholds take into account local environmental conditions and development pressure (existing agricultural developments) in proximity to the proposed development. They are determined on a case-by-case basis when individual applications are being assessed. Site Relevant Thresholds can offer flexibility by setting higher (more lenient) damage thresholds, where development pressure is low.

The decision-making process contained in the Revised Operational Protocol is set out in the following flowchart (**Figure 5**)

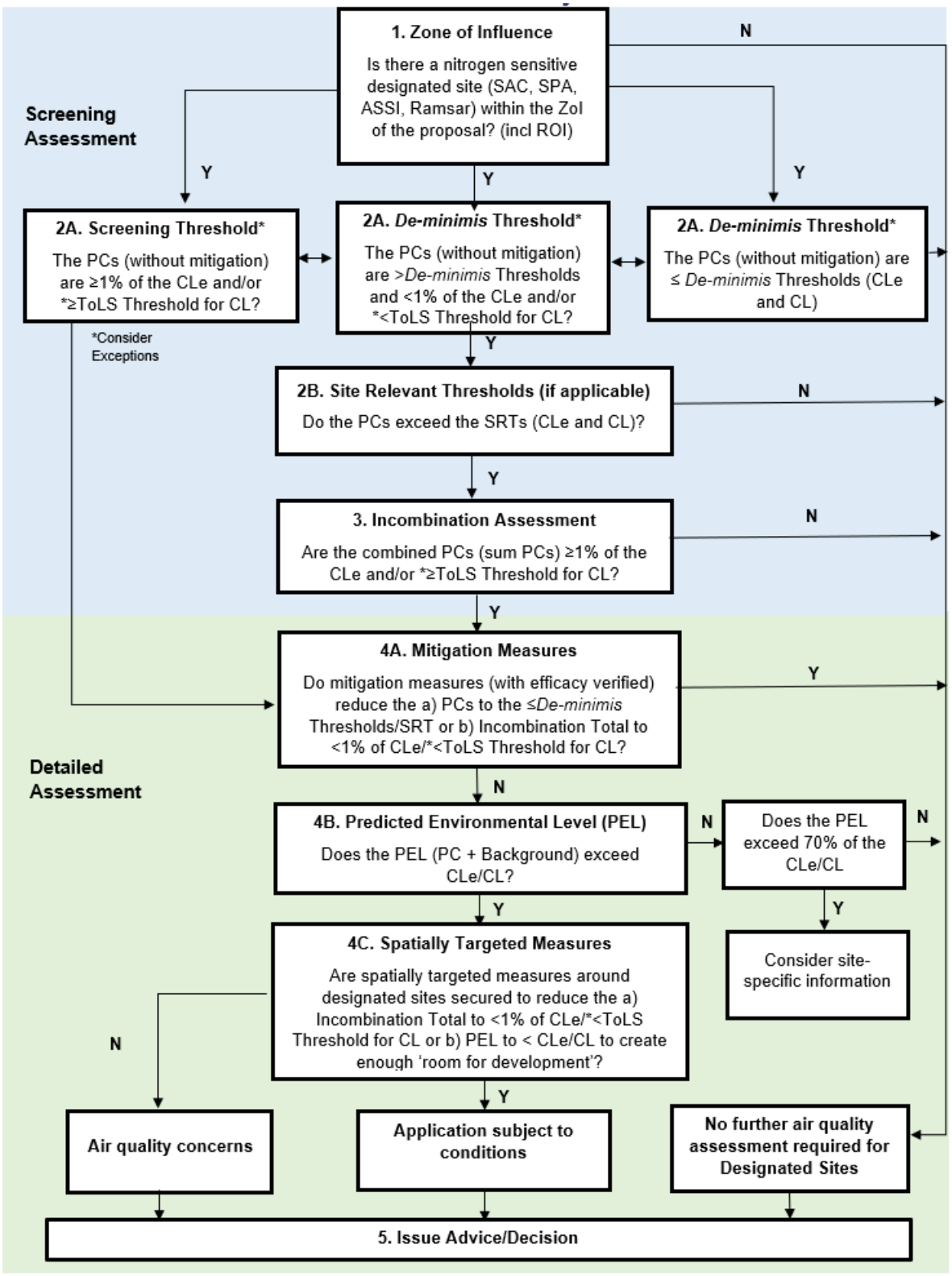


Figure 5 – Process diagram for the Revised Operational Protocol.

4. Baseline and Environmental Issues

Schedule 2 of the NI SEA Regulations[17] specifies that the Environmental Report must contain the following information in respect of baseline conditions:

"2. The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme.

3. The environmental characteristics of areas likely to be significantly affected.

4. Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds and the Habitats Directive."

A summary of the current state of the environment in NI, in respect of each of the sustainability themes is provided below, followed by a summary of the key associated environmental issues relevant to the Proposed Ammonia Strategy and Revised Operational Protocol.

4.1 SEA Theme 1 – Biodiversity, Flora and Fauna

4.1.1 State of Nature Northern Ireland 2023[18] Report

The State of Nature Northern Ireland 2023 Report categorises Northern Ireland as one of the most nature-depleted countries on Earth, due to a combination of trends in nature over the last 50 years and major changes to nature over the previous centuries. Evidence from the last 50 years shows that on land and in freshwater, significant and ongoing changes in the way land is managed for agriculture and the ongoing effects of climate change are having the biggest impacts on wildlife. At sea, and around the coasts, the main pressures on nature are climate change, marine development and unsustainable fishing. Headlines from the report are:

- A 43% decline in farmland bird species since 1996.
- An average decline in the distribution of 576 species of bryophytes (mosses and liverworts) of 54% since 1970.

[17] https://www.legislation.gov.uk/nisr/2004/280/pdfs/nisr_20040280_en.pdf
[18] https://stateofnature.org.uk/wp-content/uploads/2023/09/TP26055-SoN-N_Ireland-summary-report-v4-1.pdf

- Contrasting trends for invertebrate species - the distributions of 162 species (29%) declined and the distributions of 223 species (40%) increased, giving an average 24% increase.
- An average 30% decline in wintering waterbirds abundance.
- Of 2,508 species in Northern Ireland that have been assessed using IUCN Regional Red List criteria, 12% have been classified as threatened with extinction from Ireland as a whole.

While many previously common and widespread species are continuing to decline in Northern Ireland, a range of effective conservation tools have been developed[19], leading to improved species status and a number of success stories including:

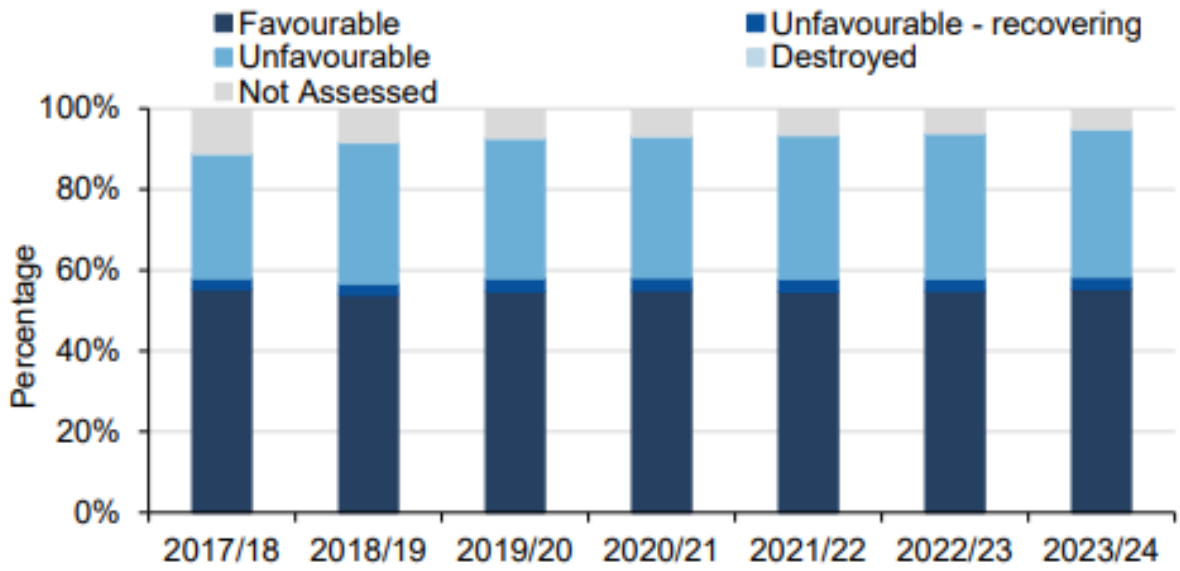
- Establishment of Northern Ireland's first Native Oyster nurseries.
- The return of the Corncrake to Rathlin in 2014.
- Pine Marten population expansion and recovery following their legal protection in 1976, with benefits for the native Red Squirrel population.
- Habitat restoration for Irish Damselfly at Montiaghs Moss reserve.

4.1.2 Northern Ireland Environmental Statistics Report 2024 – Biodiversity and Land[20]

- By March 2024, 111,159 hectares across 394 sites were declared Areas of Special Scientific Interest (ASSI). 246,300 hectares across 58 sites were declared Special Areas of Conservation (SACs) and 114,600 hectares across 16 sites as Special Protection Areas (SPAs). 77,700 hectares across 20 sites were declared Ramsar sites (areas of wetland and waterfowl conservation), and 26,178 hectares across 5 sites as Marine Conservation Zones (MCZs).
- In 2023/24, 55 per cent of features within Marine and Terrestrial protected sites were in Favourable condition while 36 per cent were in Unfavourable condition. Some 3 per cent were in Unfavourable-Recovering condition with less than 1 per cent Destroyed, shown in Figure 6.
- The wild bird population indicator using 56 bird species shows decreased levels in 2022 compared to 1996. Bird populations peaked in 2005 and have been in decline since, driven principally by bird species found in farmland habitats.

[19] Sutherland, W.J., et al., What Works in Conservation. 2020, Cambridge, UK: Open Book Publishers.
[20] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/NI%20Environmental%20Statistics%20Report%202024_0.pdf

- In 2023/24, 433 hectares of new woodland (41 hectares conifer and 392 hectares broadleaf) were planted by NI Forest Service and private landowners supported by grant aid.
- Agri-environment schemes encourage farmers and landowners to manage their land to benefit the environment. At the end of 2023, 62,000 hectares of land in Northern Ireland were under agri-environment scheme agreement.



Source: NIEA

Figure 6. Condition of Features within Marine and Terrestrial protected sites, 2017/18 – 2023/24[11]

Further detail on the condition of features within Terrestrial and Marine protected sites is shown in Table 15. The table shows the range in the proportion of features in favourable condition for habitats, species and earth science features. The range for habitats in favourable condition is from 6% for woodlands to 87% for marine; the range for species in favourable condition is from 44% for fish to 91% for terrestrial mammals; and 93% of earth science features are in favourable condition.

Table 15. Condition of features within terrestrial and marine protected sites by type of feature, year ended March 2024.

Feature Type	Number of Features	Number of Features in Favourable Condition	Proportion Favourable %
Habitats			
Bogs	53	12	23%
Coastal	52	22	42%
Freshwater	58	17	29%
Grasslands	102	64	63%
Heathlands	43	6	14%
Inland Rock	16	11	69%
Marine	46	40	87%
Fen, marsh & swamp	89	27	30%
Woodlands	80	5	6%
Habitats Total	**539**	**204**	**38%**
Species			
Birds	369	230	62%
Fish	9	4	44%
Invertebrates	133	66	50%
Marine Mammals	7	5	71%
Non-Vascular Plants	43	21	49%
Terrestrial Mammals	11	10	91%
Vascular Plants	71	34	48%
Species Total	**643**	**370**	**58%**
Earth Science			
Earth Science	204	190	93%
Earth Science Total	**204**	**190**	**93%**
Total	**1,386**	**764**	**55%**

4.1.3 Article 17 Habitats Directive Report 2019: Habitat Conservation Status Assessments[21]

EU Member States are required, under Article 17 of the Habitats Directive, to report every six years on their implementation of the Directive. The most recent report, covering the period 2013-2018, was published in 2019. Monitoring of the conservation status of all habitats and species of community interest is required.

The overall intention is to achieve Favourable Conservation Status (FCS), a situation where a habitat type or species is thriving in both quality and extent/population. Habitats and species listed in the Annexes of the Directive are those that were threatened at European level at the time of listing and are therefore likely to be in unfavourable conservation status.

A separate assessment is required for each species and habitat listed in the annexes of the Directive that occur in the Member State's territory. For NI there are individual country reports for

[21] https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-habitats/

49 habitats and 28 species. Only one of the 49 Annex 1 habitats in Northern Ireland was reported to be in favourable condition. Twenty-nine were in Unfavourable (bad) condition, 10 were Unfavourable (inadequate) and the status of 9 habitats were recorded as Unknown (insufficient data to make a conclusion on their condition status). This is very similar to the UK as a whole, where the majority of Annex 1 habitats were reported to be in Unfavourable (bad) condition.

Northern Ireland has a marginally higher proportion of Favourable and Unfavourable–inadequate habitats. This reflects, in part, the fact that positive management measures have been undertaken at a number of individual sites, particularly for some coastal habitats where a high proportion of the resource is within the protected sites network.

The results for NI species reflect a similar picture to the overall UK pattern. A much higher proportion of species were recorded as favourable, compared to habitats. Twelve species were assessed as being in favourable conservation status, with 3 inadequate, 2 bad, and 11 unknown, due to insufficient data to reach a conclusion.

The latest Article 17 report identified the main pressures and threats to habitats to be agriculture, climate change, development, air pollution and invasive species. Agriculture, development, woodland management and water pollution were recorded as the main pressures and threats to species.

4.1.4 Global Biodiversity Framework

The Kunming-Montreal Global Biodiversity Framework (GBF) was adopted during the fifteenth meeting of the Conference of the Parties (COP 15) following a four-year consultation and negotiation process. This historic Framework, which supports the achievement of the Sustainable Development Goals and builds on the Convention's previous Strategic Plans, sets out an ambitious pathway to reach the global vision of a world living in harmony with nature by 2050.[22]

At COP 15, the UK signed up to an international commitment to protect and conserve a minimum of 30% of land and sea for biodiversity by 2030, known as 30x30. This target will be a key driver in reversing the decline of nature in the UK, by expanding and improving our protected areas and creating new areas for wildlife, allowing nature to spill over into the wider landscape. In the UK, Natura 2000 sites, and Sites of Special Scientific Interest (SSSIs)* will play a key part in the delivery of the 30x30 target.[23] **Note than in Northern Ireland, these are referred to as ASSIs – Areas of Special Scientific Interest.*

[22] https://www.cbd.int/gbf
[23] https://naturalengland.blog.gov.uk/2023/12/11/30-by-30-a-boost-for-nature-recovery/

Box 12. SEA Theme 1

SEA Theme 1 – Biodiversity, flora and fauna

Key Environmental Issues

- Declines in farmland bird species, bryophyte distribution and wintering waterbirds.
- Species on the IUCN Regional Red List at risk of extinction.
- 36% of features in Marine and Terrestrial protected sites in Unfavourable condition.
- Only one of the 49 Annex 1 habitats in Northern Ireland reported to be in Favourable condition.
- Threats to habitat conservation status from be agriculture, climate change, development, air pollution and invasive species.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- The pace of addressing the issues listed and the degree of potential environmental improvement will be lessened, i.e greater environmental detriment will occur.

4.2 SEA Theme 2 - Population and Human Health (NB Information covering the relationship between human health and air and water quality is covered in the respective SEA Air and Water Themes).

4.2.1 Census 2021 Population and household estimates for Northern Ireland[24]

The population of Northern Ireland on Census Day, 21 March 2021, was 1,903,175, while the number of households in Northern Ireland was 768,810. This population figure is the highest ever recorded and represents 2.80% of the total population of the UK and 27.50% of the total population of the island of Ireland. On census day, there were 365,200 children (aged 0 to 14) or 19% of the population. Those aged 65 and over-represented 17% (326,500) of the population. The remaining 64% of the population, or 1,211,400 people, were aged between 15 and 64 years.

[24] https://datavis.nisra.gov.uk/census/census-2021-population-and-household-estimates-for-northern-ireland-statistical-bulletin-24-may-2022.html

4.2.2 Key Rural Issues Northern Ireland 2023[25]

More than a third of NI's population lives in a rural area, and the rate of population growth in rural areas is higher than in urban areas. Between 2001 and 2020, the population of rural areas rose by 20%, compared to an increase of just 7% for urban areas. As a result, the rural share of the overall NI population grew from 34% to 36%. Areas with fastest growth were those close to urban centres, either in mixed rural/urban areas (36%) or less than an hour's commute from Belfast (22%).

In terms of health and wellbeing, People living in rural areas are consistently more likely to rate their happiness and life satisfaction as high, and their anxiety levels as low. In 2023, life expectancy was higher in rural areas (80.3 years for males, 83.7 years for females), a slight decline on 2022.

4.2.3 Health Survey (NI): First Results 2022/23[26]

The Health Survey found that, in 2022/23, almost three-quarters of respondents (72%) rated their general health as very good or good; similar to 2021/22. A tenth of respondents (10%) rated their general health as bad or very bad, the same as in 2021/22. Very good or good self-assessed general health declined with age from 90% of 16–24-year-olds to around half (51%) of those aged 75+.

Three-quarters (75%) of those living in rural areas rated their health as good or very good compared with over two-thirds (70%) of those living in urban areas.

In the Health Survey a high GHQ12 score could indicate a mental health problem. Males in 2022/23 (18%) were less likely than females (22%) to have a high GHQ12 score. The proportion of males and females scoring highly on the GHQ12 had returned to pre-pandemic levels. For people living in urban areas 23% had a high GHQ12 score compared with 17% of those living in rural areas.

Almost two-fifths (38%) of those living in urban areas had concerns about their own mental health in the past year (18% definitely; 20% to some extent), compared with a quarter (25%) of those living in rural areas (11% definitely; 13% to some extent). Those living in urban areas (21%) were more likely to show signs of loneliness than those living in rural areas (16%).

[25] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Key%20Rural%20Issues%202023.pdf
[26] https://www.health-ni.gov.uk/sites/default/files/publications/health/hsni-first-results-22-23.pdf

Those living in rural areas were more likely to report very high levels of life satisfaction, feeling worthwhile, happiness, and very low levels of anxiety (43%), than those in urban areas.

4.2.4 Life Expectancy in Northern Ireland 2020-22[27]

Since 1980-82, life expectancy at birth in Northern Ireland has increased by 6.8 years for females and 9.2 years for males. Life expectancy at birth in 2020-22 was 78.4 years for males and 82.3 years for females. Life expectancy refers to the average number of years a person could expect to live if the current mortality patterns remain constant. In 2020-22, females in Northern Ireland could expect to live 3.9 years longer than males.

4.2.5 Health Inequalities Annual Report 2024[28]

The Health Inequalities Annual Report 2024 includes Urban-Rural analysis based on the 2015 NISRA Urban-Rural classification. The findings of the report's Urban-Rural analysis were that, compared with the rural areas, urban areas experienced worse outcomes across the majority of indicators analysed, however fire and ambulance response times were higher in rural areas.

[27] https://www.health-ni.gov.uk/sites/default/files/publications/health/hscims-life-expectancy-ni-2020-22_0.pdf
[28] https://www.health-ni.gov.uk/sites/default/files/publications/health/hscims-report-2024.pdf

Outcomes that were significantly worse in urban areas than rural areas

Male Life Expectancy at Birth	SPR Antihypertensive	SDR Lung Cancer
Female Life Expectancy at Birth	SPR Statin	SAR Drug Related
Female Healthy Life Expectancy	SAR Respiratory	SDR Drug Related
Female Disability Free Life Expectancy	SAR Respiratory (U75)	SDR Drug Misuse
Male Disability Free Life Expectancy	SIR Cancer	Smoking During Pregnancy
Male Life Expectancy at 65	SAR All	Teenage Birth Rate
Female Life Expectancy at 65	SAR Emergency	Breastfeeding on Discharge
SDR – All Deaths	SAtR Emergency Care	Low Birth Weight
PYLL	SAR Day Case	Small for Gestational Age
SDR Treatable	SAR Self Harm	P1 Obese
SDR Preventable	CDR Suicide	P1 Overweight or Obese
SDR Avoidable	SPR Mood & Anxiety	Dental Fillings
SDR Circulatory (U75)	SAR Alcohol Related	Dental Extractions
SDR Respiratory (U75)	SDR Alcohol Specific	Dental Crownings
SDR Cancer (U75)	SDR Smoking Attributable	Dental Registrations
SDR All Cause (U75)	SIR Lung Cancer	Dental Registrations (U18)

Outcomes that were significantly better in urban areas than rural areas

Ambulance Response Times	Dental Fillings (U18)	Dental Extractions (U18)
Fire Response Times		

Outcomes that were similar (or not significantly different) in urban areas and rural areas

Male Healthy Life Expectancy	SAR Circulatory (U75)	Y8 Obese
Infant Mortality Rate	SAR Elective Inpatient Admissions	Y8 Overweight or Obese
SAR Circulatory	SDR – COVID-19	

Figure 7. Urban-Rural analysis of health outcomes.

Figure 7 shows that 48 health outcomes were significantly worse in urban areas than in urban areas, 4 health outcomes were significantly better in urban areas than in rural areas and eight health outcomes were not significantly different between urban and rural areas.

Box 13. SEA Theme 2

SEA Theme 2 – Population and human health

Key Environmental Issues

- Water quality – see section 4.4.3.
- Air quality – see section 4.4.5.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Increased risk of direct and indirect effects on human health, see Section 4.4.5 SEA Theme 5 – Air.

4.3 SEA Theme 3 – Water

4.3.1 Northern Ireland Environmental Statistics Report 2024 – Water and Marine[29]

Of the twenty-five inshore coastal waterbodies delineated in Northern Ireland, 13 (52 per cent) have been assessed at good or better ecological condition.

In 2023 soluble reactive phosphorus (SRP) was measured at 93 surveillance rivers across Northern Ireland giving an average concentration of 0.062 mg/l of phosphorus per litre of water. This was 0.015 mg/l more than the lowest figure reported in this time series, 0.047 mg/l in 2012.

Water pollution incidents are investigated by Northern Ireland Environment Agency (NIEA). In 2023 there were 1,851 incidents reported to NIEA or discovered by NIEA during inspections, of which 821 (44 per cent) were substantiated (confirmed) as having an impact on the water quality of the receiving waterway. Of these, 20 per cent were considered to be of High or Medium Severity.

One out of nine designated shellfish water protected areas (SWPAs) complied with the Water Framework Directive Guideline E. Coli standard in Shellfish Flesh in 2023.
Although the most recent long-term seasonal trend analysis carried out over the 28-year period from 1992-2019 showed that the monthly trends in average nitrate concentrations in rivers in Northern Ireland were predominantly decreasing or stable, observationally it appears that they are no longer declining. A review of the measures implemented through the Nutrient Action Programme is to be carried out and will include updated long term seasonal trend analysis of nitrate concentrations.

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. However, from the low of 0.047 mg/l reported in 2012, levels of soluble reactive phosphorus in the 93 Surveillance Rivers have increased to 0.062 mg/l in 2023.

[29] https://www.daera-ni.gov.uk/publications/northern-ireland-environmental-statistics-report-2024

4.3.2 NIAO Report – Water Quality in Northern Ireland's Lakes and Rivers

The Northern Ireland Audit Office published a report on Water Quality in Northern Ireland's Rivers and Lakes in March 2024[30], which found that the target for 100 per cent of surface water bodies in Northern Ireland to attain 'Good' or 'High' ecological status by 2027 will not be met. The report noted that published outcomes show both river and lake (surface) water bodies have been falling short of the ecological status target and that, since 2015, the ecological status of Northern Ireland's rivers has not improved and has deteriorated for lakes. The report stated that current approaches to improve the management of agricultural practices are not effectively addressing long-standing issues around water quality and made four recommendations in relation to water quality in Northern Ireland.

4.3.3 Ammonia and Waterbody Status in Northern Ireland

The Water Framework Directive (Classification, Priority Substances and Shellfish Waters) Regulations (Northern Ireland) 2015[31] sets out criteria to identify the types of rivers to which dissolved oxygen, ammonia and biochemical oxygen demand standards for rivers apply. Table 16 below sets out the standards for ammonia in rivers, for different river types. The data on ammonia in rivers does not distinguish between ammonia from agricultural sources or other sources.

Table 16. Standards for ammonia in rivers for different river types[16].

Total ammonia [(1)] *(mg/l)* (90-percentile)					
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Type	High	Good	Moderate	Poor	Bad
Upland and low alkalinity	0.2	0.3	0.75	1.1	> 1.1
Lowland and high alkalinity	0.3	0.6	1.1	2.5	> 2.5

(1) Note that Ammonia is a Specific Pollutant and considered as such for compliance. It is included in this section as it is commonly assessed alongside the other inorganic chemistry elements.

Data for 2021 in Northern Ireland, reported under the Water Framework Directive requirements, showed that for the 427 rivers with an assigned Ammonia River Waterbody Status:

[30] https://www.niauditoffice.gov.uk/publications/water-quality-northern-irelands-rivers-and-lakes
[31] https://www.legislation.gov.uk/nisr/2015/351/pdfs/nisr_20150351_en.pdf

- 350 rivers had a High Ammonia River Waterbody Status (i.e. a low level of ammonia as shown in Table 17, Column 2, above).
- 53 rivers had a Good Ammonia River Waterbody Status.
- 21 rivers had a Moderate Ammonia River Waterbody Status.
- 3 rivers had a Poor Ammonia River Waterbody Status.
- There were no rivers with Bad Ammonia River Waterbody Status.

4.3.4 The Lough Neagh Report - Blue Green Algae and Water Quality in Northern Ireland July 2024[32]

In 2023 a number of factors resulted in significant algal blooms in the internationally important Lough Neagh, referred to as The Blue Green Algae Crisis. These factors were:
- Pollution (excess phosphorus and nitrogen) entering waterways from agriculture, wastewater treatment works, domestic systems and industry.
- Climate change resulting in record high water temperature.
- Zebra mussels, an invasive species known to disrupt ecosystems by impacting water clarity.

The Lough Neagh Report Action Plan sets out 37 Key Actions/Recommendations to address the environmental decline in Lough Neagh. Measures which will impact on nitrogen/ammonia include:

Action Plan Number 1 - Deliver Water Quality monitoring outreach events to farm businesses in the Lough Neagh catchment to build on the information provided by soil analysis and runoff risk mapping within the Soil Nutrient Health Scheme (SNHS). To optimise nutrient application on the farm.

Action Plan Number 3 - Provision of training in compliance and environmental performance to slurry spreading contractors. To reduce risk of runoff to watercourses.

Action Plan Number 4 - Scope and implement a suite of water quality-based initiatives including farm sustainability training and advisory campaigns, ensuring that these incorporate actions to promote experiential learning.

Action Plan Number 6 - Scope a Conservation Management Plan for Lough Neagh, to inform a future management plan towards restoring the Lough Neagh ecosystem to favourable

[32] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Lough%20Neagh%20Report%20and%20Action%20Plan.pdf

conservation status.

Action Plan Number 9 - Scope the development of a simple information system for slurry spreading. To provide a warning when heavy rainfall is forecast, and conditions are unsuitable for slurry spreading and consulting upon mandating adherence to this advice. Reducing point source nutrient losses from agriculture.

Action Plan Number 10 - Launch a Small Business Research Initiative (SBRI) Phase 2 project to improve the Sustainable Utilisation of Livestock Slurry (SULS) and develop demonstrator sites to process livestock manure/slurry. Removes excess phosphorus from the environment.

Action Plan Number 11 - Establish and deliver a Livestock Dietary Emissions Challenge through the Defra-Led Dairy Demonstrator Project to formulate and test on farm livestock diets which reduce ammonia emissions, phosphorus losses and greenhouse gas in Dairy herds in Northern Ireland. Reduces phosphorus and nitrogen inputs.

Action Plan Number 15 - Scope the expansion of the Sustainable Catchment Programme (SCP) into more Lough Neagh catchment areas. Reducing point and diffuse nutrient losses from agricultural sources. Scope the mandatory participation in the SCP within the FwN packages.

Action Plan Number 22 - Complete the statutory review of the Nutrients Action Programme (NAP), consult on proposals within the updated NAP and introduce revised NAP Regulations. Reduce the nutrient losses to water from agricultural sources.

Action Plan Number 24 - Introduce a Fertiliser Database to record fertiliser movements along the supply chain in NI from merchants/suppliers to farmers. Consult within the NAP Review during 2024. Improve nutrient management and farm efficiency.

Action Plan Number 25 - Establish a DAERA group to develop a proposed response to the excess nutrient problem that will significantly reduce the adverse environmental consequences. Engage and fully consult with stakeholders regarding a new regulatory framework for the processing of slurry to reduce land spreading of excess phosphorus, resulting in renewable energy production and recycling/reuse of organic nutrients. Reduce phosphorus loading to land.

Box 14. SEA Theme 3

SEA Theme 3 – Water

Key Environmental Issues

- The Blue Green Algae Crisis.
- Increasing levels of soluble reactive phosphorus in the 93 Surveillance Rivers to 0.062 mg/l in 2023.
- Less than one third of Northern Ireland's rivers with good ecological status in 2021, representing no improvement since 2015.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Reduced ability to lessen losses of ammonia and nitrogen to the environment in Northern Ireland.

4.4 SEA Theme 4 – Soil

Soils are generally regarded as a non-renewable resource given that it takes around 100 years to create 1 cm of soil[33] in typical favourable temperate conditions. Soils provide a wide range of vital ecosystem services such as: filtration and transformation of nutrients; storage of carbon; regulating flows and storing surface water; providing habitats and supporting biodiversity and food production. Depending on their condition and land use, soils may be degraded, disturbed or lost through activities which result in compaction, poaching, erosion, sediment loss or changes in fertility. Water soluble nutrients such as nitrates can move through well-drained soils such as brown-earth soils and can reach groundwater through locally and regionally important aquifers where the nutrient can be transported long distances, whereas in these well-drained soils, phosphate typically becomes bound up in soil minerals. Poorly draining and waterlogged soils, such as organic soils or gley-type soils, can be the source of increased surface run-off, sediment loss to water courses and elevated phosphorous concentrations in water.

4.4.1 Geology of Northern Ireland

The geological map of Northern Ireland shows a very high level of variation in rocks relative to the size of the country, illustrated in the simplified geological map presented in Figure 8. Geological

[33] https://assets.publishing.service.gov.uk/media/5f34fdef8fa8f5174ac78f26/ncc-advice-soil-management.pdf

time periods represented range from Precambrian to Recent, and excepting Cambrian, rocks from every other period are represented[34]. The variation in age of rocks accompanies variation in rock types, from igneous granites and basalts to sedimentary mudstones, sandstones and limestones.

The solid rocks in Northern Ireland generally fall into four structural blocks, illustrated in Figure 9, giving a framework for their description. These natural blocks are:

i. the metamorphic basement in the northwest.
ii. the Lower Paleozoic rocks of the Down-Longford Massif in the southeast.
iii. the complex zone in the southwest from Coalisland in south Tyrone to Fermanagh.
iv. the volcanic rocks of the Antrim Plateau in the northeast[20].

From a soil development perspective, while the structural complexity of the solid rocks in NI is a fact, it is where they lay during soil formation that is significant, specifically since the retreat of the last ice sheet about 13,000 years ago[20].

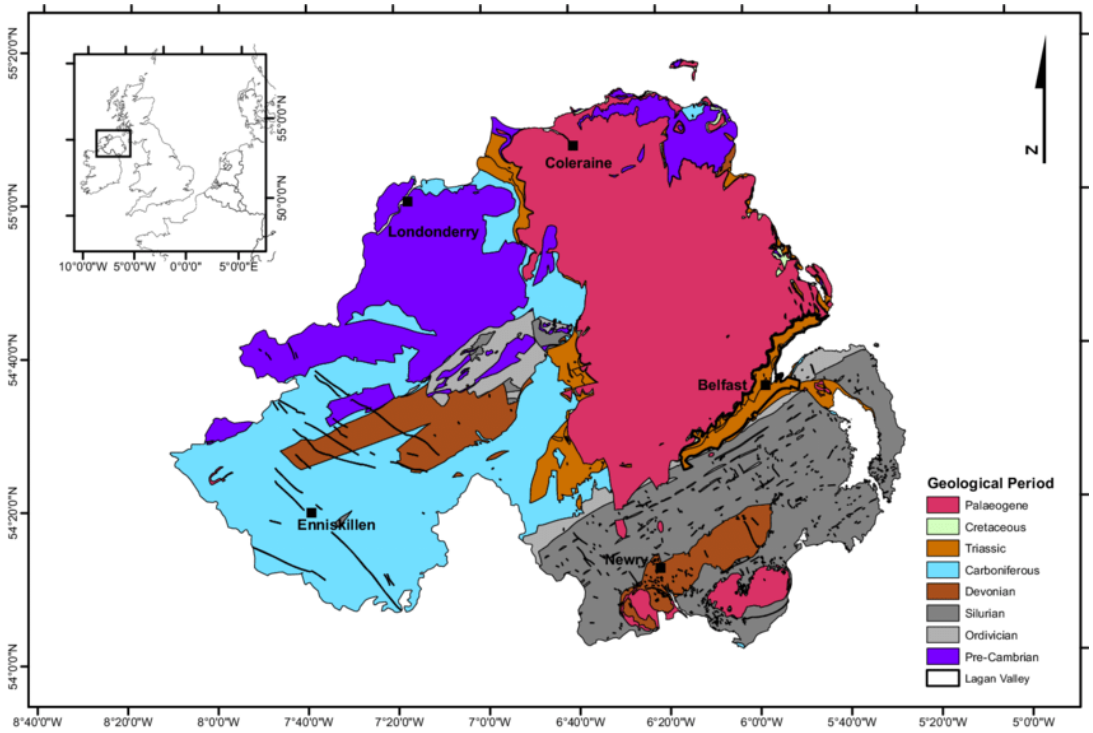


Figure 8 A simplified geological map of Northern Ireland[35].

[34] Cruickshank, C.J. (Ed) (1997) Soil and Environment Northern Ireland. Agriculture and Environmental Science division, DANI and The Environmental Science Department, The Queen's University of Belfast.
[35] Dickson, Neil & Comte, Jean-Christophe & Mckinley, Jennifer & Ofterdinger, Ulrich. (2015). Dickson et al., 2014 WRR Paper.

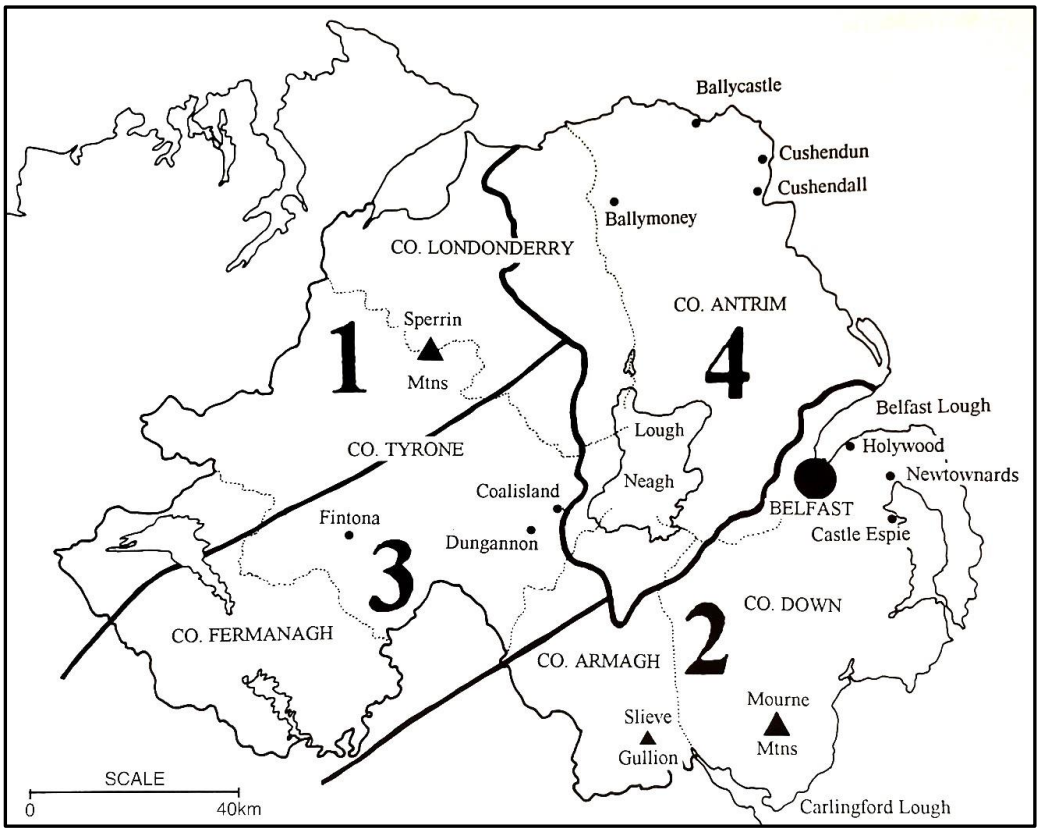


Figure 9 Outline map of Northern Ireland showing principal geological divisions. Block 1 – Metamorphic Basement; Block 2 – Low Paleozoic rocks; Block 3 – Devonian and Carboniferous rocks; Block 4 – Antrim Plateau, mostly of Tertiary basalt lavas[20].

4.4.2 Soil Types in Northern Ireland

The World Reference Base map shows the locations of the nine reference soil groups recognised in Northern Ireland. It is derived from the General Soil Map of Northern Ireland at 1:250 000 scale, held by the Agri-Food and Biosciences Institute (AFBI). The dominant soil series in each soil group has been correlated to the equivalent Tier 1 Reference Soil Group in the World Reference Base classification system of 2006 as defined in World Soil Resources Report No. 103.[36] The map is shown in Figure 10

[36] https://www.ukso.org/static-maps/soils-of-northern-ireland.html

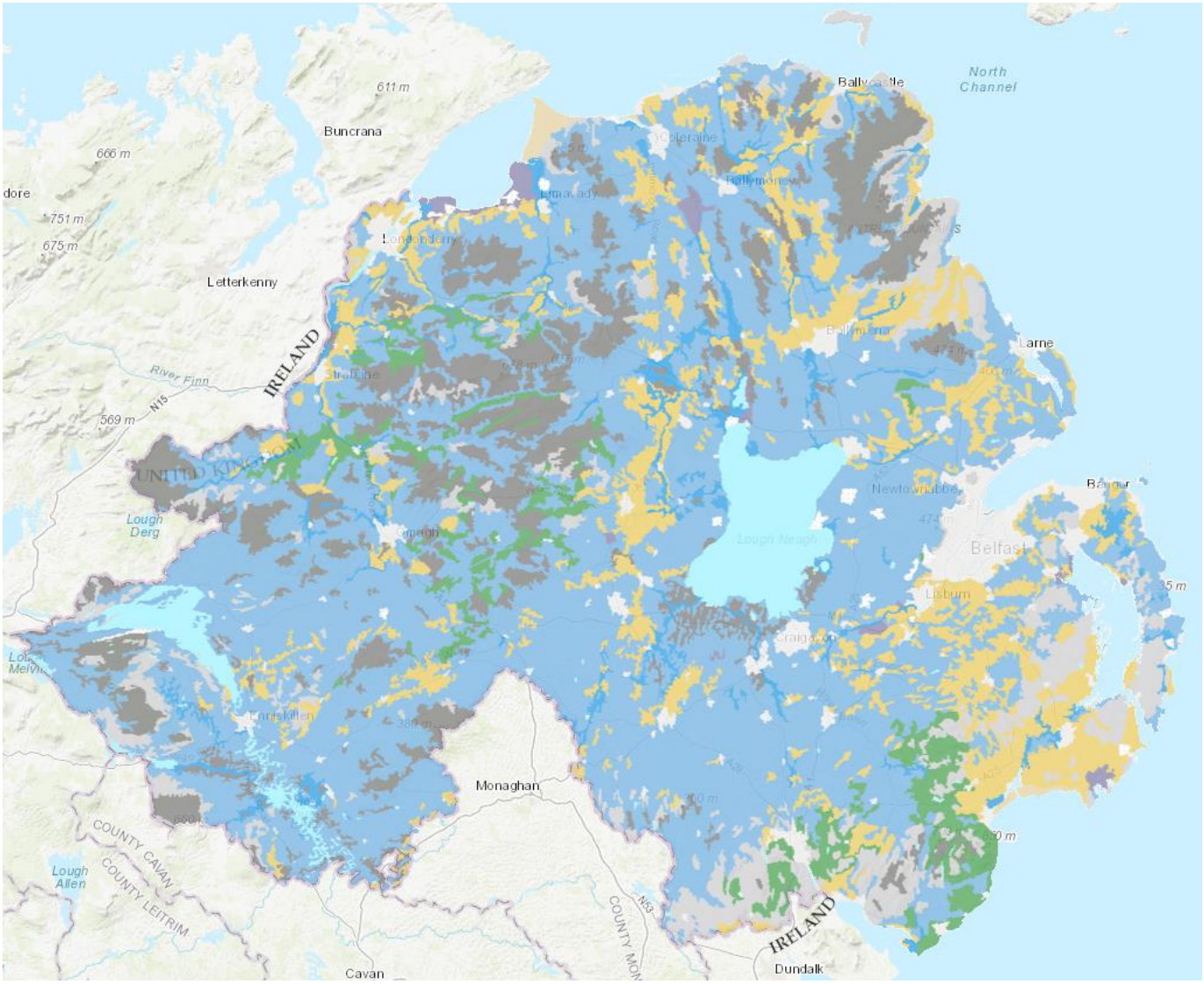


Figure 10 Soil Map for Northern Ireland (World Reference Base classification)[37]

[37] https://mapapps2.bgs.ac.uk/ukso/home.html?layer=AFBIWRB

Table 17. AFBI World Reference Base soil types across Northern Ireland.

AFBI World Reference Base	General occurrence across Northern Ireland
Arenosols (sandy-textured soils that lack any significant soil profile development)	Located in coastal areas such as Murlough in County Down and Portrush in County Antrim
Cambisols (soil in the beginning of soil formation)	Most prevalent in the southeast, around County Down
Fluvisols (genetically young soil in alluvial deposits)	Generally, widely dispersed across Northern Ireland in small pockets
Gleysols (wetland soils, which in the natural state are continuously water-saturated within 50 cm of the surface, for long periods of time)	Generally, occur in small, isolated pockets across Northern Ireland
Histosols (soil consisting primarily of organic materials)	Generally present in the northwest, around the Sperrin Mountains and in the Antrim Hills
Leptosols (shallow soils with minimal development, formed typically on hard rock or highly calcareous materials)	Generally, most prevalent in the southeast, around the Mourne Mountains and surrounding Strangford Lough
Podzols (soils with an ash-grey subsurface horizon, bleached by organic acids, on top of a dark accumulation horizon with brown or black illuviated humus and/or reddish iron compounds)	Most prevalent in the southeast and west
Stagnosols (soil with strong mottling of the soil profile due to redox processes caused by stagnating surface water)	Most abundant soil type, which is present across Northern Ireland but most dominant in the south and southwest
Urban (soil material having a non-agricultural, man-made surface layer more than 50 cm thick)	Mostly present around the Greater Belfast, Bangor and Lisburn urban areas

Contaminants generally pass through high permeability, well-drained soils, such as Leptosols, Cambisols, Fluvisols etc., reaching groundwater through locally and regionally important aquifers where they can be transported long distances. Poorly draining and waterlogged soils, such as organic soils (peats), Stagnosols or Gleysols, cause increased surface run-off and siltation issues

which can impact on downstream surface waterbodies. Stagnosols are the most abundant soil type across Northern Ireland in areas of lower lying areas.

Box 15. SEA Theme 4

SEA Theme 4 – Soil

Key Environmental Issues

- Potential for effects on soil nutrient levels.
- Potential for effects on nitrate and phosphate vulnerability of soils (and associated groundwater susceptibility).
- Potential influence of soil type on land use practices (e.g. fertiliser application).
- Potential for effects on discharges to receiving aquatic sediments.
- Potential for effects on land use within agricultural holdings.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Reduced ability to tackle the key environmental issues impacting on soils

4.5 SEA Theme 5 – Air

4.5.1 Northern Ireland Environmental Statistics Report 2024[38]

In 2023 there was no breach of the UK Strategy Objective or The Air Quality Standards Regulations Limit Values of 40 µg/m^3 for the annual mean concentration of particulate matter (PM_{10}). The annual mean concentration of PM_{10} across urban areas was 13 µg/m^3 and the mean for the Lough Navar rural background monitoring site was 7 µg/m^3.

In 2021, of the ammonia emissions from agriculture, 86 per cent came from livestock, 8 per cent from the application of fertilisers containing nitrogen and 6 per cent from the application of other organic materials to land (sewage sludge and digestate).

[38] https://www.daera-ni.gov.uk/publications/northern-ireland-environmental-statistics-report-2024

4.5.2 Air Pollution in Northern Ireland 2022[39]

This Air Pollution in Northern Ireland Annual Report summarises air quality monitoring results for Northern Ireland, in order to inform the public, government and wider air quality community in Northern Ireland. This report also provides information on air quality policy and legislation and sources of pollution. The locations of all air quality monitoring sites in Northern Ireland are provided.

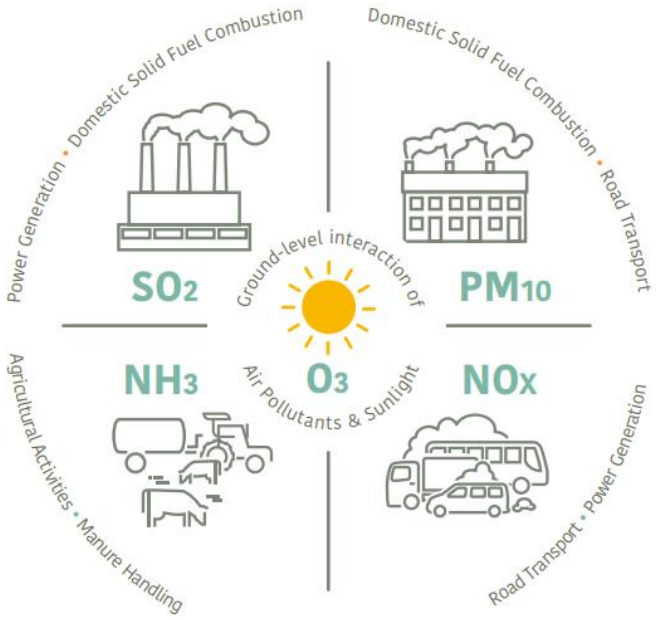


Figure 11. Main Sources of Air Pollution in Northern Ireland[39].

Figure 11 shows the main sources of air pollution in Northern Ireland:

- Nitrogen oxides (NO_x which includes nitrogen monoxide, NO - also called 'nitric oxide' - and nitrogen dioxide, NO_2): from combustion of fuels, most importantly in transport and energy generation.

- Sulphur dioxide, SO_2: a pollutant produced during combustion of fuels containing sulphur (such as coal), particularly from power generation, industry, and household heating.

- Particulate matter, PM_{10} and $PM_{2.5}$: by-products of burning fuels, in particular use of solid

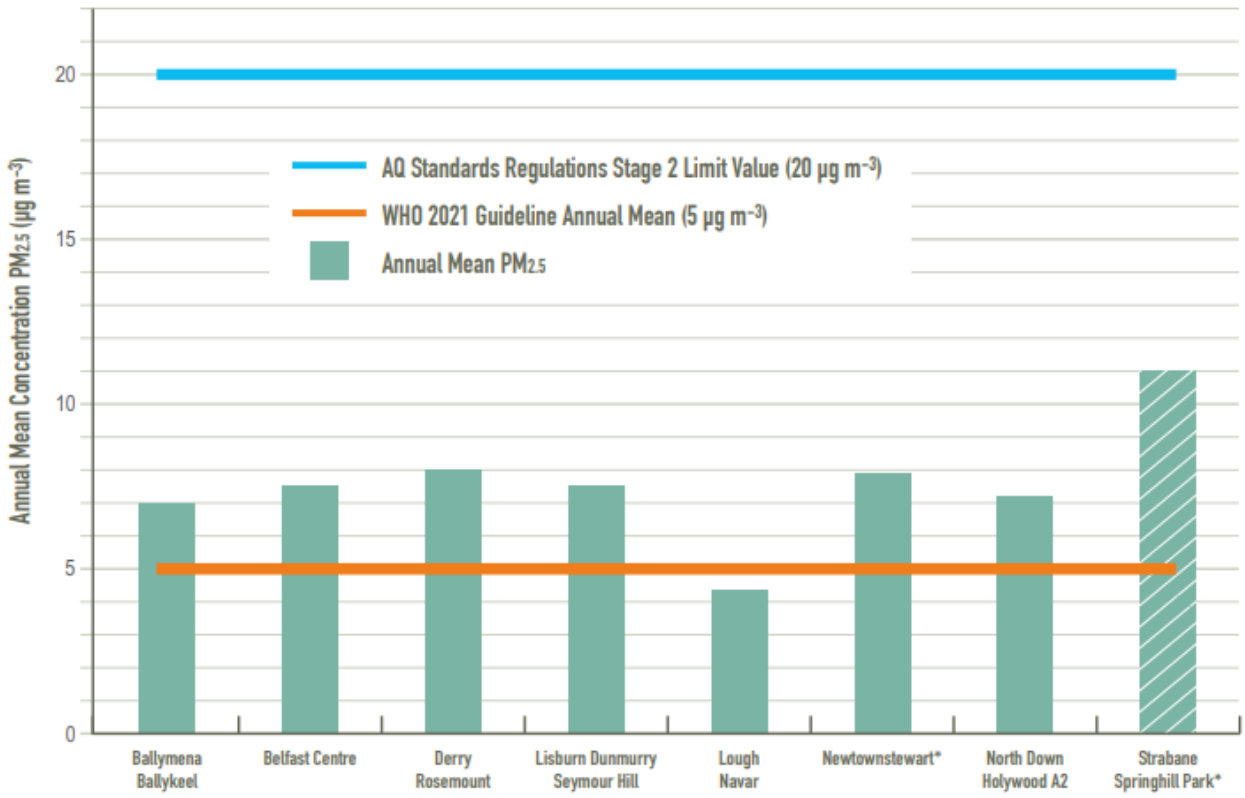
[39] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Air%20Pollution%20in%20Northern%20Ireland%202022%20report%20%28Screen%20Version%29.pdf

fuels (e.g. domestic wood and coal burning), industrial combustion and road transport.

- Ground-level ozone, O_3: a secondary pollutant, formed by the interaction of other air pollutants in the presence of sunlight.

- Ammonia, NH_3: a gas that is emitted from waste and agricultural activities – in particular, manure handling, storage and spreading. Ammonia contributes to air pollution because it can react with other pollutants (such as oxides of nitrogen and sulphur) to produce fine particles of ammonium nitrate and ammonium sulphate (secondary particulate matter), emphasising the importance of policies directed to mitigate ammonia emissions.

- The Air Pollution in Northern Ireland 2022 report sets out air quality monitoring results for a range of air pollutants. Results of continuous monitoring of $PM_{2.5}$ at eight sites in 2022, presented in Figure 12 showed the annual mean $PM_{2.5}$ concentrations for 2022 at all sites except one where the data capture rate was too low to use. Results noted that with a data capture rate of 39%, the annualised annual mean should be treated with caution. All sites reported annual mean $PM_{2.5}$ concentrations well below the Air Quality Regulations Stage 2 limit value of 20 µg m^{-3} (which had to be achieved by 1 January 2020). All sites, with the exception of the rural site at Lough Navar, exceeded the new WHO guideline for annual mean $PM_{2.5}$ concentrations (5 µg m^{-3}), in 2022.



* Asterisk indicates sites with < 85% data capture
Where the valid data capture is less than 75%, the means have been "annualised" and shown as a striped bar

Figure 12. Annual Mean $PM_{2.5}$ Concentrations for 2022.

4.5.3 Air Quality

Poor air quality is known to disproportionately affect certain sectors of the general population – in particular the young, the elderly, and those with lung and/or heart conditions.

Ammonia emissions are of particular relevance to air pollution because ammonia can, in combination with other air pollutants, form fine particulate matter, $PM_{2.5}$. $PM_{2.5}$ can act directly as a respiratory irritant in the airways. Because of the small size of these particles, they may cross from the lungs into the bloodstream, where they can have more indirect systemic effects, such as increasing the risk of cardiovascular disease and stroke.

Levels of $PM_{2.5}$ in Northern Ireland meet objectives set out in legislation, however the World Health Organisation (WHO) has set more stringent guideline values for $PM_{2.5}$, based on the recommendation that there is no safe level of exposure to $PM_{2.5}$. WHO guideline values are exceeded at most (7 of 8) locations where $PM_{2.5}$ is monitored in NI (see Figure 13). A recent study highlights that approximately 30% of $PM_{2.5}$ in Europe is caused by agricultural ammonia emissions, that reducing ammonia emissions can reduce ambient $PM_{2.5}$, reducing premature mortality, and that regulating NH_3 as a precursor to $PM_{2.5}$ is cost efficient, and will protect human health.

4.5.4 Ammonia, Fine Particulate Matter and Human Health

Ammonia can have potential direct and indirect effects on human health via the mechanisms set out in Figure 13. Direct impacts on the respiratory health of those who handle livestock can include a reduced lung function, irritation to the throat and eyes, and increased coughing. In addition to the potential direct impact of ammonia, it is also a substantial contributor to the fine particulate matter ($PM_{2.5}$) fraction (namely the US and Europe); where it accounts for the formation of 30% and 50% of all $PM_{2.5}$ respectively. $PM_{2.5}$ has the ability to penetrate deep into the lungs and cause long term illnesses such as Chronic Obstructive Pulmonary Disease (COPD)[40].

[40] Wyer et al. (2022) Ammonia emissions from agriculture and their contribution to fine particulate matter: A review of implications for human health. Journal of Environmental Management Volume 323, 1 December 2022, 116285.

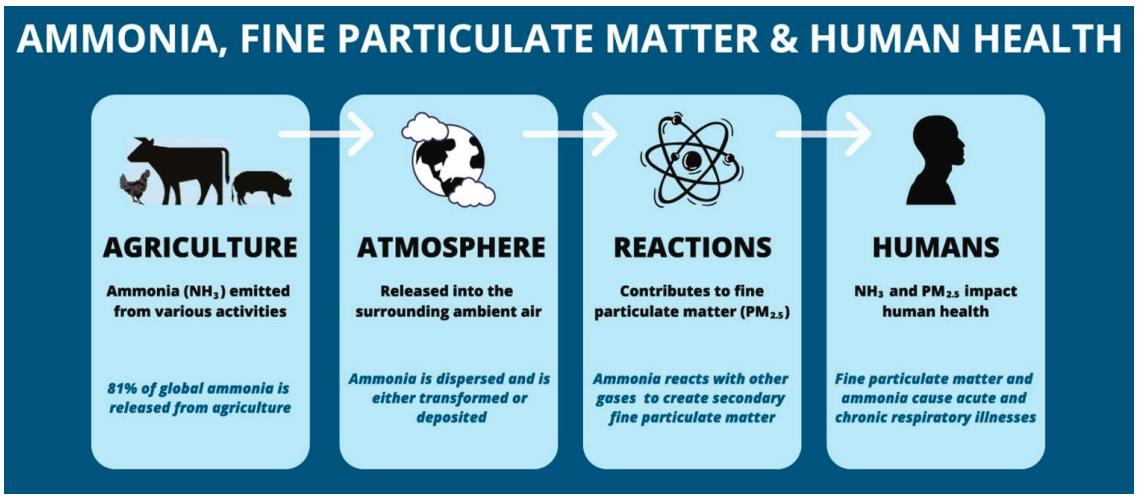


Figure 13. The relationship between ammonia, fine particulate matter and human health.

4.5.5 Air Pollution Trends Report 2023: Critical Load and Critical Level exceedances in the UK[41]

- The Air Pollution Trends Report provides an overview of critical loads for acidity and for nutrient N, deposition data, and exceedance calculations and metrics for habitats across the whole area of the UK. It sets out summaries of trends for specific habitats and countries and also focuses on designated sites, the application of "site relevant critical loads" (SRCL) to these sites, and trends in their exceedances. It also addresses critical levels for ammonia and their exceedances and N deposition onto sensitive habitats, which is the basis of a target in the UK Government's Clean Air Strategy (CAS) (Defra, 2019).

- Information in the UK Trends Report on critical load and level exceedances shows the proportion of protected/designated sites in Northern Ireland at which there are modelled exceedances of Critical Loads for nitrogen (deposition) and Critical Levels of ammonia (atmospheric concentrations), shown in Table 18.

[41] https://uk-air.defra.gov.uk/assets/documents/reports/cat09/2401111009_Air_Pollution_Trends_Report_2023.pdf

Table 18. Proportion of NI sensitive sites exceeding critical levels and loads in 2020[41].

	Sites exceeding critical levels of ammonia concentrations (Cle)		Sites exceeding critical loads for N deposition (Clo)
	>1 µg m^{3*}	>3 µg m^{3**}	
ASSI	100%	12.8%	100%
SAC	100%	14.8%	100%
SPA	98.6%	14.3%	99.5%

*Lichens/bryophytes, **Higher, vascular plants

- Table 18 shows the percentage of sites in Northern Ireland experiencing exceedances of critical levels set for ammonia concentration: 1 µg m^{-3} is the level set for the protection of 'lower' plants such as lichens and bryophytes (for example, mosses); 3 µg m^{-3} is the concentration of ammonia in the air above which direct damage to plant tissue occurs for 'higher' plants (flowering plants).
- Table 18 also shows the percentage of each type of designated/protected site experiencing modelled exceedance of its critical load for nutrient nitrogen.

4.5.6 Total Ammonia Emissions

The most recent summary ammonia emission estimates for Northern Ireland from the National Atmospheric Emissions Inventory are shown in Table 19 below. Emissions of ammonia from agriculture in Northern Ireland were estimated to be 30.86 kt in 2022 and agriculture accounted for 97% of total ammonia emissions in 2022.

Table 19. Summary of ammonia emission estimates (kt) for NI (2005-2022)

Category	2005	2010	2015	2018	2019	2020	2021	2022
Agriculture	28.77	26.80	29.37	30.50	30.88	30.83	31.59	30.86
Total	30.08	27.88	30.31	31.47	31.81	31.80	32.57	31.82

4.5.7 Atmospheric Ammonia Monitoring

A network of 25 ammonia (NH_3) monitoring sites implementing the UKCEH ALPHA® method (ALPHA® network) and 4 reactive gases and aerosols monitoring sites implementing the UKCEH DELTA® method (DELTA® network) was established in spring 2019 across Northern Ireland. The

ALPHA® sites were selected to provide representative coverage of i) the range of modelled concentrations from FRAME (using the most recent 5 km NH_3 emissions data for 2016), (ii) each of seven major dominant emission source classifications: cattle (beef and dairy), pigs & poultry, sheep, mixed, non-agricultural, fertiliser and background (very low emission density, < 1 kg N ha^{-1} yr^{-1}), and (iii) spatial coverage across Northern Ireland. The aims of the measurements were to (i) explore spatial and temporal patterns in NH_3 concentrations, (ii) compare results with the FRAME atmospheric transport model and for verification of UK NAEI emissions inventory and FRAME model, (iii) monitor and assess relationship between NH_3 and interacting gases (HNO_3, SO_2) and inorganic particulate phase composition.

Seasonal pattern observed at the different sites show that NH_3 concentrations are related to emission source categories present locally (e.g. sites grouped according to dominant emission source sectors for the grid square) and by changes in environmental conditions with smallest concentrations in the winter months[42].

During 2022 the 25 sites in the Northern Ireland network described above were added to the National Ammonia Monitoring Network (NAMN), increasing the number of NAMN sites providing monthly measurements of atmospheric NH_3 across the UK from 72 to 98. Figure 14 below shows the location of the NAMN sites added to the network in 2022.

[42] https://nora.nerc.ac.uk/id/eprint/536403/1/N536403CR.pdf

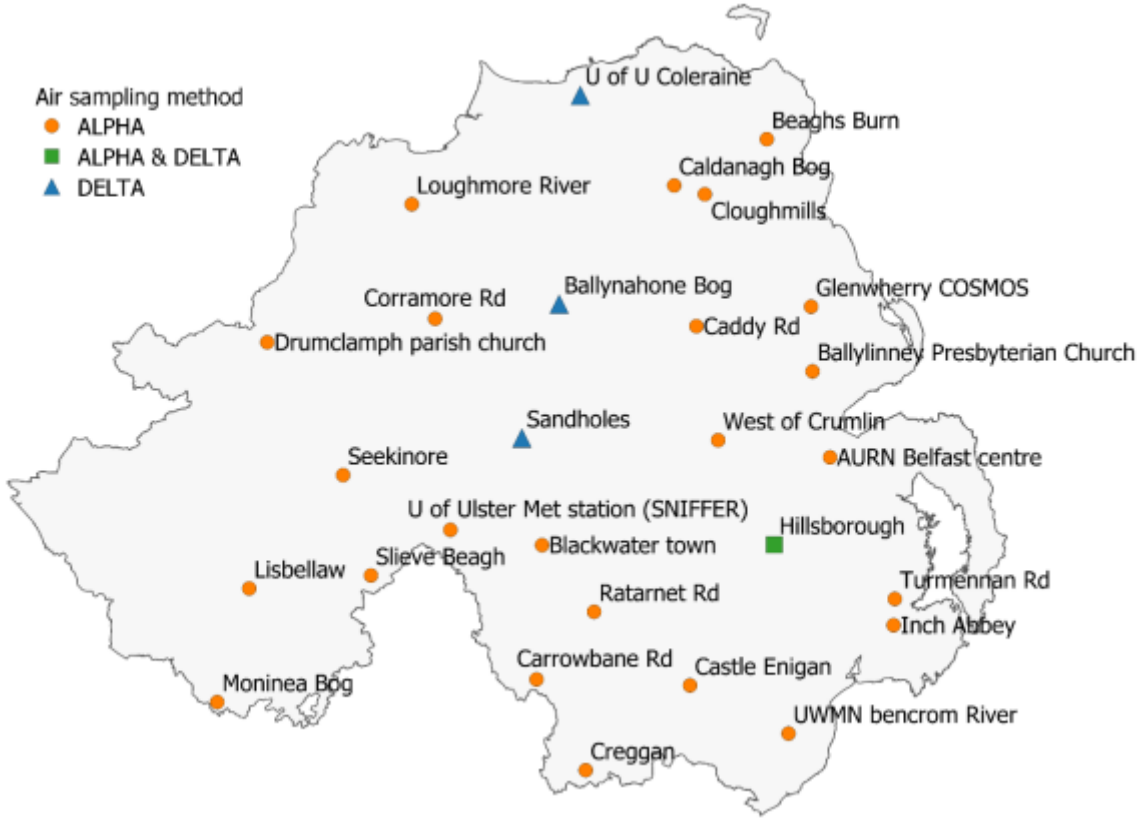


Figure 14. NAMN sites added to the network in Northern Ireland in 2022[42].

The spatial variability of the annual concentration of NH_3 and NH_4^+ are presented in Figure 14. For NH_3, lower concentrations (green markers) are primarily located in the North of Scotland, with some locations in the south coast of England. Similarly NH_4^+ concentrations are lowest in Northern England and Scotland, and highest on the eastern side of England. High ammonia air concentration values are also observed across the south and north-east of Northern Ireland.

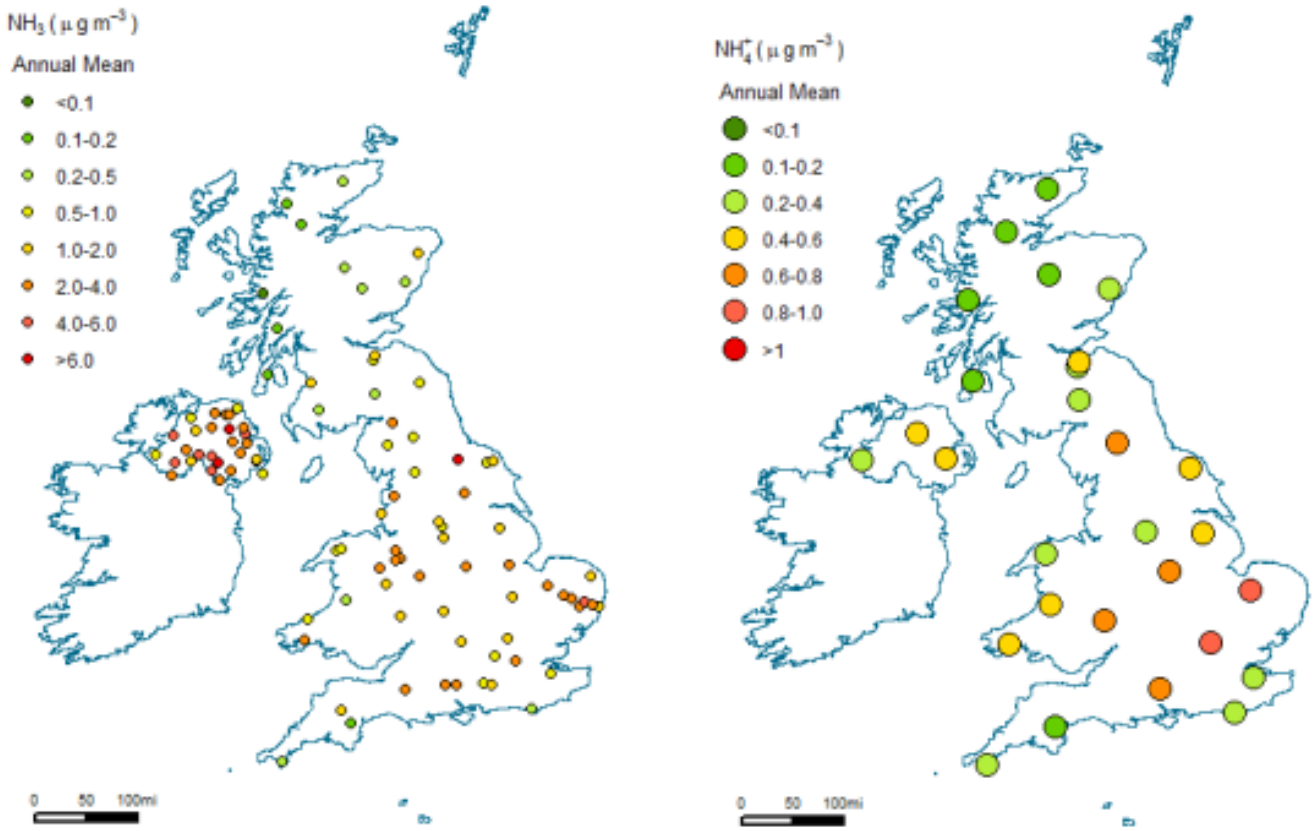


Figure 15. Spatial patterns of annual NH_3 and aerosol NH_4^+ concentrations from monthly NAMN/AGANET measurements. Since February 2017, ammonium is measured at the 27 (28 from April 2022) AGANET sites only[43].

Going forward, the NAMN data for Northern Ireland will provide an annual report of the NH_3 concentrations at the sites and will be used to evaluate the impact of the measures in the Proposed Ammonia Strategy. The current research project for the inclusion of the 25 NI sites in the National Ammonia Monitoring Network is scheduled to end on 31 March 2025 but this will be reviewed, taking into consideration the significance of the network's contribution to informing the delivery of ammonia emissions reductions and ground truthing NH_3 modelling and NAEI data.

[43] https://uk-air.defra.gov.uk/assets/documents/reports/cat09/2309281200_UKEAP_2022_annual_report.pdf

4.5.8 Transboundary Movement of Nitrogen

The amount of atmospheric N produced and deposited within Northern Ireland and imported/exported from outside of NI was estimated using FRAME (Fine Resolution Multi-pollutant Exchange) source attribution modelling output and detailed in the report '2018 Estimates of nitrogen deposition in Northern Ireland and import/export of N deposition across the UK'[44]. The study shows that Northern Ireland exports more atmospheric N deposition to the rest of the UK (7.7 kt N) than it receives (from the UK and elsewhere, 5.4 kt N). The amount of N originating from sources within NI and deposited within NI is mostly from NH_3 emission sources (92%), with only 8% due to NOx emissions.

Box 16. SEA Theme 5

SEA Theme 5 – Air

Key Environmental Issues

- Levels of $PM_{2.5}$ are above WHO guideline levels at 7 of the 8 sites where $PM_{2.5}$ is monitored in Northern Ireland.
- 100% of SACs and ASSIs and 98.6% of SPAs are exceeding their Critical Levels of ammonia concentration.
- 100% of SACs and ASSIs and 99.5% of SPAs are exceeding their Critical Loads for nitrogen deposition.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Increased risk of negative human health outcomes from the direct and indirect effects of ammonia emissions.
- There would continue to be exceedances of the Critical Levels of ammonia and Critical Loads for nitrogen deposition in almost all SACs, SPAs and ASSIs in Northern Ireland.

[44] https://nora.nerc.ac.uk/id/eprint/533592/1/N533592CR.pdf

4.6 SEA Theme 6 - Climatic Factors

4.6.1 Northern Ireland Greenhouse Gas Emissions 2022[45]

In 2022, Northern Ireland's net greenhouse gas emissions were estimated to be 21.3 million tonnes of carbon dioxide equivalent (MtCO2e). This net figure is a result of an estimated 23.2 MtCO2e total emissions, offset by 1.9 MtCO2e of emissions removed through sequestration.

The 2022 figure of 21.3 MtCO2e represents a decrease of 3.0% compared with 2021. The longer-term trend showed a decrease of 26.4% compared with emissions in 1990. The largest sectors in terms of emissions in 2022 were agriculture (29%) and domestic transport (18%), shown alongside contributions from other sectors in Figure 16.

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 20ºC has also been increasing in the same timescale.

Temperature increases will have potential implications for key environmental processes, for example the nutrient transformation processes in the nitrogen cycle.

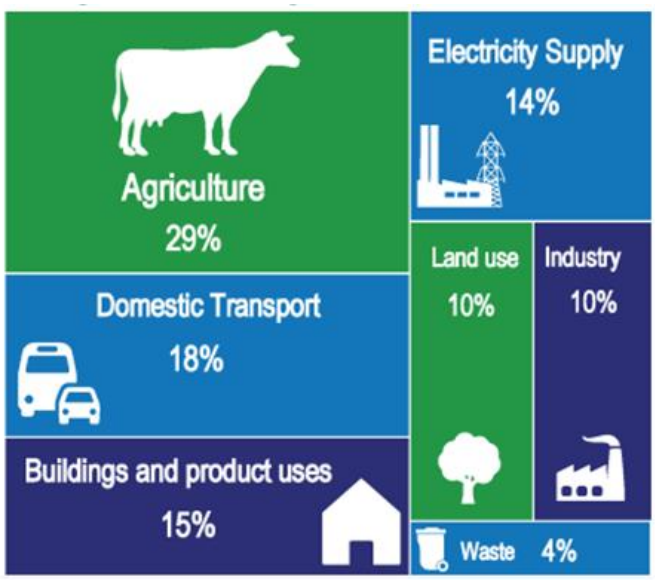


Figure – 16 Northern Ireland Greenhouse emissions by sector in 2022.

[45] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/NI%20Greenhouse%20Gas%20Statistics%201990-2022%20Report.pdf

4.6.2 State of the UK Climate 2023[46]

The State of the UK Climate 2023 report stated that the UK's climate continues to change with recent decades being warmer, wetter and sunnier than during the 20th century. Extremes of temperature in the UK have been affected much more than average temperature and the UK has warmed at a rate consistent with the observed change in global surface air temperature over land.

The most recent decade (2014–2023) has been on average 0.42 ^{0}C warmer than the 1991–2020 average and 1.25 ^{0}C warmer than 1961–1990. This is the warmest 10-year period in both the UK series from 1884 and CET series from 1659. The most recent decade (2014–2023) has had over a week fewer ground frosts per year than the 1991–2020 average and almost a month fewer than 1961–1990.

Five of the 10 wettest years for the UK from 1836 have occurred in the 21st century. The most recent decade (2014–2023) has been 10% wetter than 1961–1990. UK winters for the most recent decade (2014–2023) have been 9% wetter than 1991–2020 and 24% wetter than 1961–1990, with smaller increases in summer and autumn and none in spring.

4.6.3 UK Climate Projections: Headline Findings August 2022[47]

The general UK climate projections for the 21st century in UKCP18 are broadly consistent with earlier projections (UKCP09) showing an increased chance of warmer, wetter, winters and hotter, drier summers along with an increase in the frequency and intensity of extremes. Key projections in the report are:

- By the end of the 21st century, all areas of the UK are projected to be warmer, more so in summer than in winter.
- Hot summers are expected to become more common.
- Future climate change is projected to bring about a change in the seasonality of extremes.
- By the end of the 21st century, lying snow decreases by almost 100% over much of the UK, although smaller decreases are seen over mountainous regions in the north and west.
- The pattern of sea level rise is not uniform across the UK.

Sea level around the UK is projected to continue to rise to 2100 under all emission pathways.

[46] https://rmets.onlinelibrary.wiley.com/doi/epdf/10.1002/joc.8553
[47] https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18_headline_findings_v4_aug22.pdf

4.6.4 Relationship Between Ammonia and Greenhouse Gases

Ammonia is not a greenhouse gas, but it can contribute indirectly to greenhouse gas emissions. After being emitted, ammonia can be redeposited and contribute to eutrophication of waterways and also contribute to the local N pool. Nitrous oxide (N_2O) is a result of the denitrification of nitrate (NO_3^-) and the nitrification of ammonium (NH_4^+) from slurry solids during storage. Subsequently, this increase in N indirectly contributes to N_2O emissions through the nitrification and denitrification processes occurring during storage[48].

4.6.5 UK Climate Change Risk Assessment 2022[49]

The UK Climate Change Risk Assessment (CCRA3) 2022 sets out eight Priority Risk Areas:

Priority Risk Area 1 - Risks to the viability and diversity of terrestrial and freshwater habitats and species from multiple hazards.

Priority Risk Area 2 - Risks to soil health from increased flooding and drought.

Priority Risk Area 3 - Risks to natural carbon stores and sequestration from multiple hazards, leading to increased emissions.

Priority Risk Area 4 - Risks to crops, livestock and commercial trees from multiple climate hazards.

Priority Risk Area 5 - Risks to supply of food, goods and vital services due to climate-related collapse of supply chains and distribution networks.

Priority Risk Area 6 - Risks to people and the economy from climate-related failure of the power system.

Priority Risk Area 7 - Risks to human health, wellbeing and productivity from increased exposure to heat in homes and other buildings.

Priority Risk Area 8 - Multiple risks to the UK from climate change impacts overseas.

[48] Kavanagh et al. (2021) Mitigating ammonia and greenhouse gas emissions from stored cattle slurry using agricultural waste, commercially available products and a chemical acidifier. Journal of Cleaner Production Volume 294, 20 April 2021, 126251
[49] https://assets.publishing.service.gov.uk/media/61e54d8f8fa8f505985ef3c7/climate-change-risk-assessment-2022.pdf

Box 17. SEA Theme 6

SEA Theme 6 – Climatic factors

Key Environmental Issues

- Risks to habitats and species.
- Risks to soil health.
- Risks to carbon stores and sequestration.
- Knock-on effects from risks to livestock, crops and trees.
- Knock-on effects from risks to supply chains.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Increased impact of ammonia as an indirect Greenhouse Gas.
- Increased impact of ammonia and nitrogen deposition on the risks and knock-on effects listed above.

4.7 SEA Theme 7 - Material Assets

4.7.1 Definition of 'Material Assets'

SEA legislation includes 'material assets' as a topic to be addressed in the process of SEA but does not include a definition of the term. The consideration of Material Assets in SEA encompasses a wide variety of assets and resources which can be categorised as built assets and natural assets[50]. Those built and natural assets relevant to a specific SEA require consideration. Material assets to be considered in the context of the Proposed Ammonia Strategy and the Revised Operational Protocol are:

- Built assets subject to consideration under the Revised Operational Protocol to assess the impacts of air pollution on the natural Environment. This arises from DAERA's role as the appropriate nature conservation body in Northern Ireland as set out in The Conservation of Habitats and Species Regulations 2017, Section 5, to provide advice to planning authorities and other competent authorities on the potential impacts of air pollution, including ammonia, from plans and projects on designated sites and protected habitats.

[50] https://www.sepa.org.uk/media/219432/lups-sea-gu4-consideration-of-material-assets-in-sea.pdf

- Natural assets e.g. natural flood management processes, forestry and woodlands, agricultural land and associated elements such as field boundaries (e.g. hedges, stone walls).

4.7.2 Built assets

Built asset proposals considered as a plan or project under the Revised Operational Protocol will include sources of agricultural, industrial, road transport, or other pollutants. Pollutants potentially being released may include ammonia (NH_3), nitrogen oxide (NO_x) or others. Built assets may fall within a range of development proposal categories including new development, replacement of existing facility: 'like for like' with no change in capacity; expansion of an existing facility; or a variation of an environmental permit)[51].

4.7.3 Natural Assets - Natural Flood Management Processes including Peatlands

Flooding in Northern Ireland (NI) in recent years has had significant impacts on communities, businesses, infrastructure and the environment. A changing climate, increasing seasonal and peak rainfall, rising sea levels and more extremes in the weather will lead to more frequent and severe flooding. To manage that risk, it is essential to understand the areas likely to be affected. The Floods Directive requires the establishment of a framework for the assessment and management of flood risk that aims to reduce the adverse consequences of flooding on human health, the environment, cultural heritage and economic activity. This works on a six-year cycle of flood risk assessment, prioritisation, updated flood mapping and planning for flooding. The Water Environment (Floods Directive) Regulations (Northern Ireland) 2009[52] require a Flood Risk Management Plan (FRMP).

The Second Cycle Northern Ireland Flood Risk Management Plan 2021-2027 highlights the flood hazards and risks from rivers, the sea and surface water and sets out how the relevant authorities will work together and with local communities to manage flood risk.

The draft Northern Ireland Peatland Strategy[53] includes flood attenuation and water storage as one of a number of Peatlands Ecosystem Services. The draft strategy states that "Peatlands are valued for their capacity to store, filter and provide water. They reduce the risks of flooding,

[51] https://www.daera-ni.gov.uk/future-operational-protocol-a-call-for-evidence
[52] https://www.infrastructure-ni.gov.uk/articles/2nd-cycle-flood-risk-management-plan-2021-2027
[53] https://www.daera-ni.gov.uk/consultations/ni-peatland-strategy-consultation

serving as a buffer against rapid run off during heavy downpours. They help maintain a consistent supply of clean water to rivers, loughs and reservoirs. Reservoirs that drain areas of blanket bog on the Garron Plateau, the Sperrin Mountains and Mourne Mountains provide much of our drinking water in Northern Ireland. Exposed or dry peat on degraded peatland is more susceptible to erosion and can contribute to high organic content and the supply of poor-quality raw water to reservoirs. This increases costs during the water treatment process to remove colour, turbidity and organic matter from the peat-stained water, which can cause issues in the network as well as taste and odour problems."

4.7.4 Natural Assets - Forestry and Woodland

Woodlands are an important part of our heritage, culture and biodiversity. Native woodland is one that consists of trees, shrubs and associated plants that are considered to be naturally occurring. These woodlands can be classified as oak, mixed ash, wet woodland and lowland wood pasture and parkland.

Woodland currently represents 8.5% of the total land area of Northern Ireland.[54] A map of woodlands in Northern Ireland is shown in Figure 17.[55] The Forests for Our Future strategy was launched in 2020 and envisages the planting of 18 million trees by 2030, creating 9,000 hectares of new woodland.[56]

[54] https://www.forestresearch.gov.uk/climate-change/advice/official-country-guidance/northern-ireland/#:~:text=In%20Northern%20Ireland%2C%20woodland%20area,2022)%20and%20this%20is%20increasing.
[55] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Forest%20and%20Woodland%20Cover%20In%20NI%202022_0.PDF
[56] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/E02922998_Forest%20Service%20Annual%20Report%20%26%20Accounts%202022-23_Accessible.pdf

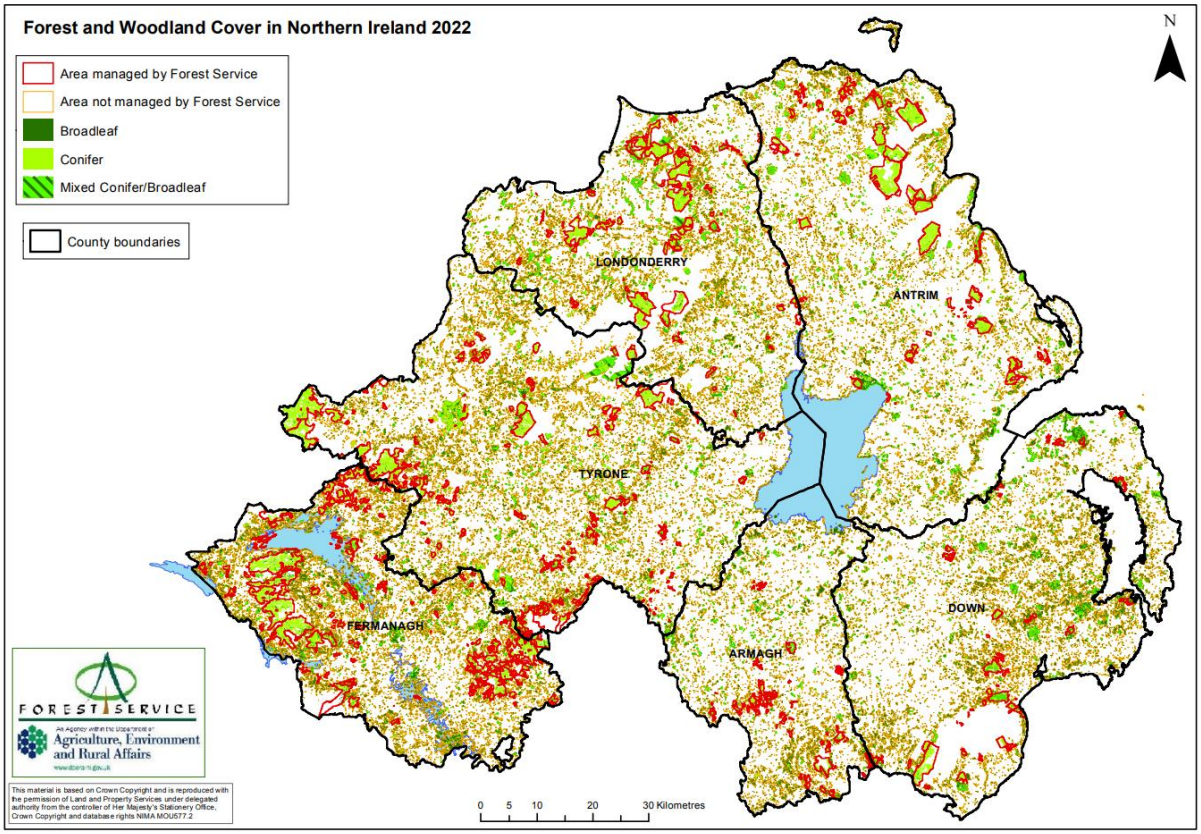


Figure 17 – Forest and Woodland Cover in Northern Ireland 2022.

Ancient, semi-natural woodlands are the most valued part of woodland for nature conservation as the plant and tree species have descended from the original native woodland. These woodlands can contain large trees, known as veterans, that may be several hundreds of years old and can be traced back to the original native woodlands. Species such as pedunculate and sessile oak, along with an understorey of hazel, wych elm and ash are usually present. The wildlife is usually richer than those newer established woods with an abundance of mosses, ferns, lichens and woodland birds[57].

The 2023 State of Nature Northern Ireland report[58] states that ancient woodland is one of Northern Ireland's rarest and most diverse habitats, making up just 0.04% of the landscape. Ammonia emissions in Northern Ireland present a particular threat to remaining fragments of ancient woodland habitat. Many woodland fungi have been shown to be sensitive to nitrogen deposition, and there is particular concern about impacts on ectomycorrhizal species (associated with tree roots), and the subsequent impacts on tree health and associated invertebrate species. The loss of these woodland fungi also results in soil carbon release to the atmosphere, with climate change implications.

[57] https://www.daera-ni.gov.uk/articles/woodlands#:~:text=Ancient%20woodland,-Ancient%2C%20semi%20natural&text=These%20woodlands%20can%20contain%20large,and%20ash%20are%20usually%20present.
[58] https://stateofnature.org.uk/wp-content/uploads/2023/09/TP26055-SoN-N_Ireland-summary-report-v4-1.pdf

4.7.5 Natural Assets - Agricultural Land and Associated Elements

This section focuses on the natural assets associated with agriculture in Northern Ireland including land use; the number, size and types of farms; farm productivity; and associated elements.

4.7.5.1 Natural Assets - Agricultural Land Use

Approximately 77% of the total Northern Ireland land area of 1.35 million hectares is used for agriculture, including common rough grazing[59]. Around 8.7% of the total land area is used for forestry with the greater part (52.8%) of the total forested area (118,000 hectares) managed by DAERA's Forest Service.

The split in the 1.04 million hectares used for agriculture between the areas of total agricultural crops, total horticultural crops, total grass, rough grazing, woods and plantation, and other land in 2022 are shown in Figure 18. The pie chart clearly shows the dominance of grass and rough grazing over other types of agricultural land use, and relatively small area of crops grown.

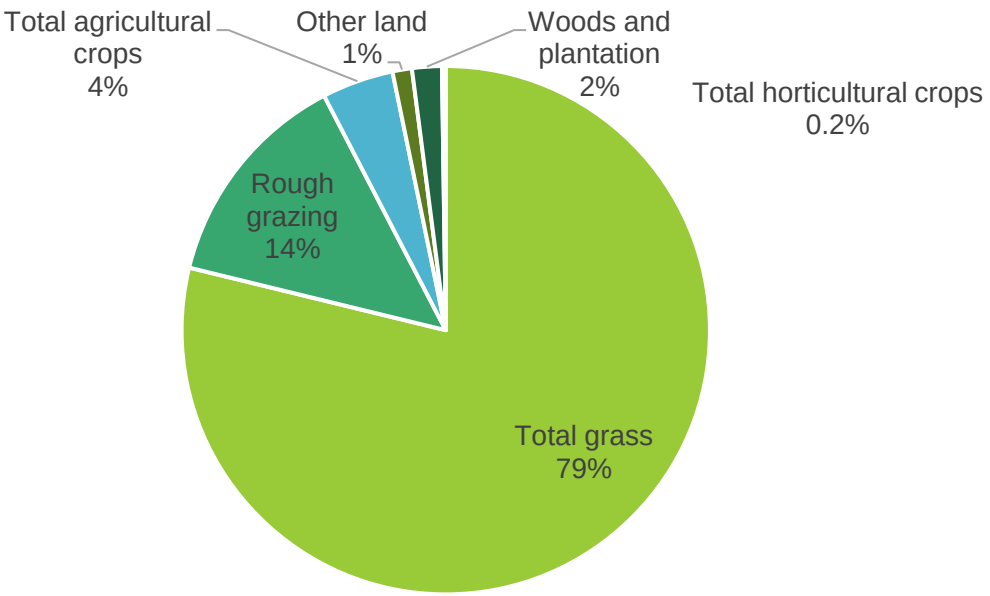


Figure 18 Agricultural land use in Northern Ireland, 2022.

The term Less Favoured Areas (LFA) is used to describe those parts of the country which, because of their relatively poor agricultural conditions, have been so designated under EU

[59] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Stats%20Review%20Internal%20for%202022%20ONLINE.pdf

legislation. Farms classed as LFA farms occupy 69.3% of farmed land in Northern Ireland and livestock farming predominates. Crops occupy 11.8% of land on lowland farms compared with only 1.4% in the case of LFA farms.

There are also significant differences in the patterns of livestock farming. Beef cows (187,000) predominate on LFA farms, where they are more important than dairy cows (157,000). On lowland farms, in contrast, there were just under 60,000 beef cows and 160,000 dairy cows in 2022. LFA farms account for 30 and 62 per cent of the Northern Ireland's pigs and poultry, respectively. The table below sets out the areas of crops, grass, rough grazing and other land by Less Favoured Area (LFA) category of farm, June 2022.

Table 20. Areas of crops, grass, rough grazing and other land by Less Favoured Area (LFA) category of farm, June 2022[60]

thousand hectares

	Areas on farms wholly or mainly in:				
	Severely Disadvantaged Area (SDA)	**Disadvantaged Area (DA)**	**Total LFA**	**Non LFA**	**LFA as % NI**
Cereals	1	5	6	26	19
Potatoes	0	1	1	3	24
Other agricultural crops	1	2	3	7	30
Horticultural crops	0	0	0	2	17
Total crops	**3**	**8**	**10**	**38**	**22**
Grass: Under 5 years old	41	41	83	57	59
5 years and over	275	202	477	206	70
Total grass	**316**	**243**	**559**	**263**	**68**
Rough grazing[2]	128	8	136	5	96
Woods/other land	6	5	10	9	55
Other land	3	3	6	6	49
Total area	**456**	**266**	**722**	**321**	**69**

[60] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Stats%20Review%20Internal%20for%202022%20ONLINE.pdf

4.7.5.2 Number, Size, and Types of Farms in Northern Ireland

The most recent Statistical Review of Northern Ireland Agriculture 2022[61] states that in June 2022 there were 26,089 farms in Northern Ireland with 1,043,270 hectares of land farmed. Around 25 per cent of farms had less than 10 hectares of crops and grass, while 1,541 farms (5.9 per cent) had 100 hectares or more.

The majority of farm businesses in Northern Ireland, 79 per cent in 2022, were classified as **very small**. In 2022, there were 20,506 farms in this category. They contribute 20 per cent of the industry's total standard outputs but account for 48 per cent of the farmed area (Table 21). The main activities of these farms are cattle and sheep rearing. In 2022, 60 per cent of beef cows and 52 per cent of total sheep were to be found on very small farms.

The next category of 2,667 **small** farms make important contributions to all sectors, for example accounting for 23 per cent of poultry and 25 per cent of total sheep activities; they cover 19 per cent of the agricultural area and involve 15 per cent of the full-time agricultural labour force.

The 1,217 **medium** and 1,699 **large** farms (together representing 11 per cent of all farms) contribute 64 per cent of the total standard outputs from approximately one third (33 per cent) of the land area. These farms dominate the dairy, pigs and poultry layer sectors with 86, 95 and 72 per cent shares of the livestock numbers, respectively.

Seventy-three per cent of very small and 66 per cent of small farms are mainly in the Less Favoured Areas whereas, for medium and large farms, the proportions are 59 and 48 per cent, respectively.

The split between different types of farm businesses is shown in table 22 which illustrates that the majority of farm businesses are cattle and sheep with much smaller proportions of other farm business types.

[61] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Stats%20Review%20Internal%20for%202022%20ONLINE.pdf

Table 21. Farm Business Types in Northern Ireland, 2022.

Farm Business Type	%
Dairy farms	9.7
Cattle and sheep	79.2
Cereals / General Cropping / Horticulture	6.4
Specialist pigs and poultry farms	2.7
Mixed and Other	2.0

4.7.5.3 Productivity of Northern Ireland Farms[62]

Productivity measures the efficiency with which businesses turn inputs into outputs, indicating the economic competitiveness of a sector. The main ways of measuring productivity are through the use of total factor productivity and labour productivity.

In 2022 changes in the volumes of outputs and inputs combined to produce a 2.6 per cent rise in total factor productivity (TFP) - the productivity of all resources in the industry.

There were a total of 51,760 farm workers in Northern Ireland in 2022, 78% of which were farmers and partners, and the remaining 22% other workers. The total income from farming which represents the return on own labour, management input and own capital invested for all those with an entrepreneurial involvement in farming (including all members of the family working on farm) increased by 17.4% (11.3% in real terms) from £515 million in 2021 to £605 million in 2022.

The increase in total income from farming from 2021 to 2022 was linked to a 23% increase in the value of gross output however there were significant variations across the different commodities. The value of gross inputs was also 23.8% higher in 2022 and this was mainly attributed to a 22.1% rise in feedstuffs costs, a 101.6% rise in fertiliser costs and a 58.1% increase in machinery fuel costs.

[62] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Stats%20Review%20Internal%20for%202022%20ONLINE.pdf

4.7.5.4 Natural Assets – Associated Elements

The NI Countryside Survey (NICS)[63] has been monitoring long-term change in the countryside since the first survey was carried out in the late 1980's/early 1990's. By periodically re-surveying land using statistically robust, comparable methods, countryside change can be tracked over time. Results of the latest survey are due to published in 2026.

The NI Countryside Survey is based on the NI Land Classification – a multivariate classification of 1km squares in NI, which groups similar squares together on the basis of climate, elevation, topography, vegetation, hydrology, geology, soils and settlement patterns. The survey aims to understand how land use and the environment influence habitats and their biodiversity and how habitats change with time. The NICS provides a science-based record of habitat change that can be used as a measure of the effectiveness of biodiversity conservation and performance on environmental sustainability.

Results of the previous Northern Ireland Countryside Survey 2007: Broad Habitat Change 1998-2007[64] showed that while there was continued seminatural habitat loss compared with 1998, the rate of loss was lower. Agricultural conversion and rural building continued to be the main processes resulting in habitat loss. Scrub/woodland succession in open habitats was greater than in 1998. A trend to a smaller area of arable crops continued and a trend to more broadleaf tree planting on agricultural grassland was recorded. Widespread damage to bogs from peat cutting no longer occurred.

A decrease in area of species-rich dry grassland, driven by scrub/woodland succession and conversion to more productive, less species-diverse agricultural grassland, continued a trend from NICS 1998. A high rate of agricultural conversion and a relative scarcity of high-quality species-rich dry grassland, a habitat dependent on more traditional agricultural systems, suggest that sustaining grassland by conversion to productive agricultural grasslands reported by NICS 1998 was also recorded by NICS 2007 but the loss rate was lower.

The survey reported that a large increase in the area of rural building recorded by NICS 2007 was almost twice that reported by NICS 1998. Building in both surveys was mainly over agricultural

[63] https://www.daera-ni.gov.uk/articles/northern-ireland-countryside-survey
[64] Cooper, A., McCann, T. and Rogers, D. (2009) Northern Ireland Countryside Survey 2007: Broad Habitat Change 1998-2007. Northern Ireland Environment Agency Research and Development Series No. 09/06

grassland, highlighting the issue of agricultural land loss. A wide range of seminatural habitats were recorded by NICS 2007 as built over. The continued loss of seminatural habitat by agricultural conversion and building, particularly in lowland landscapes, where the area of seminatural habitats is small, is a key biodiversity issue.

The survey also reported that an increased rate of scrub/woodland succession recorded by NICS 2007, continued the trend reported by NICS 1998. Succession was associated with species-rich grasslands, agricultural grasslands with management constraints, fragmented heath and bog edge vegetation, leaving these habitats are at risk from succession. Their management is a key lowland habitat biodiversity issue.

Box 18. SEA Theme 7

SEA Theme 7 – Material Assets

Key Environmental Issues

- Impact of ammonia and other pollutants from built assets.
- Impact of ammonia on ecosystem health of material assets including the flood attenuation and water storage capabilities of peatlands.
- Impact of ammonia on ecosystem health of material assets including ancient woodland tree health, associated invertebrate species and release of soil carbon to the atmosphere.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Increase in environmental damage caused by air pollution from built assets.
- Increase in environmental damage caused by air pollution from natural assets eg farming activities.
- Increase in environmental damage caused by air pollution to natural assets eg woodlands, peatlands.
- Increase in environmental damage to natural assets described in the Northern Ireland Countryside Survey, as a result of agricultural conversion and rural building.

SEA Theme 8 – Landscape

4.8 Landscape & Visual Amenity

The landscape of Northern Ireland is a product of land use changes and human interventions that have taken place in the c.9,000 years since the area was first settled by humans. Although population growth in the late 20th and early 21st centuries expanded the extent of built-up areas, the Northern Ireland landscape remains predominantly rural, with agriculture the predominant land use.

The European Landscape Convention (2000)[65], which has been signed and ratified by the UK government, defines landscape as:

"The landscape is part of the land, as perceived by local people or visitors, which evolves through time as a result of being acted upon by natural forces and human beings. "Landscape policy" reflects the public authorities' awareness of the need to frame and implement a policy on landscape. The public is encouraged to take an active part in its protection, conserving and maintaining the heritage value of a particular landscape, in its management, helping to steer changes brought about by economic, social or environmental necessity, and in its planning, particularly for those areas most radically affected by change, such as peri-urban, industrial and coastal areas."

Through the Nature Conservation and Amenity Lands Order (NI) 1985 (NCALO) landscapes in Northern Ireland have been designated as either Areas of Outstanding Natural Beauty (AONB) or National Parks land, with steps taken to manage them for both conservation and recreation.

The purpose of designation is to make sure that policies are created, and action carried out to:

- conserve or enhancing the natural beauty or amenities of that area.
- conserve wildlife, historic objects or natural phenomena within it.
- promote its enjoyment by the public.
- provide or maintain public access to it.[66]

In total 130 Landscape Character Assessments have been carried out,[67] and eight AONBs have been designated:

[65] https://www.coe.int/en/web/landscape/the-european-landscape-convention
[66] https://www.daera-ni.gov.uk/topics/land-and-landscapes/landscapes
[67] https://www.daera-ni.gov.uk/search/type/publication?query=LCA

- Antrim Coast and Glens AONB
- Binevenagh AONB
- Causeway Coast AONB
- Lagan Valley AONB
- Mourne AONB
- Ring Of Gullion AONB
- Sperrin AONB
- Strangford and Lecale AONB

Pressures on landscapes including AONBs in Northern Ireland can include urban expansions and development, housing, agricultural activities, industrial development, wind energy, mineral extraction, transport infrastructure, and the degradation of the natural features, for example through environmental pollution.

Peatlands

In Northern Ireland, peatland can be divided into three broad habitat types: lowland raised bogs, blanket bogs and fens. These cover approximately 12% of the land area of Northern Ireland, while peat soils cover an estimated 18% of NI's land area. Peatlands create distinctive upland and lowland landscapes, support a range of specialised plants and animals and act as a major store of soil carbon. They are a rare and valuable habitat in their own right but can also be considered in terms of Natural Capital and Ecosystem Services, such as flood attenuation covered in Section 4.7.3[68] and climate regulation detailed below.

[68] https://www.daera-ni.gov.uk/sites/default/files/consultations/daera/NI%20Peatland%20Strategy%20-%20Copy%20for%20EQIA%20Consultation.%20%208-8-2022.%20PDF_0.PDF

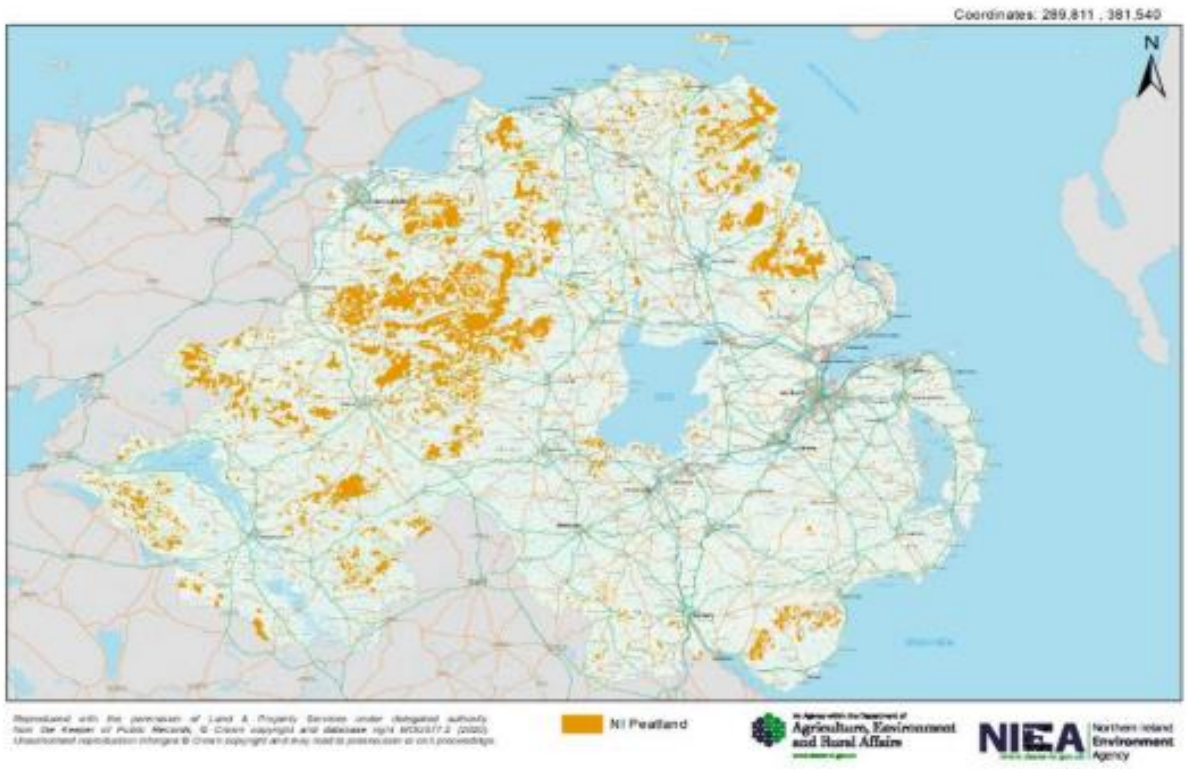


Figure 19 – Peatlands resource in Northern Ireland, NIEA.

The (draft) NI Peatland Strategy 2022-2040 contains a commitment to bringing 150,000 hectares of peatland under restoration/sustainable management by 2050, in line with recommendations of the UK Climate Change Committee.

Climate regulation is one of the most important ecosystem services that peatlands provide, as evidenced by Section 4.4.6.4 UK Climate Change Risk Assessment - Priority Risk Area 3 - Risks to natural carbon stores and sequestration from multiple hazards, leading to increased emissions.

Healthy peatlands sequester atmospheric carbon dioxide, an important “greenhouse” gas, and trap in their soils. However, unhealthy peatlands release carbon dioxide back to the atmosphere, adding to the greenhouse gases which are causing climate change. Key pressures on peatlands include drainage, cutting, overgrazing, burning, scrub encroachment, invasive species, and pollution.

Box 19. SEA Theme 8

SEA Theme 8 – Landscape

Key Environmental Issues

- Pressures on landscapes from a broad range of sources including include urban expansions and development, housing, agricultural activities, industrial development, wind energy, mineral extraction, transport infrastructure, and the degradation of the natural features, for example through environmental pollution.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Increased risk of landscape damage from air pollution, including ammonia, from plans and projects of the types listed above.
- Increased risk of peatland damage from air pollution, including ammonia, from plans and projects of the types listed above, with possible negative consequences in terms of decreased carbon storage and increased carbon emissions.

4.9 SEA Theme 9 - Cultural Heritage including architectural and archaeological heritage

4.9.1 Northern Ireland Environmental Statistics Report 2024 – Historic Environment

The NI Environmental Statistics Report 2024 sets out the numbers of designated heritage assets in Northern Ireland, including those at risk. The historic environment is everything that has been created by people over time. Northern Ireland has a rich heritage of archaeological sites, monuments, buildings, historic landscapes and maritime features that form this environment and represent the aspirations and achievements of past societies, providing evidence of settlement, agricultural, industrial and ritual activity going back to 9,000 years ago. Summary findings from the report were:

In 2022/23, there were a total of 2,035 scheduled historic monuments protected under Article 3 of the Historic Monuments and Archaeological Objects (NI) Order 1995. Overall, there has been a 35% 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 9,072 statutory listings in 2022/23, compared with 8,191 in 2003/04.

Buildings and structures that are classified as 'at risk' in Northern Ireland are recorded on the online Heritage at Risk in Northern Ireland (HARNI) register. In 2022/23, there were 1,037 historic buildings and structures on this database, an increase of 145 compared to 2021/22.

4.9.2 Condition and Management Survey of the Archaeological Resource in Northern Ireland, CAMSAR Report[69]

This Condition and Management Survey of the Archaeological Resource Northern Ireland (CAMSAR) examined the current survival and condition of sites and monuments in Northern Ireland, specifically focussing on sites and monuments earlier than 1700 AD as recorded in the Northern Ireland Sites and Monuments Record. A total of 1500 sites, approximately 10% of the known total at that time, were selected at random from the Northern Ireland Sites and Monuments Record and inspected. Key findings, both positive and negative, are shown in Table 22.

Table 22. Key findings of the CAMSAR Report[18].

Only 7% of the archaeological sites and monuments in the sample were found to be 100% complete or substantially complete.
Sites and monuments located on arable, improved grassland and within urban areas have the worst rates of survival, and are in the poorest condition.
Sites and monuments located on unimproved grassland, within woodland and within wetlands generally survive well and are preserved in a fair, good or excellent condition.
Over 90% of the sites and monuments that have been specially protected through State Care, Scheduling, or Agri-environment agreement can be shown to have survived well.
It was demonstrated that uncontrolled new, built development and certain agricultural activities, particularly heavy grazing and the practice of improving grassland, are the most destructive factors affecting the archaeological resource in Northern Ireland.

[69] CAMSAR: A Condition and Management Survey of the Archaeological Resource for Northern Ireland, NIEA, Belfast, 2009.

Box 20. SEA Theme 9

SEA Theme 9 – Cultural Heritage including architectural and archaeological heritage

Key Environmental Issues

- Risks to condition of archaeological sites and monuments from activities including uncontrolled new, built development and certain agricultural practices.

Likely impact if the Proposed Ammonia Strategy and Revised Operational Protocol are not implemented

- Increased risk of damage to archaeological heritage from plans, projects and certain agricultural practices.

5. Consideration of Alternatives

5.1 The Process

Consideration of alternatives is a key feature of the SEA process. The SEA Directive requires that the Environmental Report should consider: 'Reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme' and give 'an outline of the reasons for selecting the alternatives dealt with' (Article 5.1 and Annex I (h)).

In practical terms, it refers to possible alternatives to the Proposed Ammonia Strategy and Revised Operational Protocol, and the assessment of the impacts of each of these options against the SEA Objectives.

The ODPM Practical Guide to the Strategic Environmental Assessment Directive[70] states that only reasonable, realistic and relevant alternatives need to be put forward, and that it is helpful if they are sufficiently distinct to enable meaningful comparisons to be made of the environmental implications of each.

The assessment of alternatives may be made in broad terms against the SEA objectives, provided there is sufficient detail to identify the significant environmental effects of each alternative. Where appropriate any cumulative, secondary and synergistic, short, medium, and long-term effects need to be highlighted, indicating whether they are likely to be permanent or temporary.

5.2 Consideration of Alternative Policies during Policy Development

The following sections outline the development of the Proposed Ammonia Strategy and Revised Operational Protocol against the strategic outcomes DAERA is seeking to achieve.

[70] https://assets.publishing.service.gov.uk/media/5a78ec0740f0b62b22cbddd2/practicalguidesea.pdf

5.2.1 The Ammonia Strategy - Policy Development and Stakeholder Views

The Draft Ammonia Strategy[71] was published on 4 January 2023 and underwent a 12-week public consultation until 3 March 2023. The Draft Ammonia Strategy proposed the key targets and elements set out in box 21.

Box 21. Key Targets and Elements in the Draft Ammonia Strategy

Key Targets and Elements in the Draft Ammonia Strategy

Key Targets - The long-term target is to reduce ammonia emissions to a point where Critical Loads of nitrogen deposition and Critical Levels of ammonia are not being exceeded at designated sites. Given the generational challenge posed by the scale of current exceedances, interim targets are required. The targets DAERA proposes for 2030 are to:

• Reduce agricultural ammonia emissions from Northern Ireland by at least 30%, based on the 2020 emissions levels (from 31.2 kt in 2020 to 21.8 kt in 2030).

• Reduce ammonia concentrations at all designated sites by at least 40% (using 2020 as the baseline year) or to below Critical Levels.

Key Elements - The Draft Ammonia Strategy stated that a coherent approach to ammonia which can deliver on the targets must include the following elements:

1. An ambitious and verifiable ammonia reduction programme:
 • Implemented on a Northern Ireland-wide basis; and
 • Spatially targeted in areas around designated sites.

2. A strategic programme of conservation, restoration, and management of our most valuable habitats.

Following consultation on the Draft Ammonia Strategy responses provided by stakeholders were taken into consideration and the draft strategy was reworked (see Update on the Proposed Ammonia Strategy). Stakeholder responses were collated into a summary Ammonia Strategy High

[71] https://www.daera-ni.gov.uk/consultations/draft-ammonia-strategy-northern-ireland-consultation

Level Report and a detailed Ammonia Strategy Consultation Report. The Ammonia Strategy High Level Report sets out, for each of the 21 questions asked in the consultation, the outcome and key themes identified in stakeholder responses. The Ammonia Strategy Consultation Report provides a more detailed quantitative and qualitative summary of the responses to each question in the consultation.

5.2.1.1 The Proposed Ammonia Strategy Vision, Objective and Outcomes

An Update on the Proposed Ammonia Strategy has been published alongside this Environmental Report. The vision, objective and outcomes of the Proposed Ammonia Strategy are set out in Box 22.

Box 22. Proposed Ammonia Strategy Vision, Objective and Outcomes

Vision – The vision of the Proposed Ammonia Strategy is:

- To deliver sustained reductions in ammonia to protect nature, meet Northern Ireland's legal obligations, and to ensure a sustainable agri-food sector.

Objective - The objective of the Proposed Ammonia Strategy is:

- To put Northern Ireland agriculture on a pathway to meet the UK National Emissions Ceiling Regulations (NECR) 2018 target for reductions in ammonia emissions by 2030.

Outcomes - The outcomes of the Proposed Ammonia Strategy are:

- To meet the UK's NECR ammonia emission reduction target to 2030.
- Ammonia emissions reduced to a point where critical loads of nitrogen deposition and critical levels of ammonia are not being exceeded at any designated sites (from EIP[2]).

5.2.2 The Revised Operational Protocol – Policy Development and Stakeholder Views

A Call for Evidence on the Future Operational Protocol to assess the Impacts of Air Pollution on the Natural Environment was held from 21 July to 27 October 2023. The Call for Evidence provided stakeholders with an opportunity to submit additional evidence to contribute to the

development and delivery of a scientifically robust, evidence informed, Revised Operational Protocol to protect the natural environment and ensure sustainable development.

Following the Call for Evidence, DAERA reviewed all available evidence relating to the assessment of air quality impacts on designated sites and protected habitats and developed the Revised Operational Protocol to inform DAERA's planning advice and decision-making processes in the assessment of plans and projects.

5.2.2.1 Key proposed objectives – the Revised Operational Protocol

The key proposed objectives of the Revised Operational Protocol are to provide a framework for the assessment of air pollution impacts on the natural environment, which:

- ensures that DAERA is fully complying with legal requirements to protect and conserve the natural environment;
- improves the protection and status of protected sites, such as SACs, SPAs and ASSIs, where there is, or could be a risk of deterioration of site features due to air pollution;
- allows for a degree of flexibility in planning assessments by taking into account local environmental conditions as well as development pressure;
- promotes the consideration of mitigation measures to reduce air pollution emissions or impacts, leading to improved sustainability, particularly in the agricultural sector.

5.3 Governance of Policy Development in DAERA

The DAERA Project Board on Ammonia Reduction meetings took place to discuss and assess policy development, meeting regularly from December 2017 to present. The DAERA Project Board on Ammonia Reduction consisted of the Heads of Group EMFG, FFG, Directors NIEA-NED, NIEA-RED, NEPD, SAFDD, CAFRE, and the Chief Scientific Advisor.

Workstreams were established to contribute to the Project Board's key task of developing and implementing an Action Plan on Ammonia, separately focussed on Policy Development, Science, Knowledge Transfer, the Operational Protocol, and Communication. Workstreams engaged with experts outside DAERA and in other administrations regarding their respective work areas.

5.4 Consideration of Strategic-Level Alternatives via the High-Level Matrix

From a strategic perspective, two alternative scenarios can be considered for the Ammonia Strategy and Operational Protocol:

• **Alternative 1:** The Do-Nothing Approach or continuation of the existing policies for ammonia and the published Operational Protocol (to December 2023) for Northern Ireland, set out in Section 3.A and Section 3.B respectively.

• **Alternative 2:** Implementation of the Proposed Ammonia Strategy and Revised Operational Protocol.

This section provides a comparative evaluation, through use of a High-Level Matrix, of the likely environmental effects of implementing these two strategic level alternatives and determines the likely positive or negative effects in comparison to the Strategic Environmental Objectives set out under each SEO Theme, in Table 24, using the key shown in Table 23.

Table 23. Key for Likely Effects

++	Likely strong beneficial effect
+	Likely beneficial effect
0	Neutral / no effect
-	Likely adverse effect
- -	Likely strong adverse effect
+/-	Uncertain effect

In Table 24 the assessment:
• Plus (+) indicates a potential beneficial environmental effect.
• Minus (-) indicates a potential adverse environmental effect.
• Plus/minus (+/-) will indicate that both beneficial and adverse environmental effects are likely or that, in the absence of further detail, the beneficial effects are unclear or uncertain.

Table 24. High-Level Matrix Analysis of Alternative 1 and 2 against SEOs for each SEA Theme

SEA Theme	Strategic Environmental Objectives	Alternative 1		Alternative 2	
		Existing policy on ammonia – Section 3.A.1	Previous Operational Protocol – Section 3.A.2	Proposed Ammonia Strategy – Section 3.B.1	Revised Operational Protocol – Section 3.B.2
SEA Theme 1 - Biodiversity, fauna and flora	Put NI agriculture on a pathway to meet the UK National Emissions Ceiling Regulations 2030 target for ammonia reductions.	+	-	++	+
	For European site features - agree to plan or project after having ascertained that it will not adversely affect their integrity (SACs, SPAs, Ramsars).	0	-	+	++
	For ASSIs take decisions within the framework of whether a proposal is 'likely to damage'.	0	-	0	++
	Improve Site Condition Assessment status.	+/-	-	+	++
	Reduce number of sites exceeding Critical Loads and Critical Levels.	+/-	-	+	++
	Further the conservation of biodiversity.	+/-	-	+	++
	(EIP) Consider and integrate biodiversity values into all decision-making processes at all levels.	+/-	-	+	++
	(EIP) By 2030: At least 30% of land and freshwater protected, connected and managed for nature.	+/-	-	+	++

SEA Theme	Strategic Environmental Objectives	Alternative 1		Alternative 2	
		Existing policy on ammonia – Section 3.A.1	Previous Operational Protocol – Section 3.A.2	Proposed Ammonia Strategy – Section 3.B.1	Revised Operational Protocol – Section 3.B.2
SEA Theme 2 - Population and human health	Reduced total ammonia emissions leading to less creation of particulate matter, $PM_{2.5}$.	+	-	++	++
	(EIP) Healthy & accessible environment & landscapes everyone can connect with & enjoy.	+	-	++	++

SEA Theme	Strategic Environmental Objectives	Alternative 1		Alternative 2	
		Existing policy on ammonia – Section 3.A.1	Previous Operational Protocol – Section 3.A.2	Proposed Ammonia Strategy – Section 3.B.1	Revised Operational Protocol – Section 3.B.2
SEA Theme 3 – Water	(EIP) By 2030, to have protected our Bathing Waters and Sensitive Areas including Shellfish Water Protected Areas from storm sewage discharges and reduce impacts of agriculture on such areas.	+	-	+	+
	Contribute to maintenance and restoration of hydrology at designated sites by reducing biodiversity loss caused by ammonia and nitrogen deposition.	+/-	-	+	++
	Improvement in status of water bodies under the UK Water Framework Regulation water quality indicators.	+	-	+	+

SEA Theme	Strategic Environmental Objectives	Alternative 1		Alternative 2	
		Existing policy on ammonia – Section 3.A.1	Previous Operational Protocol – Section 3.A.2	Proposed Ammonia Strategy – Section 3.B.1	Revised Operational Protocol – Section 3.B.2
SEA Theme 4 – Soil	Contribute to maintenance and restoration of hydrology at designated sites by reducing biodiversity loss caused by ammonia and nitrogen deposition.	+/-	-	+	++

SEA Theme	Strategic Environmental Objectives	Alternative 1		Alternative 2	
		Existing policy on ammonia – Section 3.A.1	Previous Operational Protocol – Section 3.A.2	Proposed Ammonia Strategy – Section 3.B.1	Revised Operational Protocol – Section 3.B.2
SEA Theme 5 - Air	Reduce the number of designated sites exceeding their Critical Loads and Levels.	+/-	-	+	++
	Reduce potential for $PM_{2.5}$ production by reducing ammonia emissions from agriculture.	+	-	++	+
	Improved local air quality.	+	-	++	++

SEA Theme	Strategic Environmental Objectives	Alternative 1		Alternative 2	
		Existing policy on ammonia – Section 3.A.1	Previous Operational Protocol – Section 3.A.2	Proposed Ammonia Strategy – Section 3.B.1	Revised Operational Protocol – Section 3.B.2
SEA Theme 6 - Climatic factors	(EIP) Net Zero Northern Ireland greenhouse gas emissions by 2050.	+/-	+/-	+	+
	Reduce vulnerability to the effects of climate change e.g. flooding, by contributing to maintenance and restoration of hydrology at designated sites by reducing biodiversity loss caused by ammonia and nitrogen deposition. Maintain healthy peatlands that store and do not emit carbon.	+/-	-	+	++

SEA Theme	Strategic Environmental Objectives	Alternative 1		Alternative 2	
		Existing policy on ammonia – Section 3.A.1	Previous Operational Protocol – Section 3.A.2	Proposed Ammonia Strategy – Section 3.B.1	Revised Operational Protocol – Section 3.B.2
SEA Theme 7 - Material Assets	(EIP) Sustainable management and efficient use of natural resources including water & soils.	+	-	++	++
	(EIP) Introduce Phosphorus and Nitrogen Balance targets for the NI agricultural sector.	0	-	0	0
	(EIP) Improve quantity, quality & accessibility of existing natural spaces, parks, recreational routes and marine & freshwaters.	+	-	+	++
	(EIP) Enhance our evidence on the extent, condition, functioning and connectivity of NI ecosystems, using a range of earth observation, survey methodologies and land cover assessments.	0	-	+	++
	(EIP) An industry that is environmentally responsible, efficient, adaptable, responsive and resilient in times of crisis and uses knowledge and evidence as primary tools to deliver sustained success.	+	-	++	++

SEA Theme	Strategic Environmental Objectives	Alternative 1		Alternative 2	
		Existing policy on ammonia – Section 3.A.1	Previous Operational Protocol – Section 3.A.2	Proposed Ammonia Strategy – Section 3.B.1	Revised Operational Protocol – Section 3.B.2
SEA Theme 8 – Landscape	(SR) Contribute to protection and enhancement of the landscape in designated areas by reducing damage caused by ammonia emissions and nitrogen deposition.	+/-	-	+	++
	(EIP) All semi-natural peatlands are conserved or restored to healthy, functioning ecosystems by 2040.	0	-	0	++

SEA Theme	Strategic Environmental Objectives	Alternative 1		Alternative 2	
		Existing policy on ammonia – Section 3.A.1	Previous Operational Protocol – Section 3.A.2	Proposed Ammonia Strategy – Section 3.B.1	Revised Operational Protocol – Section 3.B.2
SEA Theme 9 - Cultural heritage including architectural and archaeological heritage	(SR) Contribute to protection and enhancement of the landscape in designated areas by reducing damage caused by ammonia emissions and nitrogen deposition.	+/-	-	+	++
	(EIP) Integrate marine and aquatic historic environment considerations into all decision-making processes and assessments of environmental impacts.	+	-	+	++

5.4.1 High Level Matrix - Analysis of Alternatives 1 and 2 against the SEOs

Table 25 sets out the High-Level Matrix analysis of Alternative 1 and 2 against the Strategic Environmental Objectives, with separate consideration given to the Ammonia Strategy and Operational Protocol due to their different objectives. The outcome of the analysis is summarised in Table 25 across each of the nine SEA Themes, to show the distribution of the allocation of the likely beneficial and adverse effects.

Table 25. Summary of High-Level Analysis of Alternative 1 and 2 against the SEA Themes and Strategic Environmental Objectives (AS = Ammonia Strategy, OP = Operational Protocol).

SEA Theme	Likely effects	++	+	0	-	--	+/-
Theme 1 -	Alt 1- AS		1	2			5
	Alt 1- OP				7		
	Alt 2- AS	1	6	1			
	Alt 2- OP	7	1				
Theme 2 -	Alt 1- AS		2				
	Alt 1- OP				2		
	Alt 2- AS	2					
	Alt 2- OP	2					
Theme 3 -	Alt 1- AS		2				1
	Alt 1- OP				3		
	Alt 2- AS		3				
	Alt 2- OP	1	2				
Theme 4 -	Alt 1- AS						1
	Alt 1- OP				1		
	Alt 2- AS		1				
	Alt 2- OP	1					
Theme 5 -	Alt 1- AS		2				1
	Alt 1- OP				3		
	Alt 2- AS	2	1				
	Alt 2- OP	2	1				
Theme 6 -	Alt 1- AS						2

	Alt 1- OP				1		1
	Alt 2- AS		2				
	Alt 2- OP	1	1				
Theme 7 -	Alt 1- AS		3	2			
	Alt 1- OP				5		
	Alt 2- AS	2	2	1			
	Alt 2- OP	4		1			
Theme 8 -	Alt 1- AS			1			1
	Alt 1- OP				2		
	Alt 2- AS		1	1			
	Alt 2- OP	2					
Theme 9 -	Alt 1- AS		1				1
	Alt 1- OP				2		
	Alt 2- AS		2				
	Alt 2- OP	2					

From a quantitative perspective, analysis of the alternatives shows more likely beneficial effects arising from Alternative 2 than Alternative 1, across all of the Themes. When Alternative 1 and 2 are compared for the Ammonia Strategy only, or for the Operational Protocol only, we can see the same pattern of Alternative 2 having more likely beneficial effects in this analysis.

In the Do-Nothing Scenario there will be no strategic pathway for agriculture in Northern Ireland to contribute to deliver DAERA's legal obligations to reduce emissions and protect habitats. The Do-Nothing Scenario will not put Northern Ireland on a pathway to contributing to the National Emissions Ceiling Regulations (2018) reductions in ammonia emissions by 2030. The Do-Nothing Scenario will also not provide a pathway to deliver reductions in the levels of exceedance of ammonia at designated sites and priority habitats in Northern Ireland required under key environmental legislation.

Under the Operational Protocol, the levels of exceedance of ammonia at designated sites, and the presence or absence of a strategic approach to deliver site Conservation Objectives, must be taken into consideration in the assessment of projects, and the issue of advice/decisions following the assessment process. This advice is provided to planning authorities and other competent authorities on the potential impacts of air pollution, including ammonia, from plans and projects on designated sites and protected habitats, by DAERA, in its role as the appropriate nature

conservation body in Northern Ireland. In the absence of a strategic pathway to deliver site Conservation Objectives in a Do-Nothing Scenario, the advice/decisions issued following assessment under the Operational Protocol will reflect this absence.

In the absence of a strategic approach to reducing ammonia emissions in Northern Ireland through the application of the Ammonia Strategy, significant opportunities for likely environmental benefit will be missed, opportunities to reduce nitrogen losses and thus reduce industry production costs, will also be lost, and the overall journey towards sustainability for the agriculture industry in Northern Ireland will be delayed and adversely impacted.

In summary the Alternative 1 Do-Nothing scenario has a much lower capacity to realise likely beneficial effects in respect of the Strategic Environmental Themes and Objectives than Alternative 2. Alternative 1 will only realise likely beneficial effects in 6 Themes whereas Alternative 2 will realise likely beneficial effects across all Strategic Environmental Themes and Objectives. The degree of likely beneficial effects is also much greater for Alternative 2.

5.4.2 Consideration of Cumulative, Secondary or Synergistic Effects During Assessment of Alternatives

The process of Strategic Environmental Assessment is an effective mechanism to identify and address the potential for environmental problems arising as a result of an accumulation of multiple small and often indirect effects, rather than a few large and obvious ones[69]. Examples include changes in the landscape, loss of heathland and wetland, and climate change. These effects are hard to deal with on a project-by-project basis through Environmental Impact Assessment, but the SEA process provides an effective mechanism to consider them.

During the SEA process of assessment of alternatives, any cumulative, secondary and synergistic, short, medium, and long-term effects need to be highlighted, indicating whether they are likely to be permanent or temporary[72]. Table 27 sets out what is meant by each of these terms. The analysis of Alternative 1 and 2 in relation to each of these effects and is taken from ‘A Practical Guide to the Strategic Environmental Assessment Directive[69]‘.

[72] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/bm-sea-practicalguide.pdf

Table 26. Additional effects to be considered during assessment of alternatives.

Cumulative effects arise, for instance, where several developments each have insignificant effects but together have a significant effect, or where several individual effects of the plan (e.g. noise, dust and visual) have a combined effect.
Secondary or indirect effects are effects that are not a direct result of the plan, but occur away from the original effect or as a result of a complex pathway. Examples of secondary effects are a development that changes a water table and thus affects the ecology of a nearby wetland; and construction of one project that facilitates or attracts other developments.
Synergistic effects interact to produce a total effect greater than the sum of the individual effects. Synergistic effects often happen as habitats, resources or human communities get close to capacity. For instance a wildlife habitat can become progressively fragmented with limited effects on a particular species until the last fragmentation makes the areas too small to support the species at all.
Short, medium, and long-term effects

Cumulative effects – Alternative 1 has the potential to lead to negative cumulative effects as the existing ammonia measures in the NAP (2019-2022) were not specifically designed to deliver reductions in ammonia emissions to meet the National Emissions Ceiling Regulations 2030 reduction target. The NAP measures on ammonia are focussed on Low Emission Slurry Spreading and the covering of new above ground slurry tanks. The previous Operational Protocol which was replaced with the interim approach used by NIEA since 19 December 2023 did not reflect the increased body of scientific evidence on the impacts of air pollution on designated habitats and protected sites since 2012. Therefore Alternative 1 presents the potential for negative cumulative effects in comparison with Alternative 2.

Secondary effects – Under Alternative 1 there is potential for negative secondary effects arising from the previous Operational Protocol not reflecting the increased body of scientific evidence on the impacts of air pollution on designated habitats and protected sites since 2012. An example of a negative secondary effect is the potential for irreparable damage to be done to designated sites subject to exemptions under the Revised Operational Protocol. These exemptions include:

- 'Clean' or 'pristine' sites (i.e., those with very low existing levels of air pollution) where there is reason to doubt the improving background trend.
- Sites with sensitive epiphytic or epilithic components that are, or form an important part of, a qualifying feature of the site and which are at or just below their Critical Load/Level.
- Sites with an existing exceedance of Critical Loads/Levels where there is evidence of an impending risk of extinction (due to air pollution) of a species that forms an important part of a qualifying feature.

Synergistic effects – Under Alternative 1 there is potential for negative synergistic effects arising for the same reasons as those set out in respect of secondary effects above.

Short, medium, and long-term effects – Alternative 2 presents an Ammonia Strategy with ammonia emission reduction targets to 2030, in line with the National Emissions Ceiling Regulations target, along with an Operational Protocol that reflects the current body of scientific evidence and case law. Alternative 2 is designed to deliver impacts in the short, medium and long-term.

5.5 Chosen Alternative

The chosen alternative is **Alternative 2: Implementation of the Proposed Ammonia Strategy and Revised Operational Protocol.** This alternative, from the assessment carried out, provides both likely strong beneficial effects or likely beneficial effects on a long-term basis across all of the Strategic Environmental Objectives, and avoids the potential cumulative, secondary and synergistic effects set out at 5.4.2

6. Environmental Assessment of Impacts of the Proposed Ammonia Strategy and Revised Operational Protocol

The purpose of this section of the Environmental Report is to predict and evaluate as far as possible the likely significant environmental effects of implementing Alternative 2 – the Proposed Ammonia Strategy and the Revised Operational Protocol, and to set out measures to prevent, reduce, and as far as possible offset any significant adverse effects on the environment.

The prediction and evaluation of likely significant environmental effects is to include:

• Effects identified include the types listed in the Directive (biodiversity, population, human health, fauna, flora, soil, water, air, climate factors, material assets, cultural heritage and landscape), as relevant; other likely environmental effects are also covered, as appropriate.

• Both positive and negative effects are considered, and the duration of effects (short, medium or long-term) is addressed.

• Likely secondary, cumulative and synergistic effects are identified where practicable.

• Inter-relationships between effects are considered where practicable.

• The prediction and evaluation of effects makes use of relevant accepted standards, regulations, and thresholds.

• Methods used to evaluate the effects are described.

6.1 Detailed Matrix Assessment of the Proposed Ammonia Strategy and Revised Operational Protocol

The second step of the assessment process, following application of the High-Level Matrix to consider alternatives in Section 5, is used to scrutinise the potential adverse or uncertain effects that have been identified by the high-level assessment. Each Policy Area/Theme identified as having potentially adverse or uncertain effects is analysed against each of the SEA Objectives in more detail.

The Proposed Ammonia Strategy has been divided into two sections for the purposes of this assessment: the proposed mandatory measures, and the voluntary measures. The Revised

Operational Protocol is considered in terms of the provision of advice to planning authorities and other competent authorities; and the consideration of air quality impacts on designated sites from intensive agricultural and industrial activities requiring a Pollution Prevention and Control (PPC) permit.

Note: that the mandatory measures presented below are to be implemented through the Nutrients Action Programme, subject to public consultation.

Table 27. Key for Likely Effects

++	Likely strong beneficial effect
+	Likely beneficial effect
0	Neutral / no effect
-	Likely adverse effect
- -	Likely strong adverse effect
+/-	Uncertain effect

In Table 28 the assessment:

• Plus (+) indicates a potential beneficial environmental effect.

• Minus (-) indicates a potential adverse environmental effect.

• Plus/minus (+/-) will indicate that both beneficial and adverse environmental effects are likely or that, in the absence of further detail, the beneficial effects are unclear or uncertain.

Table 28 – Proposed Ammonia Strategy – Proposed Mandatory Measures (1. Low Emissions Slurry Spreading Equipment (LESSE) 2. Move to Stabilised Urea Fertiliser)

SEA Theme	Rating	Description
SEA Theme 1 - Biodiversity, fauna and flora	**++**	The measures will reduce emissions of ammonia from manure spreading and application of fertiliser. Lower levels of ammonia will mean that overall plant health improves, which is positive for biodiversity. There will also be lower levels of nitrogen deposition from ammonia, which will mean that there are fewer adverse effects on species composition at sensitive, protected sites. Sites whose status is poor or at risk, due fully or partly to ammonia/nitrogen deposition will see an improvement in site

		condition status. Sites in good condition will be protected from deterioration.
SEA Theme 2 - Population and human health	**++**	The measures will reduce emissions of ammonia from manure spreading and application of fertiliser. Lower levels of ammonia will lead to reduced formation of particulate matter $PM_{2.5}$, which will lead to improved air quality and better health outcomes for the general population.
SEA Theme 3 – Water	**+**	There will be an improvement in the status of water bodies designated under the Water Framework Directive, due to decreased nitrogen deposition. In addition, low emissions spreading techniques should incorporate nutrients better into soils, leading to reduced nutrient runoff to water bodies. Improved health of peatlands should lead to maintenance and restoration of hydrology, with positive impacts on adjacent water bodies.
SEA Theme 4 – Soil	**+**	For soils at protected sensitive sites in particular, reduced ammonia emissions and nitrogen deposition will help to maintain natural soil characteristics, supporting species diversity and plant health. The use of protected urea fertiliser has not been shown to have any clear impacts on soil health, instead guaranteeing plants' sustained nutrition throughout the growth cycle by releasing nitrogen at a controlled rate.
SEA Theme 5 - Air	**++**	The measures will reduce emissions of ammonia from manure spreading and application of fertiliser. Lower levels of ammonia will lead to reduced formation of particulate matter $PM_{2.5}$, which will lead to improved air quality and better health outcomes for the general population.
SEA Theme 6 - Climatic factors	**0**	Reducing emissions of ammonia from slurry application means that more nitrogen will be incorporated into soils, which could in turn lead to increased emissions of nitrous oxide.

		However, this is uncertain, because increased nitrogen could lead to increased uptake by plants. Soil nutrient analysis and precision nutrient management should further ensure that excess nitrogen exceeding any levels for optimal plant growth and uptake should be minimised. Reducing levels and emissions of ammonia will improve the status and health of peatlands, which are invaluable carbon sinks, and help to prevent their deterioration and transformation into sources of carbon emissions.
SEA Theme 7 - Material Assets	**++**	Protected sites – especially peatlands – are a valuable natural asset whose condition will be protected and improved by reducing ammonia emissions and nitrogen deposition. In addition, the status of water bodies will improve.
SEA Theme 8 – Landscape	**++**	Protection and enhancement of sensitive sites such as peatlands and species-rich grasslands will conserve and add value to Northern Ireland's natural landscape.
SEA Theme 9 - Cultural heritage including architectural and archaeological heritage	**+**	Protection and improvement of sensitive sites and of landscape will complement the preservation of Northern Ireland's cultural heritage.

Table 29 – Proposed Ammonia Strategy – Voluntary Measures (1. Low Emission Livestock Housing 2. Emerging Technologies 3. Longer Grazing Seasons 4. Reducing Crude Protein in Livestock Diets 5. Improving Feed Efficiency Through Genetic Improvement 6. Establishing Tree Plantations around Livestock Housing 7. Covering Above Ground Slurry Stores)

SEA Theme	Rating	Description
SEA Theme 1 - Biodiversity,	**++**	The measures (apart from Measure 6) all aim to reduce emissions of ammonia from manure (production, storage and

fauna and flora		handling). Lower levels of ammonia will mean that overall plant health improves, which is positive for biodiversity. There will also be lower levels of nitrogen deposition from ammonia, which will mean that there are fewer adverse effects on species composition at sensitive, protected sites. Sites whose status is poor or at risk, due fully or partly to ammonia/nitrogen deposition will see an improvement in site condition status. Sites in good condition will be protected from deterioration. Measure 6 (Tree Plantations) requires site-specific consideration as it has the potential to have negative impacts on, for example, soil hydrology near peatlands; however, this measure would not be adopted without taking site-specific considerations into account.
SEA Theme 2 - Population and human health	**++**	The measures will reduce emissions/levels of ammonia from slurry spreading and application of fertiliser. Lower levels of ammonia will lead to reduced formation of particulate matter $PM_{2.5}$, which will lead to improved air quality and better health outcomes for the general population.
SEA Theme 3 – Water	**+**	There will be an improvement in the status of water bodies designated under the Water Framework Directive, due to decreased nitrogen deposition. In addition, low emissions spreading techniques should incorporate nutrients better into soils, leading to reduced nutrient runoff to water bodies. Improved health of peatlands should lead to maintenance and restoration of hydrology, with positive impacts on adjacent water bodies. Measure 3 (Longer Grazing Seasons) – there could be benefits from a smaller proportion of the total manure being intensively spread as slurry, after storage from housing. Measure 6 (Tree Plantations) requires site-specific consideration as it has the potential to have negative impacts on, for example, soil hydrology near peatlands; however, this measure would not be adopted without taking site-specific considerations into

		account. As a mitigation measure, this should be considered at the planning consent stage, when wider environmental factors can be taken into account.
SEA Theme 4 – Soil	**+**	For soils at protected sensitive sites in particular, reduced ammonia emissions and nitrogen deposition will help to maintain natural soil characteristics, supporting species diversity and plant health. Measure 3 (Longer grazing seasons) has the potential to have some negative impacts on soil health, through soil poaching. Soil health could benefit from a smaller proportion of the total manure being intensively spread as slurry, after storage from housing. Measure 6 (Tree Plantations) requires site-specific consideration as it has the potential to have negative impacts on, for example, soil hydrology near peatlands; however, this measure would not be adopted without taking site-specific considerations into account. This measure also has the potential for positive impacts due to increased resilience against soil erosion.
SEA Theme 5 - Air	**++**	The measures will reduce emissions/levels of ammonia from manure spreading and application of fertiliser. Lower levels of ammonia will lead to reduced formation of particulate matter $PM_{2.5}$, which will lead to improved air quality and better health outcomes for the general population.
SEA Theme 6 - Climatic factors	**+**	Reducing emissions of ammonia from slurry application means that more nitrogen will be incorporated into soils, which could in turn lead to increased emissions of nitrous oxide. However, this is uncertain, because increased nitrogen could lead to increased uptake by plants. Soil nutrient analysis and precision nutrient management should further ensure that excess nitrogen exceeding any levels for optimal plant growth and uptake should be minimised.

		Measure 6 (Tree Plantations) has the potential to have a positive impact on climatic factors by absorbing carbon as well as guarding against soil erosion and boosting flood defence. Reducing levels and emissions of ammonia will improve the status and health of peatlands, which are invaluable carbon sinks, and help to prevent their deterioration and transformation into sources of carbon emissions.
SEA Theme 7 - Material Assets	**++**	Protected sites – especially peatlands – are a valuable natural asset whose condition will be protected and improved by reducing ammonia emissions and nitrogen deposition. In addition, the status of water bodies could potentially improve. Measure 6 (Tree Plantations) requires site-specific consideration as it has the potential to have negative impacts on, for example, soil hydrology near peatlands; however, this measure would not be adopted without taking site-specific considerations into account.
SEA Theme 8 – Landscape	**+**	Protection and enhancement of sensitive sites such as peatlands and species-rich grasslands will conserve and add value to Northern Ireland's natural landscape. Measure 6 (Tree Plantations) has the potential to change landscape characteristics. Whether this is a positive or negative effect depends on site-specific characteristics.
SEA Theme 9 - Cultural heritage including architectural and archaeological heritage	**+**	Protection and improvement of sensitive sites and of landscape will complement the preservation of Northern Ireland's cultural heritage.

Table 30 – Revised Operational Protocol

SEA Theme	Rating	Description
SEA Theme 1 - Biodiversity, fauna and flora	**++**	The revised OP will ensure ammonia emissions from consents, permissions, and other authorisations do not have significant effects on designated sites
SEA Theme 2 - Population and human health	**+**	The revised OP will ensure ammonia emissions form consents, permissions, and other authorisations do not have significant effects on designated sites. This may assist in reducing levels of ammonia in ambient air overall, which would lead to reduced formation of particulate matter $PM_{2.5}$ resulting improved air quality and better health outcomes for the general population.
SEA Theme 3 – Water	**+**	The revised OP will assist in reducing overall ammonia emissions from manure handling and spreading and will ensure ammonia emissions from consents permission and other authorisations do not have significant effects on designated sites. This should contribute to an improvement in the status of water bodies designated under the Water Framework Directive, due to decreased nitrogen deposition. Improved health of peatlands should lead to maintenance and restoration of hydrology, with positive impacts on adjacent water bodies.
SEA Theme 4 – Soil	**++**	The revised OP will assist in reducing ammonia emissions from manure handling and spreading, and the application of fertiliser in the vicinity of protected sites. For soils at protected sensitive sites in particular, reduced ammonia emissions and nitrogen deposition will help to maintain natural soil characteristics, supporting species diversity and plant health.
SEA Theme 5 - Air	**+**	The revised OP will assist in reducing overall ammonia emissions from manure handling and spreading and will ensure ammonia emissions from consents permission and other

		authorisations do not have significant effects on designated sites. This may assist in reducing levels of ammonia in ambient air overall, which would lead to reduced formation of particulate matter $PM_{2.5}$ resulting improved air quality.
SEA Theme 6 - Climatic factors	**++**	The revised OP will assist in reducing ammonia emissions from manure handling and spreading, and the application of fertiliser in the vicinity of protected sites such as peatlands. Improving the health of peatlands will help them to continue to act as invaluable carbon sinks and prevent their deterioration and transformation into sources of carbon emissions.
SEA Theme 7 - Material Assets	**++**	Protected sites – especially peatlands – are a valuable natural asset whose condition will be protected and improved by the revised OP. In addition, the status of water bodies will improve.
SEA Theme 8 – Landscape	**++**	Protection and enhancement of sensitive sites such as peatlands and species-rich grasslands will conserve and add value to Northern Ireland's natural landscape.
SEA Theme 9 - Cultural heritage including architectural and archaeological heritage	**+**	Protection and improvement of sensitive sites and of landscape will complement the preservation of Northern Ireland's cultural heritage.

7. Mitigation and Recommendations

Introduction

Annex 1 of the SEA Directive requires the Environmental Report to set out “the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme”. This chapter therefore sets out mitigation measures appropriate to minimising the adverse effects identified in Chapter 6.

The potential adverse effect identified in Chapter 6 is in relation to the Proposed Ammonia Strategy are as follows:

- The potential for to increased emissions of nitrous oxide set out in Table 29 under Climatic Factors.
- Measure 3: longer grazing season, with potential adverse effects on soil health.
- Measure 6: tree plantations, with potential adverse effects on soil health, hydrology (especially in relation to peatlands), biodiversity, protected site status, and landscape characteristics.

7.1 Environmental Enhancements

The Proposed Ammonia Strategy and the Revised Operational Protocol have both been designed specifically for environmental improvement and safeguarding the condition of protected sites in Northern Ireland’s natural environment. They are designed to lessen the levels and impacts of ammonia pollution on the natural environment. Environmental enhancements are broad-ranging and evident for all SEA topics considered for both the Proposed Ammonia Strategy and the Revised Operational Protocol.

7.3 Minimising Adverse Effects

- In general: increased levels of slurry nitrogen being incorporated into soils and potential increases in emissions of nitrous oxide
    - Mitigation: Soil nutrient analysis and precision nutrient management should ensure that excess nitrogen exceeding any levels for optimal plant growth and uptake should be minimised.
- Measure 3: extended grazing season and impacts on soil health.

    - Advice is given by CAFRE on best practice measures for grazing management, and this includes potential impacts on soil from longer grazing periods.
- Measure 6: tree planting and potential impacts on soil, hydrology, biodiversity, protected site status, and landscape characteristics.
    - As a potential abatement measure, tree planting requires site-specific consideration and this would be considered at the planning application stage, when wider environmental considerations can be taken into account, and the appropriateness of the measure can be considered. A tool is being developed by the Centre for Ecology and Hydrology called ‘Farm Trees To Air’ to assist in the planning of tree plantations for ammonia emissions recapture.

7.4 Residual Effects of the Policy

The Proposed Ammonia Strategy and Revised Operational Protocol will deliver reductions in agricultural ammonia emissions and protection of the natural environment while supporting environmentally sustainable agriculture.

The Proposed Ammonia Strategy and Revised Operational Protocol are effective sets of interventions that can deliver real improvements in the quality of the environment and thereby: improve the health and well-being of all who live and work here; create opportunities to develop our economy; elevate Northern Ireland to an environmental leader; and enable Northern Ireland to play its part in protecting the global environment for many decades to come.

8. Monitoring

8.1 Monitoring Indicator 1 - Total ammonia emissions in Northern Ireland

The most recent summary ammonia emission estimates for Northern Ireland from the Air Pollutant Inventories for England, Scotland, Wales and Northern Ireland: 2005-2022[73], are shown in Table 31.

Table 31. Summary of ammonia emission estimates for Northern Ireland (2005-2022)

Table 29 - Summary of air pollutant emission estimates for Northern Ireland (2005-2022) *

	Category	2005	2010	2015	2018	2019	2020	2021	2022
Ammonia (kt)	Transport Sources	0.63	0.42	0.24	0.20	0.19	0.14	0.15	0.15
	Industrial Processes	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.02
	Agriculture	28.8	26.8	29.4	30.5	30.9	30.8	31.6	30.9
	Waste	0.19	0.17	0.19	0.21	0.19	0.19	0.20	0.18
	Other	0.49	0.48	0.51	0.55	0.54	0.64	0.63	0.61
	Total	**30.1**	**27.9**	**30.3**	**31.5**	**31.8**	**31.8**	**32.6**	**31.8**

Emissions of ammonia from agriculture in Northern Ireland were estimated to be 30.9 kt in 2022. Agriculture accounted for 97% of total ammonia emissions in Northern Ireland in 2022. Emissions have increased overall by 6% since 2005 and account for 12% of the ammonia UK total in 2022. The UK has committed to reduce ammonia and other emissions under the international Gothenburg Protocol and the National Emissions Ceiling Regulations (2018). The agreed reductions in ammonia emissions are 8% by 2020 and by 16% by 2030, based on 2005 levels. Northern Ireland is expected to contribute to these targets. In the Defra Clean Air Strategy of 2019, the UK reiterated its commitment to the reduction of ammonia emissions by 16% by 2030.

The disaggregation of agriculture sector ammonia emissions in Northern Ireland in 2022.

An examination of the disaggregated agriculture sector ammonia emissions in Northern Ireland for 2022, shown in Figure 20, shows that the management of animal manures produces the greatest proportion of emissions. Cattle manure management accounts for 38.8% of agriculture sector ammonia emissions, manure applied to soils accounts for 35.2% of agriculture sector ammonia emissions, and other manure management accounts for 10.6%. Inorganic fertilisers and grazing

[73] https://naei.energysecurity.gov.uk/sites/default/files/2024-10/DA_Air_Pollutant_Inventories_2005-2022.pdf

animal excreta accounted for much smaller proportions of agriculture sector ammonia emissions, contributing 8.0% and 7.4% of agriculture sector emissions respectively.

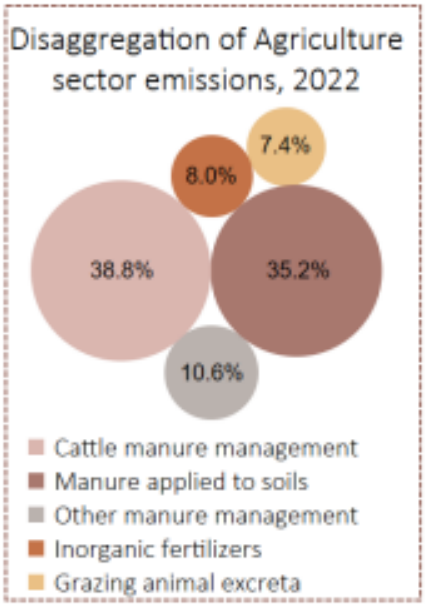


Figure 20. Disaggregation of Agriculture Sector Ammonia Emissions in Northern Ireland in 2022[76].

8.2 Monitoring Indicator 2 - The current status of habitats in Northern Ireland

The Northern Ireland Environmental Statistics Report 2024 stated that 38% of habitats are in favourable condition, shown in Table 32, with woodlands, heathlands, and bogs having the lowest proportion of features in favourable condition.

Table 32. Condition of features within terrestrial protected sites by type of feature, year ended March 2024[74].

Feature Type	Number of Features	Number of Features in Favourable Condition	Proportion Favourable %
Habitats			
Bogs	53	12	23%
Coastal	52	22	42%
Freshwater	58	17	29%
Grasslands	102	64	63%
Heathlands	43	6	14%
Inland Rock	16	11	69%
Marine	46	40	87%
Fen, marsh & swamp	89	27	30%
Woodlands	80	5	6%
Habitats Total	**539**	**204**	**38%**

Information is available from the UK Trends Report on critical load and level exceedances[75], which shows the proportion of protected/designated sites in Northern Ireland at which there are modelled exceedances of Critical Loads for nitrogen (deposition) and Critical Levels of ammonia (atmospheric concentrations).

Table 33: The proportion of N Ireland sensitive sites exceeding critical levels and loads.

	Sites exceeding critical levels of ammonia concentrations (Cle)		Sites exceeding critical loads for N deposition (Clo)
	>1 µg m^{3*}	>3 µg m^{3**}	
ASSI	100%	14.8%	100%
SAC	100%	14.8%	100%
SPA	98.6%	12.8%	99.5%

*Lichens/bryophytes

**Higher, vascular plants

[74] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/NI%20Environmental%20Statistics%20Report%202024_0.pdf
75 Air Pollution Trends Report 2023: Critical load and critical level exceedances in the UK. Report to Defra:

Table 33 shows the percentage of sites in Northern Ireland experiencing exceedances of critical levels set for ammonia concentration: 1 µg/m^3 is the level set for the protection of 'lower' plants such as lichens and bryophytes (for example, mosses); and 3 µg/m^3 is the concentration of ammonia in the air above which direct damage to plant tissue occurs for 'higher' plants (flowering plants).

Table 33 also shows the percentage of each type of designated/protected site experiencing modelled exceedance of its critical load for nutrient nitrogen.

8.3 Monitoring Indicator 3 - Atmospheric ammonia monitoring in Northern Ireland

A network of 25 ammonia (NH_3) monitoring sites implementing the UKCEH ALPHA® method (ALPHA® network) and 4 reactive gases and aerosols monitoring sites implementing the UKCEH DELTA® method (DELTA® network) was established in spring 2019 across Northern Ireland. The ALPHA® sites were selected to provide representative coverage of i) the range of modelled concentrations from FRAME (using the most recent 5 km NH_3 emissions data for 2016), (ii) each of seven major dominant emission source classifications: cattle (beef and dairy), pigs & poultry, sheep, mixed, non-agricultural, fertiliser and background (very low emission density, < 1 kg N ha-1 yr-1), and (iii) spatial coverage across Northern Ireland. The aims of the measurements were to (i) explore spatial and temporal patterns in NH_3 concentrations, (ii) compare results with the FRAME atmospheric transport model and for verification of UK NAEI emissions inventory and FRAME model, (iii) monitor and assess relationship between NH_3 and interacting gases (HNO_3, SO_2) and inorganic particulate phase composition.

A comparison of year 1 annual mean NH_3 concentrations (Mar 19 – Feb 20) with the modelled surface concentrations from the FRAME model (for emission year 2016) showed broad agreement.

Seasonal pattern observed at the different sites show that NH_3 concentrations are related to emission source categories present locally (e.g. sites grouped according to dominant emission source sectors for the grid square) and by changes in environmental conditions with smallest concentrations in the winter months. Details are shown in Figure 21[76].

[76] https://nora.nerc.ac.uk/id/eprint/536403/1/N536403CR.pdf

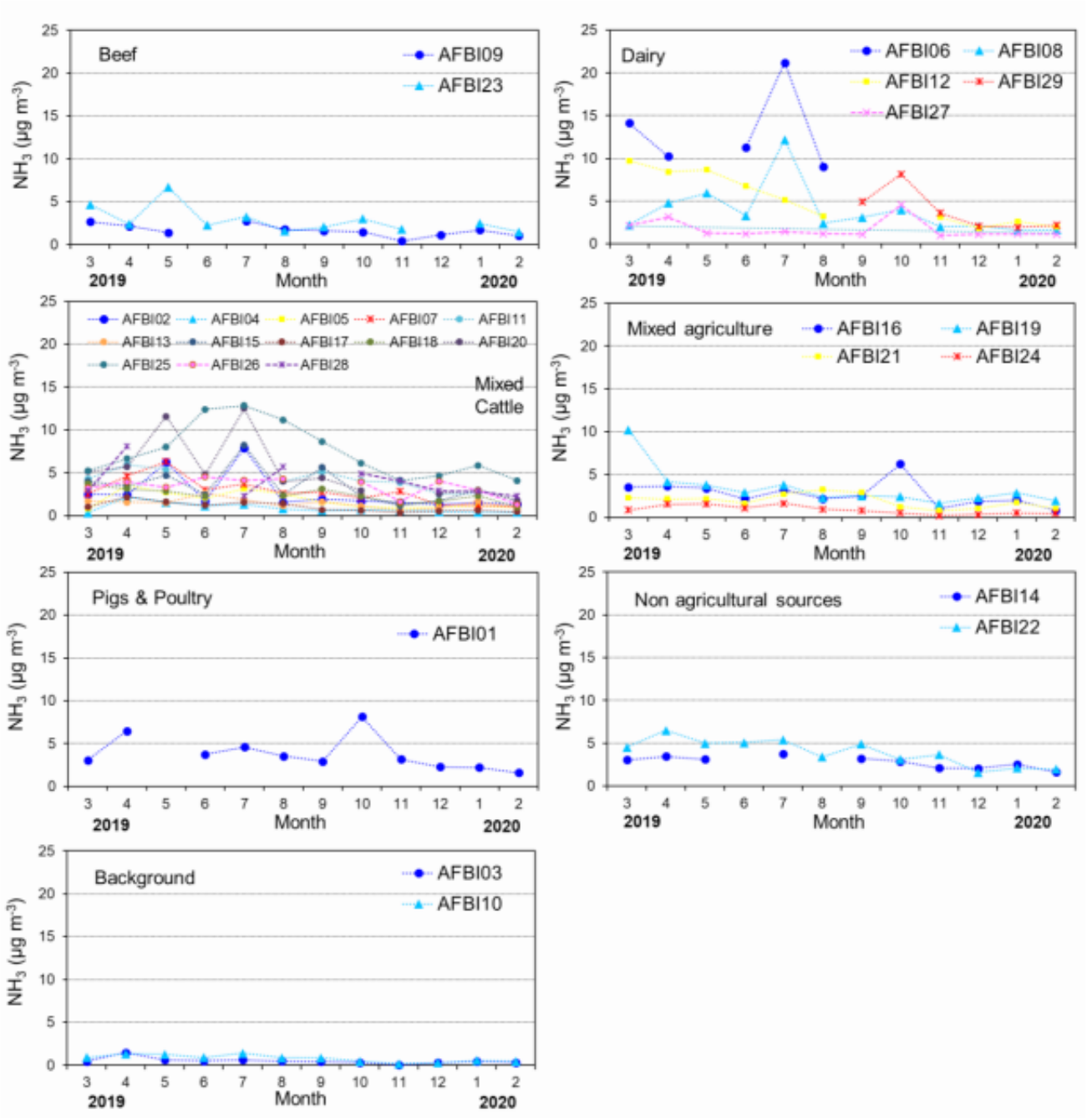


Figure 21. Time series of monthly NH_3 concentrations measured at sites (12 months of data from March 2019 to Feb 2023, in the NI ALPHA® and DELTA® networks, grouped according to dominant emission source sectors.

The time series of monthly NH_3 concentrations measured at all 28 sites in the network are shown in Figure 21. The sites are grouped according to their dominant emission source categories in each of the graphs. This allows a visual comparison of seasonal patterns between the different categories, and also between sites in each of the categories. The first 12 months of data (March 2019 to February 2020) show informative differences in concentrations between months and differences in the magnitude of concentrations between sites from different source categories.

Inclusion of 25 Northern Ireland monitoring sites in the National Atmospheric Monitoring Network (NAMN)

During 2022, 25 sites in the Northern Ireland network described above were added to the National Ammonia Monitoring Network (NAMN), bringing the total number of NAMN sites in the UK providing monthly measurements of atmospheric NH_3 to 98. Figure 22 below shows the location of the NI NAMN sites added to the network in 2022[4].

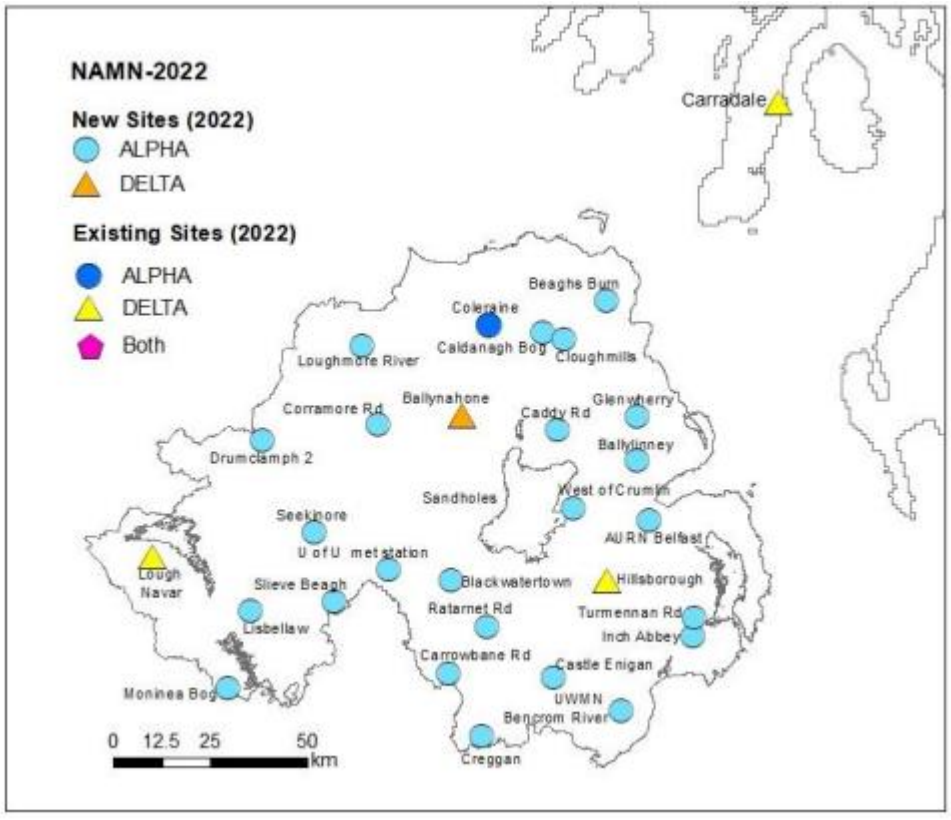


Figure 22. National Ammonia Monitoring Network (NAMN)

The spatial variability of the annual concentration of NH_3 across the UK sites are presented in Figure 23. The figure shows lower concentrations of NH_3 primarily located in the north of Scotland, with some locations in the south coast of England. High ammonia air concentration values are shown across the south and north-east of Northern Ireland.

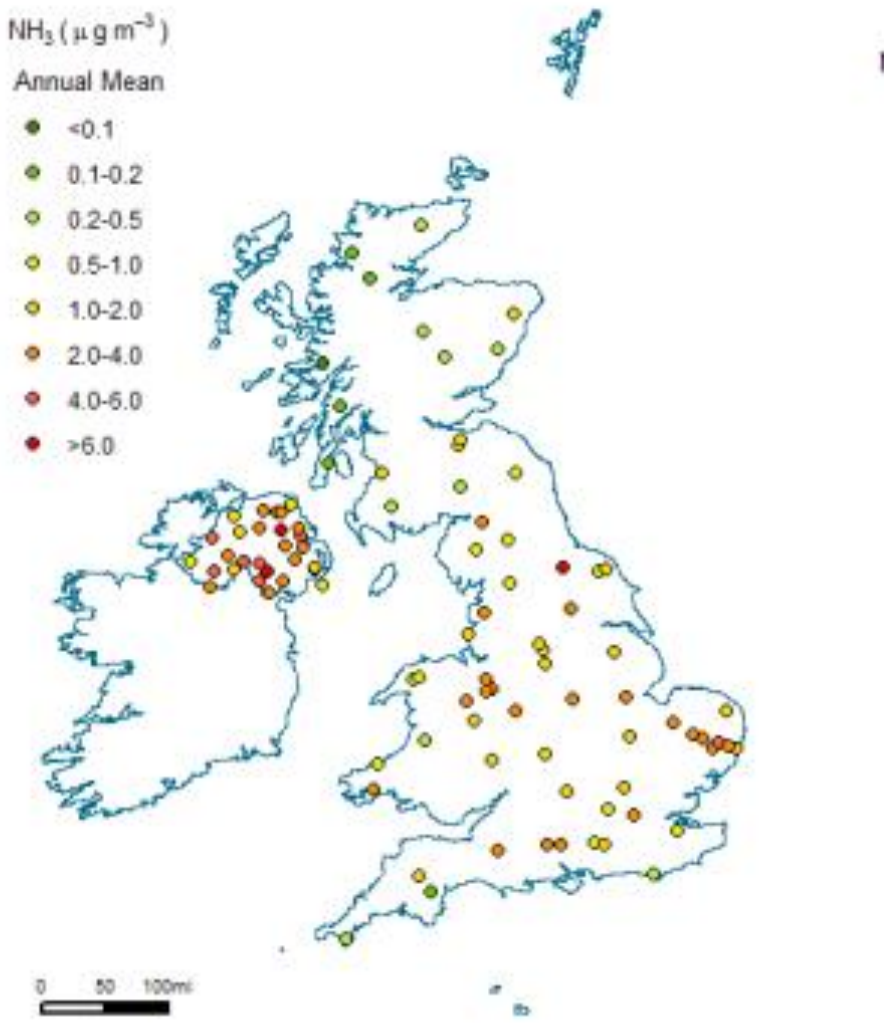


Figure 23. Spatial patterns of annual NH_3 concentrations from monthly NAMN/AGANET measurements.[4]

Going forward the NAMN data for Northern Ireland will provide an annual report of the NH_3 concentrations at the sites and will be used to evaluate the impact of the measures in the Ammonia Strategy. The current research project for the inclusion of the 25 NI sites in the National Ammonia Monitoring Network is scheduled to end on 31 March 2025 and this is being reviewed, taking into consideration the significance of the network's contribution to informing the delivery of ammonia emissions reductions and ground truthing NH_3 modelling and NAEI data.

8.4 Monitoring Indicator 4 – Uptake of on-farm mitigation measures

8.4.1 The 2020 Survey of Nutrient Management Practices

DAERA carried out an online survey of Nutrient Management Practices in 2020 to capture baseline data on farm nutrient management practices including slurry application and storage methods and enable increased granularity of NI on-farm practices in the National Atmospheric Emissions Inventory.

Results of the survey:

1. **The % of slurry spread by different methods**

Farm type	splashplate /not ploughed in	splashplate / ploughed in within 4 hrs	splashplate / ploughed in after 4 hrs	trailing hose/dribble bar	trailing shoe	Deep injection
Beef	80	3	2	12	3	0
Dairy	61	2	0	25	10	1

2. **The % slurry of spread by contractor: 42% for beef; 36% for dairy.**

3. **The % slurry stored by different methods**

Farm type	Above ground tanks uncovered	Above ground tanks covered	Below ground tanks	Lagoons
Beef	5	3	89	3
Dairy	23	3	70	4

4. **The % farmyard manure stored by different methods**

Farm type	Manure stored uncovered	Manure stored covered	Other storage
Beef	64	31	5
Dairy	75	25	0

8.4.2 The 2023 Agricultural Census

Questions used to capture the data above in the 2020 survey were subsequently included in the 2023 online Agricultural Census to enable data to be captured at a much greater scale to inform baselines and enhance the granularity of NI on-farm practices in the National Atmospheric Emissions Inventory.

8.4.3 The 2024 Agricultural Census

Questions in the 2024 Agricultural Census on the use of Low Emission Slurry Spreading Equipment were revised to capture data on how farm business would respond to a change in LESSE regulations. Questions asked if participants already owned LESSE or if they would plan to purchase LESSE in response to a change in LESSE regulations. Farm businesses were then asked to detail what type of LESSE they already owned or intended to purchase. The data provided is being used to inform policy development. The 2024 Agricultural Census data on LESSE is available to view in an Interactive publication on the DAERA website, in Section 8 – Agricultural Insights[77]. DAERA will also liaise with industry stakeholders to develop opportunities for further strategic data collection in specific sectors.

[77] https://www.daera-ni.gov.uk/publications/agricultural-census-northern-ireland-2024

9. Next Steps

The next steps in the process are:

A. Completion of the eight-week consultation on the SEA Environmental Report for the combined Proposed Ammonia Strategy and Revised Operational Protocol.

B. Consideration of stakeholder responses to the consultation on the SEA Environmental Report.

C. Updating the SEA Environmental Report to take into consideration the views of stakeholders.

D. Production of the SEA Statement.

10. Freedom of Information Act 2000: Confidentiality of Consultations

DAERA will consider the Environmental Report and the results of this consultation in the decision-making. Information will be provided when the Operational Protocol and Ammonia Strategy are adopted and show how the results of the environmental assessment have been taken into account

Your response, and all other responses to the consultation, may be disclosed on request. The Department can refuse to disclose information only in exceptional circumstances.

Before you submit your response, please read the paragraphs below on the confidentiality of consultations and they will give you guidance on the legal position about any information given by you in response to this consultation.

The Freedom of Information Act 2000 gives the public a right of access to any information held by a public authority (the Department in this case). This right of access to information includes information provided in response to a consultation. The Department cannot automatically consider as confidential information supplied to it in response to a consultation. However, it does have the responsibility to decide whether any information provided by you in response to this consultation, including information about your identity, should be made public or treated as confidential. This means that information provided by you in response to the consultation is unlikely to be treated as confidential, except in very particular circumstances.

The Lord Chancellor's Code of Practice on the Freedom of Information Act provides that:

• the Department should only accept information from third parties in confidence if it is necessary to obtain that information in connection with the exercise of any of the Department's functions and it would not otherwise be provided.

• the Department should not agree to hold information received from third parties 'in confidence' which is not confidential in nature.

• acceptance by the Department of confidentiality provisions must be for good reasons, capable of being justified to the Information Commissioner.

For further information about confidentiality of responses, please contact the Information:

Commissioner's Office

Tel: (028) 9027 8757

Email: ni@ico.org.uk

Web: https://ico.org.uk

Appendix A - Review of Relevant Plans and Programmes

This section considers the relationship between the Proposed Ammonia Strategy, the Revised Operational Protocol, and relevant plans and programmes. It also considers the environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation.

Table 34. Relevant Plans, Programmes and Policies Reviewed in Appendix A.

International Level	
4.1.1	The Convention on Wetlands – The Ramsar Convention
4.1.2	Bern Convention (Convention on European Wildlife and Natural Habitats) (1982)
4.1.3	UN Convention on Biological Diversity (1992)
UK level	
4.1.4	National Emission Reduction Commitments Directive (NEC) Directive (2016/2284/EU)
National Level	
4.1.5	The Conservation (Natural Habitats, etc.) Regulations 1995 (Northern Ireland) ('Habitats Regulations')
4.1.6	The Environment (Northern Ireland) Order (2002)20
4.1.7	The PPC (IE) Regulations (NI) 2013
4.1.8	The Wildlife and Natural Environment Act NI (2011)
4.1.9	The Air Quality Standards Regulations (Northern Ireland) 2010
4.1.10	The DAERA Plan to 2050 - Sustainability for the Future
4.1.11	The draft Green Growth Strategy for Northern Ireland
4.1.12	The Environmental Improvement Plan for Northern Ireland
4.1.13	The draft Nature Recovery Strategy
4.1.14	The Nutrients Action Programme (NAP)
4.1.15	Sustainable Agriculture Programme
4.1.16	The draft Clean Air Strategy for Northern Ireland
4.1.17	North Atlantic Salmon Conservation Organisation (NASCO), Convention for the Conservation of Salmon in the North Atlantic Implementation Plan 2019-2024
4.1.18	The Fisheries Act (NI) 1966 (as amended)
4.1.19	The Nitrogen Futures Report

4.1.20	The Scottish Nitrogen Balance Sheet
4.1.21	Nitrogen Impacts in Natural Ecosystems (NINE)
4.1.22	Ireland’s 5th Nitrates Action Programme 2022-2025
4.1.23	Lough Neagh Report and Action Plan

Plan/Programme/Policy	High Level Description	Environmental Protection Objectives	How they have been taken into account in the Proposed Ammonia Strategy (AS) and Revised Operational Protocol (OP)
International			
The Convention on Wetlands – The Ramsar Convention	International intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. As part of the UK national site network, Ramsar sites are subject to the requirements of The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended).	The conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world.	The AS and OP will both have positive impacts for the conservation of wetlands by reducing levels of ammonia and nitrogen deposition.
Bern Convention (Convention on European Wildlife and Natural Habitats) (1982)	The Bern Convention is a binding international legal instrument on nature conservation, covering most of the natural heritage of the European continent and extending to some States of Africa	Objectives are to conserve wild flora and fauna and their natural habitats, as well as to promote European co-operation in this field.	The AS and OP will both have positive impacts for nature conservation by reducing levels of ammonia and nitrogen deposition.
UN Convention on Biological Diversity (1992)	Maintenance and enhancement of biodiversity to ensure fair and equitable sharing of the benefits from the use of genetic resources.	Conservation of biodiversity. from genetic resources. Development of national strategies for the conservation and sustainable use of biological diversity.	The AS and OP will both have positive impacts for biodiversity by reducing levels of ammonia and nitrogen deposition.

Plan/Programme/Policy	High Level Description	Environmental Protection Objectives	How they have been taken into account in the Proposed Ammonia Strategy (AS) and Revised Operational Protocol (OP)
UK level			
National Emission Reduction Commitments Directive (NEC) Directive (2016/2284/EU)	The 2016 NEC Directive sets 2020 and 2030 emission reduction commitments for five main air pollutants. The directive transposes the reduction commitments for 2020 agreed by the EU and its Member States under the 2012 revised Gothenburg Protocol under the Long-range Transboundary Air Pollution Convention (Air Convention). The directive was transposed in the UK by the National Emissions Ceiling Regulations (2018) (these Regulations are now UK retained law, following EU Exit).	A national reduction commitment to 2030 for ammonia of a 16% reduction based on 2005 levels, under Regulation 6(3).	The AS target of a 25% reduction in total agricultural ammonia emissions by 2030 arises from the NEC national reduction commitment to 2030. Decreasing ammonia emissions will be a material consideration in considering impacts from developments through the use of thresholds in the OP. Reductions in the number of designated habitats exceeding their Critical Levels of ammonia and Critical Loads of nitrogen deposition as a result of the NI-wide reductions in ammonia emissions will be taken into consideration through the thresholds used in the OP, for example the Site Integrity Assessment Threshold. Local reductions achieved through the use of the OP will provide a contribution to the Ammonia Strategy reduction target.

Plan/Programme/Policy	High Level Description	Environmental Protection Objectives	How they have been taken into account in the Proposed Ammonia Strategy (AS) and Revised Operational Protocol (OP)
National Level			
The Conservation (Natural Habitats, etc.) Regulations 1995 (Northern Ireland) ('Habitats Regulations')	DAERA is responsible for compliance with The Conservation (Natural Habitats, etc.) Regulations 1995 (Northern Ireland) ('Habitats Regulations') as amended by The Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019, which is the relevant law with respect to habitats and species in Northern Ireland following EU Exit.	These regulations require competent authorities, public bodies, and decision-makers to agree to a plan or project only after having ascertained that it will not adversely affect the integrity of European site features.	The AS will reduce the number of designated habitats exceeding their Critical Levels of ammonia and Critical Loads of nitrogen deposition as a result of the NI-wide reductions in ammonia emissions. The OP delivers DAERA's duty under the regulations - DAERA has a duty to provide advice to planning authorities and other competent authorities on the potential negative environmental impacts of plans or projects on protected sites. NIEA Natural Environment Division performs this function for terrestrial/freshwater environments, on behalf of DAERA. The OP ensures that consents, permissions or other authorisations for plans or projects will only be granted where it can be demonstrated beyond reasonable scientific doubt that there will be no impacts on the national site network.

Plan/Programme/Policy	High Level Description	Environmental Protection Objectives	How they have been taken into account in the Proposed Ammonia Strategy (AS) and Revised Operational Protocol (OP)
The Environment (Northern Ireland) Order (2002)20	Sets out legislation involving pollution prevention and control, air quality and Areas of Special Scientific Interest (ASSI). Article 28 includes the provisions relating to declaration of an area that is of special interest by reason of any of its flora, fauna, or geological, physiographical or other features. Articles 38, 39, 40	Outlines provisions relating to the duty on the Department and other public bodies 'to take reasonable steps, consistent with the proper exercise of the body's functions, to further the conservation and enhancement of the flora, fauna or geological, physiographical or other features by reason of which the ASSI is of special scientific interest'.	The AS will reduce total agricultural ammonia emissions at an NI wide level, in line with the UK Emission Reduction Commitments. This will lead to a reduction in the Critical Levels and Critical Loads at ASSIs. The OP will be in line with this legislation and will assist the Department in fulfilling relevant statutory duties set out in this legislation.
The PPC (IE) Regulations (NI) 2013	The PPC (IE) Regulations (NI) require industrial and agricultural activities with high pollution potential to hold and maintain an environmental permit and meet certain environmental conditions.	Require industrial and agricultural activities with high pollution potential to hold and maintain an environmental permit and meet certain environmental conditions.	Achievement of the AS objective of reducing overall ammonia emissions will lead to reductions at designated, related to PPC Regulations through the OP as below. The OP provides the framework for authorisations under the PPC (IE) Regulations (NI) 2013 and the conditions under which nitrogen emitting developments/activities may take place, to safeguard against environmental damage.

Plan/Programme/Policy	High Level Description	Environmental Protection Objectives	How they have been taken into account in the Proposed Ammonia Strategy (AS) and Revised Operational Protocol (OP)
The Wildlife and Natural Environment Act NI (2011)	This act sets out the duty of every public body, in exercising any functions, to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions.	To further the conservation of biodiversity.	The AS will contribute to reductions in the number of designated sites experiencing exceedances of their Critical Loads of nutrient nitrogen and Critical Levels of ammonia, thereby improving the status of the habitats to facilitate improved nature recovery. The OP, through decreasing or minimising harmful impacts of air pollutants on designated sites, will assist the Department in its duty under the Act of furthering the conservation of biodiversity as far as is consistent with the proper exercise of its functions.
The Air Quality Standards Regulations (Northern Ireland) 2010	These regulations place a duty on NI government departments to monitor levels of air pollutants specified in the Air Quality Directives and ensure compliance with limit values for these pollutants.	Monitoring and compliance with Air Quality Directives.	The AS will contribute to compliance with Air Quality Standards Regulations (Northern Ireland) 2010. The OP will contribute to compliance with Air Quality Standards Regulations (Northern Ireland) 2010.

Plan/Programme/Policy	High Level Description	Environmental Protection Objectives	How they have been taken into account in the Proposed Ammonia Strategy (AS) and Revised Operational Protocol (OP)
The DAERA Plan to 2050 - Sustainability for the Future, published May 2021.	The DAERA Plan to 2050 – Sustainability for the Future, identifies strategic priorities to 2050.	Strategic priorities are: • To enhance our food, forestry, fishery, and farming sectors using efficient and environmentally sustainable models which support economic growth. • To protect and enhance our natural environment now and for future generations whilst advocating its value to and wellbeing for all. • To champion thriving rural communities that contribute to prosperity and wellbeing. • To be an exemplar, people focused organisation, committed to making a difference for the people we serve.	The Plan Sets the context for the AS to plan the way forward to reduce ammonia emissions from agriculture to support local farm businesses and rural communities and help them to thrive and be sustainable, while at the same time protecting the environment. The OP will protect our natural environment and ensure sustainable development, in line with the DAERA Plan to 2050.
The draft Green Growth Strategy for Northern Ireland	The draft Green Growth Strategy is the Executive's multi-decade strategy for climate, the environment & the economy. The draft strategy sets out a long-term vision for tackling the climate challenge by balancing climate action with the environment and the economy in a way that benefits all our people.	Its aim is to ensure future government policy making here has climate and environmental action at its core, embracing and enabling science and innovation to drive solutions.	The AS is aligned with the draft Green Growth Strategy's aims of embedding environmental considerations into decision making and ensuring new policies address biodiversity commitments. The OP will protect our natural environment, contribute to protection of biodiversity and ensure sustainable development, in line with the draft Green Growth Strategy.

Plan/Programme/Policy	High Level Description	Environmental Protection Objectives	How they have been taken into account in the Proposed Ammonia Strategy (AS) and Revised Operational Protocol (OP)
The Environmental Improvement Plan for Northern Ireland	Northern Ireland's first Environmental Improvement Plan will form the basis for a coherent and effective set of interventions that can deliver real improvements in the quality of the environment and thereby: improve the health and well-being of all who live and work here; create opportunities to develop our economy; elevate Northern Ireland to an environmental leader; and enable us to play our part in protecting the global environment for many decades to come.	Strategic Environmental Outcome 1 Excellent air, water & land quality. Strategic Environmental Outcome 2 Healthy & accessible environment & landscapes everyone can connect with & enjoy. Strategic Environmental Outcome 3 Thriving, resilient & connected nature and wildlife. Strategic Environmental Outcome 4 Sustainable production & consumption on land and at sea. Strategic Environmental Outcome 5 Zero waste & highly developed circular economy. Strategic Environmental Outcome 6 Net Zero greenhouse gas emissions & improved climate resilience and adaptability	
The draft Nature Recovery Strategy	DAERA is developing a Nature Recovery Strategy which will outline steps to deliver the ambitious changes needed to protect, restore, and enhance our natural environment in Northern Ireland by increasing species and ecosystem resilience to help us 'turn the curve' of biodiversity loss.	To meet the '30 by 30' target in the Kunming-Montreal Global Biodiversity Framework.	(AS and OP) Both the Proposed Ammonia Strategy and Revised Operational Protocol will contribute to reductions in the number of designated sites currently experiencing exceedances of their Critical Loads of nutrient nitrogen and Critical Levels of ammonia, thereby improving the status of the habitats to facilitate improved nature recovery.

Plan/Programme/Policy	High Level Description	Environmental Protection Objectives	How they have been taken into account in the Proposed Ammonia Strategy (AS) and Revised Operational Protocol (OP)
Sustainable Agriculture Programme	A new programme of Farm Support and Development, designed in consultation with the Northern Ireland agricultural industry and other key stakeholders, is being developed and phased in over the next couple of years.	The new programme will support and encourage the development of an agricultural industry with increased productivity, improved environmentally sustainable, resilient, and integrated into an effective functioning supply chain.	(AS) Various measures within the Sustainable Agriculture Programme may provide opportunities to deliver relevant elements within the Proposed Ammonia Strategy. These will be considered during ongoing policy development. (OP) Future farm support measures within the Sustainable Agriculture Programme may provide grant aid for ammonia mitigation measures, which may be recommended during assessment of potential air quality impacts. This will be considered during ongoing policy development.
The draft Clean Air Strategy for Northern Ireland	Work is progressing within DAERA on the development of Northern Ireland's first Clean Air Strategy. An inter-departmental working group has been established to further develop proposals and identify policies for cross-departmental consideration and inclusion within the final strategy.	In development.	(AS) Achievement of reductions in total ammonia emissions from agriculture in Northern Ireland will support reductions in levels of pollution by Particulate Matter (PM). (OP) The Operational Protocol will support reductions in levels of pollution by Particulate Matter (PM) through requiring reduced ammonia emissions from plans and projects.

Plan/Programme/Policy	High Level Description	Environmental Protection Objectives	How they have been taken into account in the Proposed Ammonia Strategy (AS) and Revised Operational Protocol (OP)
North Atlantic Salmon Conservation Organisation (NASCO), Convention for the Conservation of Salmon in the North Atlantic Implementation Plan 2019-2024	The convention aims to: • ensure the conservation of Atlantic salmon populations; • promote North Atlantic salmon stock conservation, restoration, enhancement and rational management, creating the North Atlantic Salmon Conservation Organization (NASCO); balance the interests of countries in whose rivers salmon originate and other countries whose jurisdictions cover where the salmon are fished.	Objectives are to contribute to the conservation, restoration, enhancement and rational management of salmon stocks, using the best scientific evidence available.	The AS and OP will contribute by reducing levels of ammonia and nitrogen deposition.
The Fisheries Act (NI) 1966 (as amended)	The Fisheries Act 1966 makes provision for the development and improvement of fisheries in Northern Ireland, consolidating amendments to the previous Fisheries Acts (Northern Ireland) from 1842 to 1954.	The monitoring of water quality and fish stocks.	The AS and OP will contribute by reducing levels of ammonia and nitrogen deposition.
The Nitrogen Futures Report[78]	Compares current and possible future emission reduction policies to help maximise the benefits to ecosystems and the people that live near them.	Development of spatial datasets, scenarios, testing of mitigation scenarios, analysis of co-benefits and trade-offs.	The report was taken into consideration in the development of mitigation measures in the AS.
The Scottish Nitrogen Balance Sheet[79]	To bring together evidence on flows of nitrogen in Scotland from across the whole economy to understand and keep track of the use of nitrogen.	The SNBS provides a new source of evidence to track how efficiently nitrogen is used in Scotland and help identify further opportunities to improve this. It will help support progress towards Scotland's national climate change targets.	The SNBS report was taken into consideration in the development of the AS.
Nitrogen Impacts in Natural Ecosystems (NINE)	To improve understanding of how nitrogen deposition interacts with climate change to impact biodiversity and ecosystem function in Scottish semi-natural habitats, with a	The project aims to provide evidence on the interactive effects on nitrogen and climate on biodiversity and functioning in Scottish ecosystems, to	The Nitrogen Mitigation report was taken into consideration in relation to monitoring of the impact of the AS and OP.

[78] https://jncc.gov.uk/our-work/nitrogen-futures/
[79] https://www.gov.scot/publications/scottish-nitrogen-balance-sheet-2020/

	particular focus on alpine and forest habitats and below ground biodiversity.	develop indicators of these impacts for use in environmental monitoring, and to explore the potential for mitigation of impacts and appropriate methods to apply.	
Ireland's 5th Nitrates Action Programme 2022-2025	The regulations contain specific measures to protect surface waters and groundwater from nutrient pollution arising from agricultural sources.	The Regulations provide a basic set of measures to protect waters, including drinking water sources, against pollution caused by nitrogen and phosphorus from agricultural sources, with the primary emphasis on the management of livestock manures and other fertilisers. The Regulations set the requirements for all farmers, irrespective of whether they claim payments under the Common Agricultural Policy or national schemes	Measures in the programme were taken into account in development of the AS.
Lough Neagh Report and Action Plan	The actions in the Lough Neagh report will build on and support the objectives to improve water quality across Northern Ireland contained in the EIP.	Outcomes: • A clear policy framework and associated route map to improving the environmental status of Lough Neagh, its wider ecosystem and waterbodies across Northern Ireland and improving water quality over the longer term.	The AS and OP will contribute by reducing levels of ammonia and nitrogen deposition.

Appendix B - SEA Screening Responses

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Date: 24/11/2021

HISTORIC ENVIRONMENT DIVISION COMMENTS RE: SEA SCREENING REPORT FOR THE DEPARTMENT OF AGRICULTURE ENVIRONMENT AND RURAL AFFAIRS DRAFT AMMONIA STRATEGY

DfC Historic Environment Division (HED) operate via a Service Level Agreement with colleagues in DAERA in relation to SEA, whereby, we provide authoritative comment and advice in relation to matters of Cultural Heritage including archaeological and architectural heritage. We make the following comments in respect of the documentation received by our office on 08/11/2021.

HED has reviewed the SEA Screening Report for the draft Ammonia Strategy 2021 and acknowledge the ambitions of the strategy *'..to address the impact of ammonia emissions on the environment in Northern Ireland'*. In this context, it is also important to note the intertwined relationship between the natural and historic environment, shaped by thousands of years of human interaction with the landscape and seascape, evidenced by field systems, paths, routeways, buildings, coastlines, and the biodiversity and land use activities they support. All these features and heritage assets contribute to the local distinctiveness, history and cultural heritage of a place.

We acknowledge the aim of the strategy is to reduce ammonia submissions *'to protect nature, to meet Northern Ireland's legal obligations and to ensure a sustainable agri-food sector.'* To deliver this, the strategy proposes nine measures to achieve ammonia reduction. Measure 2, *Longer Grazing Seasons*, and Measure 6 *Establishing Tree Plantations around Livestock Housing* outlined under para 3.2 a), may have potential effects on heritage assets and their settings, particularly historic monuments on agricultural land. We therefore consider that potential cultural heritage effects are also addressed under para 3.3 part f).

HED welcomes the conclusion that SEA is to be carried out to assess the potential impacts of the strategy with regard to the environment.

Historic environment datasets maintained by HED, should be used in the process of information gathering to understand where there is a likelihood or potential for impact on cultural heritage, the associated constraints, and potential mitigation measures. Our datasets are available at Historic Environment Digital Datasets | Department for Communities (communities-ni.gov.uk) Further datasets in relation to Northern Ireland's marine historic environment are available on request from colin.dunlop@daera-ni.gov.uk

Should you have any queries in regard to the content of our response please contact us at the above address.

Yours sincerely

Liam McQuillan MCIfA
Senior Archaeologist

Naoimh Quinn RIBA
Senior Architect

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26th November 2021

Patrick Savage
Ammonia Policy
Environment Marine and Fisheries
Department of Agriculture, Environment and Rural Affairs
Dundonald House

Dear Mr. Savage

Re: Screening report on the determination for Draft Ammonia Strategy 2021

Thank-you for your email dated 5th November 2021 regarding the Strategic Environmental Assessment (SEA) Screening Report for the Draft Ammonia Strategy 2021.

The Department of Agriculture, Environment and Rural Affairs Northern Ireland (DAERA) and (supported with a service level agreement) DfC Historic Environment Division (HED), has considered the consultation and associated documents and our opinions are set out below.

Consideration of Likely Significant Effects

We have considered whether the Strategy is likely to have significant environmental effects in line with the requirements of Regulation 9 of the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004.

DAERA SEA Team agrees with the responsible authority and the conclusions of the Strategic Environmental Assessment Screening Report that the Strategy is likely to have significant environmental effects and therefore a SEA will be carried out.

Regulation 10 publicity of Determinations can now be initiated.

Habitats Regulations Considerations

We recommend that responsible authority undertakes Habitat Regulations considerations prior to the Draft Ammonia Strategy adoption to ensure the strategy is not likely to have significant effects on any Natura 2000 site within Northern Ireland.

General Comments

We note **section 1.3.3** highlights that the report will "screen the bTB Eradication Strategy against the Annex II criteria to determine if significant effects are likely and if a SEA is required." This is an error and should be changed to the Draft Ammonia Strategy.

Climate Team Comments

Climate Change Mitigation Branch refers Department for Agriculture, Environment and Rural Affairs (DAERA) to the requirements laid out within the Climate Change Committee's Sixth Carbon Budget publication, with particular reference to the options for reducing emissions starting at Page 11 of the Agriculture and Land Use summary. A link for this can be found below.

Sixth Carbon Budget Agriculture and Land Use

The Climate Change Committee (CCC) recently published its UK Climate Risk Independent Assessment 2021 which identifies the risk and opportunities posed by climate change over the next five years. A summary for Northern Ireland can be found below.

https://www.ukclimaterisk.org/independent-assessment-ccra3/national-summaries/

Marine Plan Team Response

The Marine Plan Team welcome the opportunity to comment on the draft Ammonia Strategy 2021 SEA Screening Report and are content with the conclusions of the screening process that a SEA will be required.

It is observed that the Screening Report has a strong land-based focus. Ammonia is very soluble in water and the Ammonia Strategy whilst it can potentially have significant effects on human health and the natural environment, it may also have potential effects on the marine environment.

It is recommended that more detail could be provided in relation to the marine environment and/or specific reference given to potential effects (both positive and negative) on the marine environment.

In developing the Ammonia Strategy (and future policy proposals) and progressing this SEA process, it is advised that appropriate account must be taken of marine policy documents in line with the obligations as outlined in Section 8 of the Marine Act (NI) 2013 (MANI) and Section 58 of the Marine and Coastal Access Act (MCAA) 2009 with respect to decisions affected by marine policy documents / a marine plan.

Current marine policy documents include the UK Marine Policy Statement 2011 and the draft Marine Plan for Northern Ireland published in April 2018. Both documents are available on the DAERA website at: Marine planning | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk).

The marine policy documents above provide the framework for decision making by public authorities taking decisions which affect or might affect the whole or any part of the marine area. This applies to both authorisation and enforcement decisions; and decisions related to the exercise of any function capable of affecting the marine area, such as this Ammonia Strategy and future policy proposals.
In relation to section 3.3 characteristics of the effects and of the area likely to be affected, you may wish to consider the following:

- Part (c) states delivering the Strategy will reduce the level of transboundary Nitrogen Deposition. It is unclear if this includes the potential deposition in the transboundary marine environment.
- Part (d) recognises the beneficial impact of the strategy on human health and in protecting nature. Consideration should be given to specifically including the protection of the marine environment.
- Part (e) recognises the spatial extent of the strategy across Northern Ireland. It is suggested that the marine area (and its environment) should be explicitly included within the spatial extent of potential effects.
- It is unclear if marine habitats and/or species have been considered within Part (f) relating to the value and vulnerability of the area likely to be affected.
- It is unclear if the marine area in Part (g) has considered the effects on those marine areas and landscapes, including seascapes with protection status.

The draft Ammonia Strategy Screening Report highlights the impacts on the terrestrial environment. It is recommend that consideration be given to potential effects on the marine environment within the next stages of the SEA process. This will ensure your assessment process is transparent and robust. The UK MPS and the draft Marine Plan for Northern Ireland, are useful resources to help inform the updating of this Screening Report, and the next stages of the SEA process with respect to the environmental considerations in the marine area.

Inland Fisheries Response

DAERA Inland Fisheries, is a core branch within Marine and Fisheries Division of the Department of Agriculture Environment and Rural Affairs. It has a statutory remit for the conservation, protection, development and improvement of salmon and inland fisheries under the Fisheries Act (NI) 1966 (as amended).

DAERA Inland Fisheries is the implementing authority under the Convention for the Conservation of Salmon in the North Atlantic. This treaty requires signatory states to develop programmes of work to conserve, rationally manage and improve Atlantic salmon populations and their habitats within their jurisdiction. This work is scrutinised by the North Atlantic Salmon Conservation Organisation (NASCO).

DAERA Inland Fisheries welcomes the opportunity to comment on the SEA Screening report for the Department of Agriculture Environment and Rural Affairs Draft Ammonia Strategy. Inland Fisheries has considered the assessment for the determination of SEA requirement and screening request for possible impacts. Inland Fisheries would suggest that any SEA to be carried out should be cognisant of other Relevant Plans and Programmes and within this reference should be made to both as follows – North Atlantic Salmon Conservation Organisation (NASCO), Convention for the Conservation of Salmon in the North Atlantic Implementation Plan for the period 2019 – 2024, this an international commitment for Northern Ireland (as part of the UK) and The Fisheries Act (NI) 1966 (as amended).

Inland Fisheries considers the likely impacts from this strategy to be positive to the environment, including the aquatic environment and welcomes this approach. It is noted that a 'key aim of the Ammonia Strategy is to protect priority habitats which are currently exceeding critical levels (the concentration of ammonia in the air) and critical loads (nitrogen deposition). There is significant exceedance across the protected network: …' - Inland Fisheries would recommend that any SEA to be carried out as a result of this determination does not confine its' remit to designated sites alone. Potential impacts to all priority habitats and priority species should be included, Northern Ireland has within its' jurisdiction many rivers and watercourses which are not designated and these support priority species of considerable biodiversity and conservational value, as such these should not be overlooked or considered to be of any less significance.

As a statutory consultee DAERA Inland Fisheries will continue to provide comment on any proposals put forward as a result of this plan through the normal planning process. The Loughs Agency is the lead body for provision of advice regarding impacts to salmonid and inland fisheries interests within the catchments of Lough Foyle and Carlingford Lough. Consequently, said agency should also be consulted in relation to

this SEA Scoping exercise. DAERA Inland Fisheries will provide fisheries advice for those areas outside of the catchments of Foyle and Carlingford Loughs.

Please contact the SEA Team at seateam@daera-ni.gov.uk should you have any queries or require clarification.

Yours sincerely,

Donna Whelan
Senior Scientific Officer
Countryside, Coast and Landscape
Northern Ireland Environment Agency
Donna.Whelan@daera-ni.gov.uk

SEA Screening for the draft Ammonia Strategy 19 01 24

Marine Conservation Branch Response

Marine Conservation Branch agrees with the conclusion of the scoping report: '*That a Strategic Environmental Assessment will be required.'*

However, we have the following comments for consideration:

- On Page 3 reference is made to the Habitats Directive (in relation to DAERA being responsible for compliance with this). This should be amended to the Habitats Regulations following the UK's exit from the EU.
- On Page 7 for Question 3, we advise the answer should be amended to state 'Yes' as the draft strategy has been prepared for agricultural management and does set a framework for future development consent of projects in Annexes I and II to the EIA Directive' resulting in the move to point 5.

Marine Planning Team Response

MPT agree with the conclusions of the SEA Screening Report, that a SEA will be required for the draft Ammonia Strategy.

It is observed that the answer to Question 3 in the Table under section 3.1 of the Screening Report is listed as 'No'. Should the answer to this question be amended to 'Yes' given the screening moves to Question 5.

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Date: 12/01/2024

HISTORIC ENVIRONMENT DIVISION COMMENTS ON SEA SCREENING REPORT FOR AMMONIA STRATEGY 2024

DfC Historic Environment Division (HED) operate via a Service Level Agreement with colleagues in DAERA in relation to SEA, whereby we provide authoritative comment and advice in relation to matters of Cultural Heritage including archaeological and architectural heritage. We make the following comments in respect of the documentation received by our office on 2nd January 2024.

HED has reviewed the screening report and we concur with the recommendation that a SEA is required.

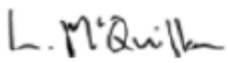
To assist moving forward to scoping stage we advise that our digital datasets which include recorded designated and non-designated heritage assets, are available to

download at:https://www.communities-ni.gov.uk/publications/historic-environment-digital-datasetshttps://www.communities-ni.gov.uk/services/historic-environment-map-viewer.. This data can also be accessed via our Historic Environment Map Viewer .

We also highlight for the purposes of assessment the inter-relationship of the historic environment with other topic areas such as landscape, water and biodiversity and the natural environment.

If there are any queries around the content of our response we can be contacted at the address above.

Yours sincerely,



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Dr Kate Semple
Ammonia and Nutrients Branch
Natural Environment Policy Division
Room 141, Dundonald House
Upper Newtownards Road

17th January 2024

Re: SEA Screening Consultation for NI Draft Ammonia Strategy

Thank-you for your email dated 22nd December 2023 regarding the Strategic Environmental Assessment (SEA) Screening Report for the NI Draft Ammonia Strategy.

The SEA Team within the Department of Agriculture, Environment and Rural Affairs Northern Ireland (DAERA) and (supported with a service level agreement) DfC Historic Environment Division (HED), has considered the consultation and associated documents and our opinions are set out below.

Consideration of Likely Significant Effects

We have considered whether the Strategy is likely to have significant environmental effects in line with the requirements of Regulation 9 of the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004.

DAERA agrees with the responsible authority and the conclusions of the screening report that the Strategy is likely to have significant environmental effects and therefore a SEA will be carried out.

Habitats Regulations Considerations

We recommend that the responsible authority undertakes Habitat Regulations Assessment screening prior to the strategy adoption to ensure the strategy is not likely to have significant effects on any National Site Network sites within Northern Ireland in line with The conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995 (as amended).

Northern Ireland Environment Agency
www.daera-ni.gov.uk

Air Quality, Biodiversity Unit Comments (AQBU)

Section 2.2 - "A mandatory tiered approach to move to 100% use of Low Emission Slurry Spreading Equipment by XX" – missing year. Section 3.2 states 2026.
Typo on Page - 10 UK13?
Spatially targeted measures around designated sites are not specifically cited within Section 2.2. AQBU consider that such measures are essential to achieve the ammonia reductions required to protect sensitive habitats from further degradation.
AQBU support the conclusion of the SEA Screening Assessment that a SEA is required. AQBU will comment on the SEA Scoping Assessment when it is available.

Please contact the SEA Team at seateam@daera-ni.gov.uk should you have any queries or require clarification.

Yours sincerely,

p.p. *Caroline Nolan*

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Dr Kate Semple
Ammonia and Nutrients Branch
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Sydenham Intake
Belfast BT3 9ED

17/07/2024

Dear Dr Semple,

Re: Consultation on the Combined Strategic Environmental Assessment Screening and Scoping Report for DAERA's Operational Protocol and Ammonia Strategy.

The SEA Team within The Department of Agriculture, Environment and Rural Affairs Northern Ireland (DAERA) and (supported with a service level agreement) DfC Historic Environment Division (HED), has considered the consultation and associated documents and our opinions are set out below and in the separate document from HED.

General SEA Comments

DAERA are content with the conclusions of the screening report and agree that a full SEA is required for the combined Operational Protocol and Ammonia Strategy.

DAERA would like the SEA Environmental Report (ER) to contain a clear statement indicating the opinion (and the reasons for it), about whether or not the implementation of the Plan, in combination with any identified measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment, is likely to have a significant effect on Northern Ireland.

Where there is the potential for transboundary impacts they must be considered in the ER as above and transboundary consultation with the relevant bodies should be carried out at each stage, we note that this has been highlighted in the scoping report.

Natural Environment Division (NED) Comments

We welcome that the Environmental Report will include objectives, targets and indicators and explore alternatives. All appropriate alternatives should be considered and assessed to ensure the plan is informed by the ER. The ER should also include detail on mitigation and monitoring of the plan. We are broadly content with the proposed scope of the ER however we note that not all SEA themes have been scoped in and an explanation should be provided in the ER to support their exclusion from the assessment. We draw your attention to HED and Landscape comments on the combining of Cultural Heritage and Landscape themes.

NED note that whilst the Ammonia Strategy was originally screened in for AA it has now been screened out due to 'significant changes' to the proposed mandatory measures in the strategy. NED are unclear on what these changes are and how the new conclusion was reached. The Test of Likely Significance (ToLS) that has been carried out should be provided to the Consultation Body. We welcome that a ToLS will be carried out on the protocol and agree that this should be carried out and AA if appropriate. We look forward to commenting on this along with any AA that may be carried out.

The proposed timescale for the process seems reasonable and is acceptable in terms or SEA consultation time periods. We remind the Responsible Authority of their obligations under the Post Adoption Procedures of the Regulations (Regulation 15 EAPP Regs (NI) 2004) which must be carried out as 'soon as reasonably practicable' when the Plan is adopted. It would be normal practice to publish the post adoption statement alongside the adopted plan.

It may be worth including in your considerations the following:

- The Wildlife (NI) Order 1985 (as amended)
- Wildlife and Natural Environment Act (NI) 2011
- The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended)
- The Environment (NI) Order 2002
- The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017
- The Strategic Planning Policy Statement (SPPS) for Northern Ireland
- Planning Policy Statements (PPS – in particular PPS2 and PPS18). It should be noted that the PPS's will be superseded by Local Development Plans when they are adopted.
- Biodiversity Strategy for NI to 2020 https://www.daera-ni.gov.uk/publications/biodiversity-strategy-northern-ireland-2020-0
- Draft Environment Strategy https://www.daera-ni.gov.uk/consultations/esni-public-discussion-document
- The Draft NI peatland policy: https://www.daera-ni.gov.uk/consultations/ni-peatland-strategy-consultation.
- The Draft Green Growth Strategy Consultation on the draft Green Growth Strategy for Northern Ireland | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)
- Northern Ireland Energy Strategy 2050 Northern Ireland Energy Strategy 2050 | Department for the Economy (economy-ni.gov.uk)

DAERA have a map browser for NI protected sites and known priority habitat: www.daera-ni.gov.uk/services/natural-environment-map-viewer

A number of useful information sources that highlight the current state of the environment in Northern Ireland at a regional level and which could be referenced are:

Northern Ireland State of the Environment Reports: https://www.daera-ni.gov.uk/publications/state-environment-report-2013

Northern Ireland Environmental Statistics Reports: https://www.daera-ni.gov.uk/articles/northern-ireland-environmental-statistics-report

Other relevant web-links are;
Designated Scientific Sites: www.daera-ni.gov.uk/landing-pages/protected-areas

Regional Landscape Character Map viewer: https://www.daera-ni.gov.uk/services/regional-landscape-character-areas-map-viewer

DAERA have a map browser for NI protected sites and known priority habitat: www.daera-ni.gov.uk/services/natural-environment-map-viewer

Our natural environment datasets are available at the link below: www.daera-ni.gov.uk/articles/download-digital-datasets

Appropriate Assessments should refer to the status of habitats and species in the relevant reports available on the JNCC website as follows: UK Article 17 report for the Habitats Directive https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019/ and the UK Article 12 report for the Birds Directive https://jncc.gov.uk/our-work/european-reporting/#birds-directive-reporting

Landscape Team Comments

Having considered the Scoping Report for the Ammonia Strategy and Operational Protocol. The Landscape and Visual Team have the following comment to be considered.

Landscape & Visual Amenity is normally considered as a separate topic area with a SEA Assessment. In the Scoping report Landscape has been linked with Cultural Heritage under the topic headings. The two topics should be separated, and new Landscape and Cultural Heritage objectives should be created to reflect this.

Water Management Unit Comments

The SEA should consider all issues in relation to the aquatic environment during all aspects / phases in relation to the implementation of the Ammonia Strategy and Operational Protocol. Impacts that should be considered include, (but may not limited to), those relating to water quality,

water quantity, hydromorphology. Assessment should consider all potential impacts both direct and indirect. In addition to negative impacts Water Management Unit welcomes the inclusion of any positive impacts to the aquatic environment predicted.

It is important the SEA consider the potential for any transboundary impact to the aquatic environment in the Republic of Ireland. In cases where this is identified, cross border river basins should be given special attention as ecological functionality cross jurisdictional boundaries. NI/RoI migratory/mobile species such as salmon can be impacted by water quality / water quantity.

After consideration, the SEA should clearly state whether, or not, any potential impacts to the aquatic environment (including transboundary) have been identified and the nature of those impacts.

Plans and Programmes

River Basin Management Plans are the key tools for implementing the Water Framework Directive and to achieving its objectives. If the potential for impacts to the aquatic environment in Northern Ireland are identified, then the NI River Basin Management Plans must be considered during the SEA process.

DAERA has published the Draft River Basin Management Plan for the 3rd cycle period which runs from 2021-2027. The draft plan provides an update on the health of Northern Ireland's water environment (the status of water bodies) and sets out our targets (objectives) and actions (programme of measures) on how we want to improve our water environment in the next six years. The draft plan covers the North Western, Neagh Bann and North Eastern river basin districts (RBD) and includes detailed status updates on each RBD.

The documents can be downloaded from the consultation webpage: https://www.daera-ni.gov.uk/consultations/consultation-draft-3rd-cycle-river-basin-management-plan-2021-2027

Where the potential for transboundary impacts to the aquatic environment have been identified then due consideration must also be given to the relevant Irish River Basin Management Plans.

Legislation

There are several key pieces of environmental legislation relating to the Water Environment and its protection in Northern Ireland.

A list of this environmental legislation including links to each individual piece of legislation is available at

Water | NetRegs | Environmental guidance for your business in Northern Ireland & Scotland

Baseline Information.

Several useful information sources are available that highlight the current state of the environment in Northern Ireland at a regional level which could be referenced including the Northern Ireland Environmental Statistics Report the latest of which currently is dated May 2024.

Northern Ireland Environmental Statistics Reports: https://www.daera-ni.gov.uk/articles/northern-ireland-environmental-statistics-report

DAERA issued a consultation document on Significant Water Management Issues to inform the development of the third cycle River Basin Management Plan (2021-2027). This gives further consideration of the pressures and their sources on water quality in Northern Ireland. It should be noted that this document includes detail on the impact of agricultural activities to the aquatic environment.

Further details on this issue can be found at Planning for the third cycle River Basin Management Plan 2021-2027 - Consultation on Significant Water Management Issues December 2019 | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)

Also with regard to Northern Ireland Baseline Information and Data Sources DAERA have two map viewers in relation to the aquatic environment that may be of use, Water Information Request Web Viewer and NIEA Catchment Data Map Viewer both of which can be found at https://www.daera-ni.gov.uk/articles/daera-map-viewers

It is important that he most up to date information available is used in the formulation of the SEA.

Mitigation

Where adverse impacts on the aquatic environment are identified during the SEA process, and the nature of those potential impacts clearly identified, relevant and appropriate mitigation measures should be proposed. Mitigation measures must be proportionate to those risks identified.

Monitoring

Monitoring regimes should be identified (including where feasible, consideration of the monitoring body, frequency of monitoring, appropriate analysis, and reporting) to ensure both the efficacy of those mitigation measures and identify any unforeseen impacts to the aquatic environment that may arise from implementation of the Ammonia Strategy and Operational Protocol.

Marine Plan Team

The DAERA Marine Plan Team (MPT) welcome the opportunity to comment on the Ammonia Strategy and the New Operational Protocol, SEA Scoping Report.

The MPT understands the development of the combined SEA Report for the Ammonia Strategy and the New Operational Protocol is to assess the impacts of air pollution on the natural environment for Northern Ireland.

It had been previously recommended in the MPT response to the SEA Screening Report response on the draft Ammonia Strategy in 2021, to consider potential effects on the marine environment. This response is also attached for your information.

Scoping Question 1- Other Legislation, Plans and Programmes

It is observed that the Scoping Report has a strong land-based focus. Ammonia is very soluble in water and whilst the purpose of this Scoping Report is to assess the impacts of air pollution on the natural environment, MPT would recommend that this is extended to include impacts of water

pollution on the natural environment, including the marine environment. As a result, it is suggested that the following plans, policies and programmes should be considered:

- Marine and Coastal Access Act 2009;
- UK Marine Policy Statement 2011;
- Marine Act (Northern Ireland) 2013;
- Draft Marine Plan for Northern Ireland 2018;
- Integrated Coastal Zone Management Strategy for Northern Ireland 2006-2026; and
- UK Marine Strategy Regulations (2010).

This will enable your report to assess potential likely significant effects on the marine environment, including shared waters and loughs.

Scoping Question 3- SEA Themes, Objectives and Indicators

The SEA Environmental Report would benefit from stating if there are any likely effects or no likely effects on the Northern Ireland marine and coastal environment including but not limited to Northern Ireland's (marine) biodiversity, flora and fauna; water and soil; air quality; climatic factors (coastal processes/coastal erosion/flooding); cultural heritage and landscape (seascape). It is advised the SEA Topics and the SEA objectives are revisited to give further consideration to potential impacts on the marine environment and the nature of marine effects. Transboundary marine effects should also be given consideration.

Scoping Question 4- Baseline Information & Key Environmental Issues

It would be helpful if the baseline included information on:

- The achievement of good environmental status, in coastal and marine waters, as required under the UK Marine Strategy Regulations 2010. This includes issues such as impacts of noise, litter and certain aspects of biodiversity.
- The achievement of good status (ecological and chemical), for all coastal and surface waters, including all sea loughs, estuaries (transitional waters) and out to 1 nautical mile from the coast), as required under the Water Environment (Water Framework Directive) Regulations (NI) 2017
- It is recognised the benefit the strategy will have on human health and in protecting nature, however, consideration should be given to specifically including the protection of the marine environment.
- It is recognised that the strategy will reduce negative impacts from ammonia and nitrogen deposition on biodiversity, flora and fauna at designated sites, however, further consideration should also be given to potential impacts on marine biodiversity, marine protected sites and marine species etc.

Conclusion

The Ammonia Strategy and the new Operational Protocol highlights the impacts on the terrestrial environment. Taking account of the above advice will enable the subsequent Environmental Report to consider and assess likely effects on the marine environment of Northern Ireland, including transboundary marine effects. Further information can be found at:

- Marine Mapviewer | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)

- Northern Ireland Environmental Statistics Report 2024 | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)
- Seascape Character Areas | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)
- Marine Strategy | Department of Agriculture, Environment and Rural Affairs (daera-ni.gov.uk)
- NI Coastal Vulnerability Assessment Physical Assets - Datasets - Open Data NI
- Baseline Study and Gap Analysis of Coastal Erosion Risk Management NI | Department for Infrastructure (infrastructure-ni.gov.uk)

Marine Conservation Branch Response

SEA Scoping Report

Scoping Question 1 – Based on the plans and programmes outlined, relevant to the Ammonia Strategy and the Operational Protocol, is there any additional information that you think should be included, and why?

- Regarding Section 1.1.2, '*The main change proposed was removal of the spatially targeted measures around designation sites comprising the following mandatory measures around all internationally designated sites: - A prohibition on spreading manures within 50m of an internationally designated sites by January 2025. This aligns with the regulations in NAP which prohibit the spreading of organic manures or dirty water within 50m of a borehole.*' We advise also including a distance from the marine environment to prevent run off into coastal waters. However, we note this section continues to say '*The spatially targeted measures were not taken forward following consideration of stakeholder feedback and additional analysis carried out following this feedback by NIEA Air quality and Biodiversity Branch (NIEA AQBU), which confirmed the potential for unintended consequences.*' Therefore, we advise it would be beneficial to provide a summary of the unintended consequences in order to provided transparency and understanding of why these measures have not been taken forward.

- In Section 3, we advise also including Marine Conservation Zones (MCZ) which are designated under the Marine Act (Northern Ireland) 2013.

- In Table 1, we advise considering the following policies and legislation: *The Wildlife (Northern Ireland) Order 1985*, The Climate Change Act (Northern Ireland) 2022, The Marine and Coastal Access Act 2009, The Marine Strategy Regulations 2010, Marine Policy Statement 2011, The draft Marine Plan for Northern Ireland (consultation 2018), Marine Act (Northern Ireland) 2013 and An Integrated Coastal Zone Management Strategy for Northern Ireland 2006-2026.

Scoping Question 2. Do you agree with the geographical and temporal scope of the assessment?

- In Section 4.2, we welcome the following statement, *'The operational protocol will operate from now going forward until additional scientific and/or legal evidence emerges; at which point a review will take place in light of the new evidence.'*

Scoping Question 3. Do you agree with the themes, objectives and indicators set out in Table 4?

- In Table 4- BFF, we recommend ensuring that marine and intertidal habitats and species are considered.

- In Table 4 – Cultural heritage and Landscape, we advise considering Seascape.

Scoping Question 4. Have we identified the key environmental issues relevant to the Ammonia Strategy and Operational Protocol?

No comment.

Scoping Question 5. Do you agree with the proposed project timescales, and proposed consultees in the SEA process?

No comment.

Scoping Question 6. Can you propose any other data to be used in the SEA, and why it would be beneficial?

No comment.

Please contact the SEA Team at seateam@daera-ni.gov.uk should you have any queries or require clarification.

Yours faithfully,

Donna Whelan
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Countryside, Coast and Landscape
Northern Ireland Environment Agency
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Email :Liam.mcquillan@communities-ni.gov.uk
Naoimh.quinn@communities-ni.gov.uk

Date: 08/07/2024

HISTORIC ENVIRONMENT DIVISION COMMENTS RE: SEA SCREENING AND SCOPING REPORT FOR AMMONIA STRATEGY AND OPERATIONAL PROTOCOL

DfC Historic Environment Division (HED) operate via a Service Level Agreement with colleagues in DAERA in relation to SEA, whereby we provide authoritative comment and advice in relation to matters of Cultural Heritage including archaeological and architectural heritage. We make the following comments in respect of the documentation received by our office on 11/06/2024 and 05/07/2024.

HED concur with the finding of the screening report that SEA is required and provide the following comment in relation to the scoping report. HED advise that consideration should be afforded to relevant European Conventions around protection of archaeological heritage (Valletta Convention), architectural heritage, - (Granada Convention), and landscape (Florence convention). These feed down into our own various legislature and policies around protection and conservation of the historic environment.

We note the joint theme around landscape and cultural heritage in Table 4, - HED note that normally themes are separated out in the context of SEA assessment, but we advise that the objective here should be amended to reflect cultural heritage considerations as well – air and groundwater pollution, planting (including through proposed plantations) and construction all have the potential to have impacts to cultural heritage assets, e.g. through degradation and erosion activity, or destruction and disturbance, or impacts on setting. HED suggest separating the theme out, but if to be carried forward, we suggest a more comprehensive objective e.g. "Contribute to protection, **conservation** and enhancement of the landscape **and historic environment**....."

HED also advise that we would normally expect to see consideration of interrelationships between topic areas at scoping stage – we advise of the inter-relationship of the historic environment across of a range of topics including for example, landscape, biodiversity and water.

Finally HED advise reference to our Historic Environment Digital Datasets | Department for Communities (communities-ni.gov.uk) in formation of the report which will help in characterisation of the cultural heritage resource and understanding the spatial context in Northern Ireland. We also attach a link to our historic environment map viewer Historic Environment Map Viewer | Department for Communities (communities-ni.gov.uk).

If there are any queries about the content of this response, we can be contacted via the address above.

Yours sincerely,

Liam McQuillan MCIfA
Senior Archaeologist

Naoimh Quinn RIBA
Senior Architect

HERITAGE RECORDS AND DESIGNATIONS BRANCH

Appendix C - SEA Scoping Responses

NatureScot
NàdarAlba
Scotland's Nature Agency
Buidheann Nàdair na h-Alba

Dr Kate Semple
Ammonia and Nutrients Branch
Natural Environment Policy Division
Clare House, 303 Airport Road West,
Belfast, BT3 9ED

By e-mail: ammonia@daera-ni.gov.uk

Cc: sea.gateway@gov.scot; sea.gateway@hes.scot; sea_gateway@nature.scot; sea.gateway@sepa.org.uk

12 July 2024

Our ref: CEA175894 Your ref: none

Dear Kate Semple,

Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004:

Combined Strategic Environmental Assessment Scoping Report for DAERA's Operational Protocol and Ammonia Strategy.

Thank you for your scoping report consultation, sent to Fiona Rice at NatureScot on 11 June 2024. Our comments on the scope and level of detail to be included in the Environmental Report and on the duration of the proposed consultation period are set out below.

1. Based on the plans and programs outlined, relevant to the Ammonia Strategy and the Operational Protocol, is there any additional information that you think should be included, and why?

We note and commend the inclusion of the status of protected habitats in Northern Ireland. Information on features in favourable condition could be expanded to include pressures such as the number of features where reactive nitrogen deposition is identified. From a nature conservation perspective, we appreciate the focus to target action around protected sites; however, given transboundary export of reactive nitrogen to Scotland we would not want this to be to the detriment of reducing overall emissions.

2. Do you agree with the geographical and temporal scope of the assessment?

The most recent reactive nitrogen deposition estimates to Scotland from Ireland are 5.0 kt per year, of which 4.3 kt is estimated to be in the reduced form, NHx.[1] We therefore agree that Scotland should be included in the geographic scope of the assessment.

[1] Carnel *et al.*, 2021, Nitrogen deposition in Northern Ireland and import/export of N deposition across the UK. CEH Report number 07102/ Issue number 1.

3. Do you agree with the themes, objectives and indicators set out in Table 4?

Biodiversity, fauna and flora – in this theme the focus is on monitoring the pressure. We would recommend monitoring the impacts on the anticipated reduction in nitrogen emissions. It is well documented that due to hysteresis, recovery from extended periods of excessive nitrogen deposition can be slow, therefore additional site-based management may be required to return features to favourable condition even after reactive nitrogen deposition has been removed as a pressure.[2]

Water and Soil – again the focus is entirely on the pressure rather than the impact. We would again commend monitoring changes in biodiversity particularly with respect to soil microbial function.

4. Have we identified the key environmental issues relevant to the Ammonia Strategy and Operational Protocol?

In addition to vegetation analysis in the form on tissue nitrogen, we would recommend assessing both floristic composition and soil microbial composition.

5. Do you agree with the proposed project timescales, and proposed consultees in the SEA process?

NatureScot notes that a period of eight weeks is proposed for consultation on the Environmental Report and is content with this proposed period.

6. Can you propose any other data to be used in the SEA, and why it would be beneficial?

We would draw attention to the growing body of evidence being developed in a Scottish context through the Nitrogen Impacts in Natural Ecosystems (NINE) project within the Scottish Government Environment, Natural Resources and Agriculture Research Programme.

Concluding remarks

I hope that these points are of assistance to you. Please note that this response is in the context of Regulation 4 of the SEA Regulations (NI) and our role as statutory consultees given the transboundary nature of ammonia emissions. We understand that we will be separately consulted on our views regarding the Environmental Report.

Should you wish to discuss any of the comments detailed in this response, please do not hesitate to contact Sue Marrs at sue.marrs@nature.scot.

Yours sincerely,

(Dr) Katherine Leys, Head of Biodiversity and Geodiversity

[2] *Inter alia* Britton *et al*., 2023. Nitrogen mitigation: A review… https://www.hutton.ac.uk/sites/default/files/files/Nitrogen-Mitigation-Potential-In-Scotland-Report.pdf

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Dr Kate Semple
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BT3 9ED
Northern Ireland

16th July 2024 Our Ref: SCP240602.1

Re. SEA Scoping Report for DAERA's Operational Protocol and Ammonia Strategy

Dear Dr Semple,

We acknowledge your notice, dated 11th June 2024, in relation to the Operational Protocol ('the Protocol') and Ammonia Strategy (the 'Strategy') and associated Strategic Environmental Assessment (SEA) Scoping.

This submission is not part of a formal transboundary consultation process under the SEA Directive, which may follow at the Draft Strategy/Protocol stage. Our comments and observations are provided in the context of ongoing cooperation and discussion between the EPA and plan making authorities in Northern Ireland.

We welcome the opportunity to provide input at this stage of the Strategy/Protocol and SEA process. Some general comments are provided below, while we provide comments on the SEA process in Appendix I. Appendix II includes responses to the questions posed in the scoping report are set out in Appendix I.

We may provide further observations, as appropriate, at the Draft Strategy/Protocol/ SEA Environmental Report stage in the process.

Comments on the Strategy/Protocol

Water Quality

In the Republic of Ireland, Ireland's 5th Nitrates Action Programme 2022-2025 is designed to prevent pollution of surface waters and groundwaters from agricultural sources as well as to protect and improve water quality. This would be useful programme to acknowledge, from a transboundary perspective. While the ecological health of our waterways appears to be stabilising, the levels of nutrients in our waters is still too high.

Integration of the SEA and the Strategy/Protocol

The integration of the SEA process into the Strategy/Protocol should reflect the overall objective of the SEA Directive "*to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes*".

The SEA should acknowledge the complex and cross cutting nature of climate and biodiversity issues and include targets and measures, where relevant and appropriate, that can tackle our shared climate crisis, as part of an integrated approach to tackling environmental problems.

All recommendations from the SEA and AA processes, including mitigation measures and monitoring proposals, should be integrated into the Strategy/Protocol. We recommend that the Strategy/Protocol include summary tables outlining the key findings of the SEA and linking the significant environmental effects identified to the proposed mitigation measures, monitoring programme and Strategy/Protocol actions/measures.

Fully integrating the findings and recommendations of the SEA into the Strategy/Protocol will be key to strengthening its overall positive commitments while ensuring that any potential significant adverse effects of implementing the Strategy/Protocol are suitably mitigated.

The SEA Environmental Report and the Strategy/Protocol should include a chapter outlining how the recommendations and mitigation measures from the SEA have been incorporated into the Strategy/Protocol. We recommend that the SEA Environmental Report includes summary tables outlining the key findings of the SEA and linking the significant environmental effects identified to the proposed mitigation measures, monitoring programme and, where relevant, Strategy/Protocol actions/commitments/measures.

State of the Environment Report – Ireland's Environment 2024

The EPA will be publishing the next iteration of our State of the Environment Report, published every four years, later in 2024. Once published, this report should be an informative resource to consider, in finalising and implementing the Strategy/Protocol over its lifetime.

If you have any queries or need further information in relation to this submission, please contact Cian O'Mahony at c.omahony@epa.ie. I would be grateful if you could send an email confirming receipt of this submission to: sea@epa.ie.

Yours sincerely,

Cian O'Mahony
SEA Section
Office of Evidence and Assessment

Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

Dr Kate Semple

Department of Agriculture, Environment and Rural Affairs

By email only to: ammonia@daera-ni.gov.uk

Our Ref: PCS-20002335
Your Ref:

SEPA Email Contact:
Sea.gateway@sepa.org.uk

22 July 2024

Dear Kate Semple,

Environmental Assessment of Plans and Programmes (Northern Ireland) 2004 Combined Strategic Environmental Assessment Scoping Report for DAERA's Operational Protocol and Ammonia Strategy

Thank you for your scoping consultation submitted under the above Regulations.

This response is in the context of Regulation 4 of the SEA Regulations (NI) and our role as a statutory consultee given the potential transboundary effects. We have considered the document submitted and comment as follows in respect of the scope and level of detail to be included in the Environmental Report (ER).

1. **Based on the plans and programmes outlined, relevant to the ammonia Strategy and the Operational Protocol, is there any additional information that you think should be included, and why?**

Chair
Lisa Tennant

CEO
Nicole Paterson

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In general, we consider that the plans and programmes outlined cover the main issues relevant to the strategy. However additional data may include the Nitrogen Futures Project from JNCC and the Scottish Nitrogen Balance sheet that may provide information on imported N within Scotland from NI source.

Minor typo - Page 20 under Relationship with the Ammonia Strategy – "This will lead to a reduction in the Critical Levels and Critical Loads at ASSIs" should read "This will lead to a reduction in the ***exceedance of*** Critical Levels and Critical Loads at ASSIs".

2. **Do you agree with the geographical and temporal scope of the assessment?**
   Geographical scope

   The scope of the assessment looking at national and regional measures and having regard to transboundary effects is logical. However the effects of adoption of measures in the Ammonia Strategy local to monitored and modelled designated sites is likely to have a large site-specific effect, so the local scale may need to be considered to explain variation in the indicator values.

   Temporal scope

   The 6 year scope of the Ammonia Strategy may make it difficult to detect significant effects on the ammonia concentrations due to newly designed and planted tree plantations, given the likely time required for the shelter belt woodlands to grow and close their canopy to provide a valuable service of scrubbing ammonia from the air travelling through it. Many of Northern Ireland's designated sites are protected for peatland features which rely on a high water table to be in good condition; when designing a tree plantation to protect sites from ammonia the effect of the trees on the hydrology of the protected peatland should be considered if in close proximity (trees with high rates of evapotranspiration will lower the water table). Wet conditions, which are good for the peatland, will also limit which tree species will thrive to form a useful filter and backstop in the shelter belt. The CEH Tree Shelter Belts for Ammonia Mitigation ammonia reduction calculator tool can be used to

predict the percentage ammonia recapture from planting to maturity for a given location (climate variables), soil type, tree species and plantation design.

It is noted that the Ammonia Strategy will be reviewed in 2026, it would be useful to consider the following questions;

- What degree of reduction in agricultural ammonia emissions and of designated sites' ammonia concentrations and nitrogen deposition rates would be considered significant?

- What is the range of potential effect?

- What scope will there be to strengthen measures if little effect is detected in the indicators by the Ammonia Strategy review point in 2026?

3. **Do you agree with the themes, objectives and indicators set out in Table 4?**
4. **Have we identified the key environmental issues relevant to the Ammonia Strategy and Operational Protocol?**

The current status of waterbodies in Northern Ireland should be added as a baseline indicator, specifically looking at measures of nutrient enrichment including nitrate concentration and ecological effects.

Effects of the strategy on water quality should be included in the environmental issues. The water and soil theme in Table 4 should directly address water pollution from agricultural ammonia. Water chemistry, ecological effects, blue-green algae should be included in the indicators, which are likely to be available from WFD monitoring.

In Table 4, under Climatic factors, to evaluate impact to the carbon storage ecosystem function add in an objective to improve sphagnum cover and hydrology at peatland bog sites to reduce carbon losses and retain stored carbon, supported by an indicator of sphagnum areal coverage and water table depth at the monitoring

sites. Vegetation analysis of tissue nitrogen concentration at these sites would also be welcome to better understand where ammonia concentration and deposition do not track together.

For SEA themes of a) biodiversity, fauna and flora and b) water and soil, the objective is to reduce biodiversity loss however no measures of biodiversity are proposed as indicators; suggest that vegetation quadrat surveys are conducted at the monitoring sites with analysis of measures of biodiversity (including species richness, evenness, positive indicator species, negative indicator species) to provide evidence of whether this objective has been met.

Under the Air section and considerations there should be a consideration of monitoring and modelling the impacts on transboundary PM from NI to the rest of the UK.

You may want to consider consulting Natural England and the Environment Agency given the transboundary nature of secondary PM and the fact that Northwest England will be affected by ammonia polluted air mass from NI.

5. **Do you agree with the proposed project timescales, and proposed consultees in the SEA process?**

We are satisfied with the proposal for a 8 week consultation period for the Environmental Report. In this case we will not be providing a detailed assessment of the Environmental Report.

If you have queries relating to this letter, please contact us via our SEA Gateway at sea.gateway@sepa.org.uk including our reference number in the email subject.

Your sincerely,
Lorna MacLean
Principal Policy Officer

Planning Service

Ecopy to: sea_gateway@nature.scot sea.gateway@hes.scot

Disclaimer: This advice is given without prejudice to any decision made on elements of the proposal regulated by us, as such a decision may take into account factors not considered at this time. We prefer all the technical information required for any SEPA consents to be submitted at the same time as the planning or similar application. However, we consider it to be at the applicant's commercial risk if any significant changes required during the regulatory stage necessitate a further planning application or similar application and/or neighbour notification or advertising. We have relied on the accuracy and completeness of the information supplied to us in providing the above advice and can take no responsibility for incorrect data or interpretation, or omissions, in such information. If we have not referred to a particular issue in our response, it should not be assumed that there is no impact associated with that issue. For planning applications, if you did not specifically request advice on flood risk, then advice will not have been provided on this issue. Further information on our consultation arrangements generally can be found on our website planning pages - www.sepa.org.uk/environment/land/planning/

For further information:

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