Department for Infrastructure

Strategic Environmental Assessment (SEA) Scoping Report

Strategic Planning Policy on Renewable & Low Carbon Energy

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Author	Poppy Grange, Sofija Semjonova	**Technical reviewer**	Rob Edwards & Nisha Rehm
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APPENDICES

TERM	DEFINITION
AA	Appropriate Assessment
AONB	Area of Outstanding Natural Beauty
AQMAs	Air Quality Management Areas
CBD	Convention on Biological Diversity
CCRA	Climate Change Risk Assessment
CEH	Centre for Ecology and Hydrology
CMP	Conservation Management Plans
DAERA	Department of Agriculture Environment and Rural Affairs.
DARD	Department of Agriculture and Rural Development's
DOE	Department of Environment
EFS	Environmental Farming Scheme
EPA	Environmental Protection Agency
ES	Ecosystem Services
ESAS	Environmentally Sensitive Areas Scheme
EU	European Union
GHG	Greenhouse Gas
GI	Green Infrastructure
GIS	Geographic Information Systems
LAC	Local Authority Collected
LCA	Landscape Character Assessment
LSE	Likely Significant Effects
MCZ	Marine Conservation Zones
MDM	Multiple Deprivation Measure
MLA	Member of the Legislative Assembly
MPA	Marine Protected Areas
MarPAMM	Marine Protected Area Management and Monitoring
NAP	Nitrates Action Programme
NHA	Natural Heritage Area
NI	Northern Ireland
NI BAP	Northern Ireland Biodiversity Action Plan
NIEA	Northern Ireland Environment Agency
NISRA	Northern Ireland Statistics and Research Agency
NISMR	Northern Ireland Sites and Monuments Record
OECD	Organisation for Economic Co-operation and Development
OFS	Organic Farming Scheme
ODPM	Office of the Deputy Prime Minister
PO	Policy Objective

RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SDC	Sustainable Development Council
SDG	Sustainable Development Goals
SEA	Strategic Environmental Assessment
SWPA	Shellfish Waters Protected Areas
SPA	Special Protection Area
SONI	System Operator for Northern Ireland
SPPS	Strategic Planning Policy Statement
UK	United Kingdom
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WHS	World Heritage Site
WRZ	Water Resource Zones

1 INTRODUCTION

1.1 Purpose of this Report

RSK has been instructed by the Department for Infrastructure (hereafter referred to as 'the Department') to carry out a Strategic Environmental Assessment (SEA) of the Renewable Energy policy from the Strategic Planning Policy Statement (SPPS) for Northern Ireland (NI). Hereafter this will be referred to as 'the Policy'.

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, with a view to promoting sustainable development. The process of SEA was introduced under European Directive 2001/42/EC12 on the assessment of the effects of certain plans and programmes on the environment (SEA Directive) and came into force in 2001.

The requirements of the SEA Directive are 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'. Also of relevance are the Environmental Assessment of Plans and Programmes Regulations 2004 (SI 1633/2004) (the UK Regulations) and, in Ireland, the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (Irish SI 435/2004 and SI 200/2011), and the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (Irish SI 436/2004 and as amended by SI 201/2011).

The Northern Ireland Regulations require the Department, as the programming authority, 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*".

Due to the withdrawal of the United Kingdom from the European Union (EU), The Environmental Impact Assessment (Amendment) (Northern Ireland) (EU Exit) (no.2) Regulations 2019 came into force. This instrument made necessary changes, which have arisen as a result of the UK leaving the EU, to domestic legislation which governs the process for SEA. This instrument made minor and technical changes to ensure that the above legislation works sensibly in a UK-only context. The instrument makes no substantive changes to the way the existing legislation operates and all of the changes only make technical drafting fixes required to maintain a continuity of approach following exit from the EU.

Scoping is the process of determining the range and level of detail of the environmental issues to be taken forward in the SEA. The scope of the SEA depends on what is being proposed within the plan or programme, its geographical and temporal coverage, and the nature of the receiving environment. The scoping process also identifies the methods to

be used, the organisations and/or individuals to be consulted during the assessment, and the timing and length of the consultation period.

The aim of this Scoping Report is thus to set the scope of the work to be included in the SEA, and to provide a framework for the Environmental Report which will form the main output of the SEA process.

1.2 Purpose and Structure of this Report

This Scoping Report is designed to set the context of the SEA and to invite the opinions of consultees on the proposed methods, scope and areas of focus.

The areas considered in this scoping report, and their location in the report, are as follows:

- Summary of the review of Strategic Planning Policy on Renewable & Low Carbon Energy policy – Section 1.3;
- Spatial and temporal scope – Section 2.4;
- Identification of other plans, programmes and environmental protection objectives to be assessed against the SPPS – Section 2.6;
- Summary of baseline environmental data – Chapter 3;
- Identification of key environmental and sustainability issues in NI – Section 3.12;
- Setting of draft SEA objectives – Chapter 4;
- Consideration of alternatives – Section 5.1;
- Identification of likely significant impacts – Section 5.2; and
- Scoping of topics to be considered in the SEA – Section 5.3.

1.3 The Strategic Planning Policy Statement: Review of Strategic Planning Policy on Renewable & Low Carbon Energy

On 1 April 2015, the former Department of Environment (DOE) transferred responsibility for the majority of planning functions to 11 new councils. To support the move to the new two tier planning system, the Strategic Planning Policy Statement (SPPS) was published in September 2015. The SPPS entailed the consolidation of some twenty policy publications into one document, setting out strategic planning policy in relation to a wide range of subject policies. The SPPS provides a shorter, simplified and accessible statement of planning policy for users of the planning system. It also provides the core planning principles to underpin delivery of the two-tier planning system with the aim of furthering sustainable development. It sets the strategic direction for the new councils to bring forward detailed operational policies within future local development plans.

The current policy approach in the SPPS in relation to renewable energy is “to facilitate the siting of renewable energy generating facilities in appropriate locations within the built and natural environment in order to achieve NI’s renewable energy targets and to realise the benefits of renewable energy without compromising other environmental assets of acknowledged importance.” (Paragraph 6.218).

Following a Ministerial commitment to undertake reviews of ‘Development in the Countryside’ and ‘Renewable Energy’ in 2015, the Department issued a ‘Call for Evidence’ for both policy areas in March 2016. Independent consultants were

commissioned in March 2017 to carry out research to inform the way forward. The research paper for 'Renewable Energy' is as described below in Section 1.3.1.

Due to the collapse of the NI Assembly between January 2017 and January 2020, the Department was unable to progress the policy review beyond this point, in the absence of Ministerial direction and agreement. However, on 21 April 2021, former Infrastructure Minister, Nichola Mallon announced her decision to review strategic planning policy on renewable and low carbon energy which allowed the SEA process on the SPPS' Renewable & Low Carbon Energy Policy to recommence. It is worth noting that a review of strategic planning policy for 'Development in the Countryside' is not being taken forward at this time.

The aim of this review is to ensure that strategic planning policy on renewable & low carbon energy development remains fit for purpose and up-to-date to inform decision-making in relation to development proposals for this subject area. It is also intended to inform the local development plan (LDP) process and enable plan-makers to bring forward appropriate local policies, all within the wider contemporary context for energy and the climate emergency.

On 15 December 2021, the Department circulated an Issues Paper to a range of key stakeholders to assist inform the review of renewable & low carbon energy. The responses received to this latest engagement exercise will also help inform the way forward for this policy area and it is the Department's intention to issue a draft revised policy document for full public consultation in 2022.

Renewable Energy Research

Element Consultants Ltd were commissioned by the Department in March 2017 and prepared a research report in relation to the 'Review of Strategic Planning Policy on Renewable Energy'. The report carried out a review of renewable energy technologies and their trends, existing policies in the North and South of Ireland, and in the wider British Isles and included targeted stakeholder consultation.

The Department will take account of the findings of the research report in the review. The review will consider new technologies and approaches to renewable & low carbon energy development which will be taken into account in decision making and by councils as they continue to develop local planning policies through their Local Development Plans. It is expected that the research report will be published at the public consultation stage of the policy development process.

Geographic Coverage

The geographic area covered by the renewable & low carbon energy policy from the SPPS comprises the whole of NI. The reform of local government in April 2015 saw the reduction of 26 councils to 11.

1.4 Characterisation of the Area

NI is one of four administrative regions of the UK. It is a predominantly a rural region, with 75% of the landmass in agricultural use. Almost two fifths of the urban population live within the Belfast Metropolitan Area with another sizeable concentration of population

around Derry/Londonderry. The region has a distinctive cultural heritage and retains strong rural dimensions through the importance of agriculture, tourism and their interactions with the landscape.

The population of NI in mid-2020 was estimated at 1,895,500 (Northern Ireland Statistics and Research Agency (NISRA), 2020). The first release of Census 2021 statistics will be published by June 2022 and will be available via the NISRA website.

Table 1.1 below provides statistics on the land area, population size and population density of the new local government districts as well as for NI as a whole.

Table 1.1: Area and Population of Northern Ireland (data from Local Government Estimates in the NISRA 2020[1] statistical bulletin)

Local Authority District	Area (km^2)	Population (mid-2020)	Population Density (people/km^2)
Antrim and Newtownabbey	571	143,800	252
Armagh, Banbridge and Craigavon	1,399	217,200	161
Belfast	109	342,600	2,553
Causeway Coast and Glens	1,980	144,900	73
Derry and Strabane	1,237	151,100	122
Fermanagh and Omagh	2,847	117,300	41
Lisburn and Castlereagh	527	146,500	291
Mid and East Antrim	1,046	139,400	133
Mid Ulster	1,848	149,000	82
Newry, Mourne and Down	1,541	181,700	112
North Down and Ards	458	162,100	354

NI has 650 km of coastline, the majority of which is protected for its special interest and a number of coastal species and habitats are recognised as internationally important. There are a number of nature conservation, landscape and cultural heritage designations in NI. These are designated as either statutory (protected by law) or non-statutory (a material planning consideration), and can be of international, national or local importance. Information on local and/or non-statutory designations is held by individual local authorities and has not been obtained for this strategic level assessment.

The number of statutory nature conservation, landscape and cultural heritage designated sites in NI are provided in Table 1.2 below (obtained from NI Environmental Statistics Report (Northern Ireland Environment Agency (NIEA) and Department of Agriculture, Environment and Rural Affairs (DAERA), 2021 and various Geographic Information Systems (GIS) data sets). Further details on designated sites are provided in Chapter 3.

[1] https://www.nisra.gov.uk/publications/2020-mid-year-population-estimates-northern-ireland

Table 1.2: Designated Sites in Northern Ireland (NIEA and DAERA 2021)

Designations	Number
Special Protection Areas (SPA)	7
Special Areas of Conservation (SAC)	57
Ramsar sites	21
Areas of Special Scientific Interest (ASSI)	394
National Nature Reserves (NNR)	12
World Heritage Sites	1
Scheduled Monuments	2,008
Monuments in State Care	189
Listed Buildings	8,994
Historic Parks, Gardens and Demesnes	700+
Shipwrecks	1
National Parks	0
Areas of Outstanding Natural Beauty (AONB)	9

2 APPROACH TO THE SEA

2.1 Best Practice Guidance

Our SEA approach takes into account the procedures provided under the following guidance documents:

- European Commission (2003), 'Implementation of SEA Directive (2001/42/EC): Assessment of the Effects of Certain Plans and Programmes on the Environment';
- EC (2013) Guidance on Integrating Climate Change and Biodiversity into Strategic Environmental Assessment;
- Office of the Deputy Prime Minister (ODPM), Scottish Executive, Welsh Assembly Government and DOE (2005), 'A Practical Guide to the Strategic Environmental Assessment Directive';
- Northern Ireland Environment Agency (2009), 'Strategic Environmental Assessment: Consultation Bodies' Services and Standards for Responsible Authorities';
- Environmental Protection Agency (EPA) (2020) SEA Pack
- EPA (2020) Good Practice Guidance on Cumulative Effects Assessment in SEA
- EPA (2020) Guidance on SEA Statements and Monitoring
- EPA (2019) Integrating Climatic Factors into the Strategic Environmental Assessment Process in Ireland;
- EPA (2019) Good Practice note on SEA for the Forestry Sector
- EPA (2015) Developing and Assessing Alternatives in Strategic Environmental Assessment;
- EPA (2013) Integrated Biodiversity Impact Assessment – Streamlining AA, SEA and EIA Processes: Practitioner's Manual.
- EPA (2003) Development of Strategic Environmental Assessment (SEA) Methodologies for Plans and Programmes in Ireland - Synthesis report;
- United Nations Economic Commission for Europe (2012) 'Resource Manual to Support Application of the Protocol on Strategic Environmental Assessment'.
- Department of Health (2007), 'Draft Guidance on Health in Strategic Environmental Assessment';
- Levett-Therivel, Environment Agency, Countryside Council for Wales, UKCIP, Natural England, InteREAM, and CAG Consultants (2007), 'Strategic Environmental Assessment and Climate Change: Guidance for Practitioners'; and
- Countryside Council for Wales, English Nature, Environment Agency and RSPB (2004), 'Strategic Environmental Assessment and Biodiversity: Guidance for Practitioners'.

2.2 The SEA Process

The SEA Guide produced by the ODPM (now Ministry of Housing, Communities and Local Government), Welsh Assembly Government and DOE in 2005, in common with other SEA guidance documents, sets out a five stage process for carrying out SEA. These stages are summarised in Table 2.1 below.

Table 2.1: Stages in the SEA Process

Stage	Tasks
Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope	A1: Identifying other relevant plans, programmes and environmental protection objectives
	A2: Collecting baseline information
	A3: Identifying environmental problems
	A4: Developing SEA objectives
	A5: Consulting on the scope of SEA
Stage B: Developing and refining alternatives and assessing effects	B1: Testing the plan or programme objectives against the SEA objectives
	B2: Developing strategic alternatives
	B3: Predicting the effects of the plan or programme, including alternatives
	B4: Evaluating the effects of the plan or programme, including alternatives
	B5: Mitigating adverse effects
	B6: Proposing measures to monitor the environmental effects of plan or programme implementation
Stage C: Preparing the Environmental Report	C1: Preparing the Environmental Report
Stage D: Consulting on the draft plan or programme and the Environmental Report	D1: Consulting the public and Consultation Bodies on the draft plan or programme and the Environmental Report
	D2: Assessing significant changes
	D3: Making decisions and providing information
Stage E: Monitoring the significant effects of implementing the plan or programme on the environment	E1: Developing aims and methods for monitoring
	E2: Responding to adverse effects

This Scoping Report (Stage A) is intended to provide sufficient information about the SPPS Renewable & Low Carbon Energy Policy and its potential environmental effects to allow the Consultation Authorities to provide an informed response in regard to the environmental topics to be included in the SEA.

Comments from the Consultation Authorities on this Scoping Report will be responded to in the draft Environmental Report (the next stage of SEA). Chapter 6 discusses in more detail the subsequent stages and outputs of the SEA process that will be carried out following the conclusion of Stage A.

2.3 Sustainability Topics

The baseline data, key environmental issues and SEA Objectives have been presented through a series of sustainability topics derived from the Northern Ireland Regulations, namely: biodiversity, flora and fauna; population; human health; soil; water; air; climatic

factors; material assets; cultural heritage (including architectural and archaeological heritage); landscape; and the inter-relationship between these.

The topics considered in the SEA will be in accordance with these requirements, updated to align more closely with the requirements of the SPPS, and expanded for clarity (see Table 2.2 below). In order to address concerns on the effects that human activities have had across the sustainability topics, we have included an additional sustainability topic, Natural Capital as a means of assessing the interrelationship of all other factors.

Table 2.2: Sustainability Topics

Sustainability Topic	Sub-Topics	Relevant Topic in SEA Directive
Ecology and Nature Conservation	Internationally and nationally designated sites (including those in the marine area) Locally designated sites and priority habitats Protected and priority species Biodiversity outside designations Ecological networks and connectivity	Biodiversity Flora and fauna
Population: Socio-economics	Accessibility to education, employment, housing and community facilities/services Deprivation, inequality and exclusion Crime and road safety Population size, density and structure	Population
Population: Health and Quality of Life	Health and wellbeing Walking, cycling and access to greenspace Health deprivation Noise and vibration	Human health Population
Soil and Land Use	Soil and agricultural land quality Provision of land-based goods and services Previously developed and contaminated land Carbon storage and water attenuation Geology (including designated sites)	Soil
Water	Water resources and availability Water quality Flood risk Internationally and nationally designated sites in the marine area	Water
Air Quality	Air pollution (both national and local levels) Travel and transport	Air
Climate Change	Energy conservation and efficiency Renewable energy Sustainable transport Adaptation to relevant climate change risks and opportunities, such as flooding and global warming, sea temperature rise Protection of habitats which act as carbon	Climatic factors

Sustainability Topic	Sub-Topics	Relevant Topic in SEA Directive
	Stores	
Material Assets	Natural resources including minerals Material recovery, re-use and recycling Waste generation and disposal	Material assets
Historic Environment	Designated and non-designated sites, buildings and areas Archaeological assets Quality and character of townscape / villagescape	Cultural heritage (including architectural and archaeological heritage)
Landscape	Quality and character of landscape, seascape and coastal areas Designated and other important sites (including greenspace) Visual aesthetics Light pollution	Landscape
Natural Capital	Connectivity and multifunctionality of green and blue spaces including ecological networks Provisioning services that GI provides, e.g. food, fuel, freshwater and marine Regulating services that GI provides, e.g. control of natural processes such as soil, air and water quality and climate regulation Cultural services that GI provides, e.g. recreational, educational and ethical benefits Supporting services that GI provides e.g. habitat and natural cycles	The inter-relationship between these

2.4 Spatial and Temporal Scope

The spatial scope for the assessment is all of NI. As required by the Northern Ireland Regulations, the assessment will also take into account trans-boundary impacts where it is identified that actions taken under the Renewable & Low Carbon Energy policy have the potential to impact on the topic areas identified in other states, particularly the ROI. Consideration of trans-boundary impacts is likely to be particularly relevant with some of the environmental topics that transcend national boundaries, for example ecology, climate, air, water, cultural heritage and landscape.

There is no specific temporal scope. With certain aspects of the environment such as climate, ecology and landscape, any positive or negative impacts associated with the emerging Renewable & Low Carbon Energy Policy area may take effect over a time period of many decades. For this reason, a longer term view will be taken on potential impacts rather than seek to set a fixed temporal scope.

2.5 Assessment of Alternatives

Consideration of alternatives is a fundamental part of the SEA process as defined by NI SEA Regulations. In practical terms, it refers to possible alternative mechanisms for delivering the emerging renewable & low carbon energy policy, and the assessment of the impacts of each of these options against the SEA objectives.

A number of alternatives are being developed and will be defined and assessed at the SEA Environmental Report stage. Further consideration to the assessment of alternatives is given in Section 5.

2.6 Other Plans, Programmes and Conservation Objectives

Assessing the relationship of the emerging renewable & low carbon energy policy with the existing international and national framework of plans and programmes and identifying gaps and conflicts is a key part of the SEA process. The SEA will assess the implications and in combination effects of any current policy with the emerging renewable & low carbon energy policy within the SPPS. This includes the consideration of statutory and non-statutory environmental protection objectives.

The plans and programmes that have been considered are listed in full in Appendix A.

In many cases, the emerging renewable & low carbon energy policy is expected to support the other plans and programmes through similar objectives. Other plans and programmes with environmental protection objectives that the policy could support will be considered further at the next stage of the process.

3 BASELINE DATA

3.1 Information Requirements

Schedule 2 of the NI SEA Regulations 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 description of the current state of the environment in NI, with respect to each of the sustainability topics, is provided below. Where appropriate, GIS has been used to assist with analysis of this data; maps have been produced to display relevant spatial information and can be seen in Appendix B.

Analysis of baseline information has been carried out to provide an evidence base for current and likely future environmental conditions. Key environmental and sustainability issues for NI have also been identified.

Information for this section has been obtained from the former DOE, NIEA and NISRA websites.

3.2 Ecology and Nature Conservation

NI has a large area of land of international nature conservation value, including 17 Special Protection Areas (SPAs) designated under the EC Birds Directive (8 of which are designated for marine components); 57 Special Areas of Conservation (SACs) designated under the EC Habitats Directive (8 of which with marine components); and 21 Ramsar sites designated under the Convention on Wetlands (8 with marine components) (NIEA and DAERA, 2021). SPAs and SACs are known collectively as the UK's national site network. A map showing international nature conservation designations across NI can be seen in Appendix B.

A proportion of Natura 2000 sites are still in poor condition, however, the DAERA is currently funding the production of 57 Natura SACs individual Conservation Management Plans (CMPs). There are plans in place to have CMPs progressed for all SACs by the end of 2022. NI hosts 50 habitat types of Annex I and 18 species of Annex II under the Habitats Directive; as well as all species of bats, all marine mammals and 6 other species of Annex IV (NIEA and DAERA, 2013).

As of March 2021, NI has 394 ASSI's comprising a total of 111,159 ha, defined as being NI's very best wildlife and geological sites. Similarly to 2019, approximately 35% of ASSI features are in unfavourable condition as of 2020, 62% are in favourable condition and 4% in an unfavourable condition but recovering (NIEA and DAERA, 2020). When further

divided into biological and earth science features assessed, 55% of biological features were in favourable condition, compared to 96% of earth science features in favourable condition (NIEA and DAERA, 2020). A map showing national nature conservation designations across NI can be seen in Appendix B.

The DAERA has been working towards the creation of an ecologically coherent network of terrestrial and marine protected areas, and the focus between 2018 and 2022 has been on bringing the protected sites network into favourable management. The total terrestrial protected sites have demonstrated an increase from 1,384 km^2 in 2009/10 to 1,494 km^2 in 2020/21. In both 2020/2021 the proportion of terrestrial protected sites under favourable management has increased since 2015/2016, from 2.63 km^2 to 304.83 km^2 (NIEA and DAERA, 2021). The total marine protected area increased from 269 km^2 in 2009/10 to 2,410 km^2 in 2020/21. DAERA Marine and Fisheries Division has designated four new Marine Conservation Zones (MCZs) in the NI Inshore Region, with another in progress, in addition to the existing MCZ Strangford Lough (DAERA, 2021). The proportion of protected habitats in NI under favourable management has demonstrated an increase of 370% from the baseline data of 86.25 km^2 in 2016, to 319.83 km^2 in 2019/2020 (DAERA, 2021).

The Northern Ireland Biodiversity Action Plan (NI BAP), in addition to implementing UK-wide biodiversity priorities in NI, identifies habitats and species that are of particular importance in the NI context. NI has a special responsibility as it is at the western edge of the range of European habitats and species. Such habitats include lowland raised bog, blanket bog, montane heath and fen. Species identified as being particularly important in NI include the Irish Hare (*Lepus timidus hibernicus*), Chough (*Pyrrhocorax pyrrhocorax*), Curlew (*Numenius arquata*) and Red Squirrel (*Sciurus vulgaris*).

In June 2015, the DOE published “Valuing Nature – A Biodiversity Strategy for Northern Ireland to 2020.” setting out 57 actions to aid biodiversity conservation efforts. The 2015 strategy identified the main problems facing the NI environment as agricultural intensification, pollution, the spread of invasive species, over- and/or under-grazing, the spread of urban development and associated infrastructure and climate change.

The 2020 progress report states that there have been many positive outcomes during the lifespan of the Strategy, 32 actions had been achieved, 22 were partially achieved and 3 were not actioned. Actions that have not been taken forward due to other priorities and lack of resources, are likely to be considered as part of any new Biodiversity strategy published. It is cited that COVID-19 made some of the actions unachievable. The Strategy acknowledged that a more integrated approach is required rather than focus solely on designated sites. A key factor in the improved environmental performance is wider societal participation in supporting biodiversity; over 5000 farms are involved in the Environmental Farming Scheme (EFS), schools are now participating in eco-schools initiatives and increase in public participation such as volunteering, despite being affected by COVID-19 restrictions, all have demonstrated year on year growth.

The Convention on Biological Diversity (CBD) is focusing on reviewing their targets for the period 2020 – 2030. The proposed post 2020 Global Biodiversity Framework will focus on the period up to 2030 and includes 21 draft targets.

Between 1994 and 2018, the average population change amongst 37 surveyed breeding bird species for which the Breeding Bird Survey produces statistically robust results in NI

demonstrated a 50% increase. Whereas 17 of the 37 species have shown a statistically significant increasing trend while only two, Skylark and Greenfinch, have displayed a significant long-term decline. The long-term 1,305% increases in Buzzard and 1,540% increases in Blackcap are particularly dramatic. Buzzards have significantly benefitted from lower persecution and reduced use of persistent pesticides since the 1970s, while the increase in Blackcap numbers in NI can likely be attributed to a combination of earlier laying, climate change and a general increase and north-western spread of the breeding population in Great Britain (NIEA and DAERA, 2021).

The increased movement of biological materials around the world for trade is leading to introduction of new pests and diseases such as *Phytophthora spp*, whilst invasive species such as Japanese Knotweed are affecting rural land across NI, for example willow coppices used for biomass. The 2020 study by Cuthbert *et al*. has estimated that biological invasions cost the NI economy a minimum of £63.3 million, based on minimum estimates of £5.4 billion or the biological invasions costs to the UK's economy between 1976 and 2019.

In response to the threats posed by invasive alien species the DOE has published 'An Invasive Alien Species Strategy for Northern Ireland 2013'. The aim of the Strategy is to minimise the risk posed, and reduce the negative impacts caused by invasive alien species in NI. It also aims to increase awareness and understanding of the risks and issues involved in tackling invasive alien species as a central overarching issue.

NI comprises a wide range of habitats such as woodland, bog and grasslands, which are important for biodiversity and ecosystem services. The UK Land Cover Map 2015 (Rowland, et. al., 2017) reveals the proportion of land cover in each of ten aggregate habitat classes for NI as follows:

- 3.3% broadleaved woodland (6.1% UK average);
- 5.2% coniferous woodland (6.4% UK average);
- 6.8% arable (23.1% UK average);
- 57.3% improved grassland (30.4% UK average);
- 5.8% semi-natural grassland (9.6% UK average);
- 13.0% mountain, heath and bog (14.9% UK average);
- 0.1% saltwater (0.1% UK average);
- 4.2% freshwater (1.3% UK average);
- 0.4% coastal (3.5% UK average); and
- 4.1% built-up and gardens (7.2% UK average).

Upland blanket bogs and lowland raised bogs are well represented in NI. Peaty soils cover almost 15% of NI's land (DOE, 2015). A new peat map was developed by the Centre for Ecology and Hydrology (CEH) in 2017. The CEH mapping identified a total peat extent of 242,622 ha. Approximately only 1% of NI's peatlands have been restored in the past 30 years (Northern Ireland Assembly, 2021). There is currently no national peatland strategy for NI, however the DAERA Minister, Edwin Poots, has stated that a NI peatland strategy is being developed (CEH, 2017). However, 90% of lowland raised bogs have been lost or altered due to peat extraction, forestry and drainage in recent decades. Cooper, et al., 2009).

Many upland blanket bogs and lowland raised bogs are designated ASSI or given other protected status. Although most blanket bog has been physically modified, the majority is still capable of forming peat. NI has a large proportion of the UK and EU blanket peat resource. Throughout NI the RSPB, the National Trust and Ulster Wildlife have delivered conservation projects including restoration of peatlands and management of 727 ha nature reserves for biodiversity benefit, with 1,600 recorded species including 130 NI priority species (DAERA, 2021).

The dominance of farmland within the NI landscape means its biodiversity is particularly vulnerable to change through agricultural management. Over recent decades there has been a large-scale move away from mixed farming to a predominantly pastoral system, leading to the loss of semi-natural habitats, overwintering stubbles and hedgerows. More than 40% of NI's land area now comprises improved grassland (National Biodiversity Network, 2019).

In 2010 under previous Rural Development Programmes up to 45% of NI's farmland was being managed under agri-environment scheme agreements, having decreased to approximately 29% by 2015. During 2016, the area of agricultural land managed through these schemes fell by 85% to 46,000 ha (approximately 4-5% of NI farmland). This was due to the expiration in 2016 of those remaining 10 year agreements from the older agri-environment schemes (Countryside Management Scheme (CMS) and Environmentally Sensitive Areas Scheme (ESAS)) (NIEA and DAERA, 2019).

Presently, the woodland register and base-map estimates the forest cover in NI at 8.7% (DEARA, 2021), the lowest forest cover of any of the UK regions. In 2020/21, approximately 283 ha of new woodland (65 ha conifer and 218 ha broadleaf) was established by private landowners and part funded by the European Commission under the Forestry Grant Schemes (DAERA, 2021). The Woodland Trust has further restored 310 ha of ancient woodland with a further 960 ha surveyed. The ambition is to plant 9000 ha of new woodland by 2030. NI's Forestry Strategy aims to achieve 12% forest cover by 2050 and to ensure that both public and privately owned forests are managed in a sustainable way (NIEA, 2013). Woodland habitats and species are more vulnerable to climate change because of the highly fragmented nature of many semi-natural woodlands. NI has the highest density of hedgerows in the UK (though they are generally newer, having been planted within the last 200 years) (UK NEA, 2011).

Air pollution emissions from agricultural activities (in particular, ammonia from manure handling/storage and spreading) represent a significant pressure on sensitive habitats/ASSIs/SACs in NI due to eutrophication effects. Nitrogen deposition (mainly a result of ammonia emissions from agriculture) is a significant issue for sensitive habitats in NI as background levels are already higher than the critical loads for some habitats. NI is responsible for 12% of UK ammonia emissions, despite only having 3% of UK population and 6% of the land area (DAERA, 2020). Ammonia is seen as a threat for approximately 75% of NI's terrestrial priority habitats and as a threat of high significance for 45% of these habitats. Approximately 91% of ammonia emissions come from agricultural sources (Expert Working Group on Sustainable Agricultural Land Management for N. Ireland, 2017).

As revealed in the UK National Ecosystem Assessment (UK NEA) (2011), NI is notable within the UK for its large area of freshwater habitats, their flow dynamics, their nutrient

characteristics and their biodiversity, including internationally important bird populations. Open waters and wetlands cover approximately 7% of NI; there are three large lakes of particular importance for recreation and tourism, but they have become increasingly eutrophic. Lowland raised bogs and other wetland habitats have decreased over the past 10 years. Arterial drainage works carried out until the 1990s resulted in NI having the highest percentage of modified rivers in the UK, with accompanying impacts on biodiversity. The spread of invasive species has also become a concern in many wetlands, affecting the biodiversity of these habitats. More recently, priority has been given to restoring riverine habitats and recognising their role in flood prevention.

A summary for NI states that with 650 km of coastline, the intertidal loughs, estuaries and marine area are a significant component of NI's biodiversity (NBN, 2019). The NBN State of Nature 2019 report states that management plans for the NI Marine protected areas (MPA) network are being developed through the EU funded Marine Protected Area Management and Monitoring (MarPAMM) project to bring these sites into favourable condition, as only 4.48% of MPAs in NI are currently considered to be under favourable management.

3.3 Population: Socio-economics

The population of NI was estimated as 1,895,500 in June 2020, an increase of 0.1% between mid-2019 and mid-2020 (NISRA, 2021). Just over half of the population in 2020 (50.7%) were female, compared to 49.3% that were male. The annual population growth has remained positive over the last twenty five years, as over the decade the population of NI increased by a total of 90,700 people with an average increase of 0.5% per year. The two million milestone is expected to be reached by 2040 (NISRA, 2018, NIEA and DAERA, 2018). Between the 2001 and 2011 census data, the largest population growth was within settlements of less than 1,000 people and the open countryside. In 2019, 36% of the population live in rural areas, 5% in mixed urban/rural areas and 60% in urban areas, consistent with the 2016 results (NISRA, 2021).

Rural areas, which make up the majority of NI, exhibit a strong sense of community and local identity with a strong and well developed community infrastructure. The rural economy is based primarily on the small and medium-sized enterprises (SME) sector with a variety of strong indigenous businesses. Access to local rural transport services can be limited in terms of routes and frequency; rural transport provision is often uncoordinated.

According to the NI Poverty Bulletin 2019/20, in NI there were 313,000 people in relative poverty and 241,000 in absolute poverty, which equates to 17% and 13% of the population respectively. This demonstrates a slight improvement since the 2016/2017 results, as 18% of the population were living in relative poverty and 15% in absolute poverty. The proportion of working age adults in relative poverty as of 2019/20 was 14%, equivalent to 162,000 people. Absolute poverty for working age adults was 11%, equivalent to 126,000 people (NISRA, 2021).

NI remains one of the most deprived regions of the UK as a combined result of having a young population, low labour market participation rates, a high rate of economic inactivity, a larger share of employment in sectors of low productivity and below average wages. The Northern Ireland Multiple Deprivation Measure (NIMDM) (NISRA, 2017) is made up

from 38 indicators mostly relating to the period 2011-2016. The indicators are grouped into seven types or 'domains' of deprivation weighted as follows:

- Income Deprivation 25%;
- Employment Deprivation 25%;
- Health Deprivation and Disability 15%;
- Education, Skills and Training Deprivation 15%;
- Access to Services 10%;
- Living Environment 5%; and
- Crime and Disorder 5%.

Deprivation in NI varies geographically with a tendency for more deprived areas to the west, north and south and in Belfast. Areas around Belfast appear to experience lower levels of deprivation. The NIMDM is particularly revealing in that it shows the vast majority of the country (outside of urban areas such as Belfast) being extremely deprived in terms of access to services. Ninety-five of the 100 most deprived Super Output Areas (SOAs) are classified as rural.

The employment rate in NI over the period November-January 2022 was at 70.4%, lower than the UK average of 75.5%. However, this is an increase since 2013, when the employment rate was at 66.6%. The service sectors are the main source of employment. A particular historic challenge facing the NI labour market is its high level of working age population classed as economically inactive. Over the past 10 years, the inactivity rate has varied between just under 26% and 32% and for November-January 2022 was estimated at 27.5%. NI continues to have the highest inactivity rate of all UK regions and is above the UK average of 21.2% (Office for National Statistics, 2022).

The long-term unemployment rate has an increased share of persons in long-term unemployment (42.5%) in comparison with the unemployment rate in September-November 2020 (31.4%) (NISRA, 2022).

The current claimant count (Jobseeker's Allowance Claimants and those claimants of Universal Credit who were claiming for the reason of being unemployed) is approximately 41,200 in January 2022 (4.2% of the workforce), which is a decrease of 2.2% from previous month's figure. The January claimant count is 35% less than the peak in May 2021, and 35% higher than the pre-pandemic count in March 2020 (NISRA, 2022). The lowest claimant count rates in 2020 were in Lisburn and Castlereagh (3.5%) and Fermanagh and Omagh (3.8%) (NISRA, 2021).

Education attainments in NI are rising, however the average skill level of adults in NI is below that of many other Organisation for Economic Co-operation and Development (OECD) countries. The number of people of working age with high level skills (degree level and) increased from 30.2% in 2007 to 38.4% in 2017. This remains below the 42.7% average of the UK as a whole, indicating more can be done to improve the uptake of tertiary qualifications. In 2019, the figure of people of working age which still had no formal level of education has fallen to 13.3%, in comparison to 16.6% in 2017. This is twice that of the UK average and the highest of all UK regions (OECD, 2020). The number of school leavers with no qualifications has increased from 0.3% in 2016/17 to 0.6% in 2019/20, which is less than 3.6% in 2006/07. The number of school leavers gaining at least five GCSEs at grades A* - C or equivalent including English and Mathematics has increased

to 91.3% in 2019/2020, from 81.1% in 2014-2015 (NIEA and Department of Education, 2021).

According to the NISRA 2018/19 household survey results, 47% of the NI population is Protestant compared with 42% who are Catholic. Approximately 12% of participants responded with either other, no religion or did not answer (NISRA, 2020). Some districts are predominantly Catholic, such as Newry, Mourne and Down (71%); Derry and Strabane (72%); Fermanagh and Omagh (57%); and Mid Ulster (62%). Districts such North Down and Ards (65%), Mid and East Antrim (72%) and Lisburn and Castlereagh (52%) are predominantly Protestant (TEO, 2018). Segregation by religion or belief remains a feature of parts of NI.

Housing completions and the land available for housing in settlements across NI are monitored with regard to the provisions of prevailing development plans. The number of housing completions decreased by 53% between 2009/10 and 2010/11 (NIEA, 2013), but has seen an overall upward trend. In 2020/21, the number of housing completions was 6,446, a decrease of 12% from the previous year (7,314) (NIEA and Department for Communities, 2021).

3.4 Population: Health and Quality of Life

The health of a population can have significant impacts upon the ability of that population to develop socially and economically. The health of different populations varies in response to policy decisions and lifestyles.

In keeping with the rest of the UK, NI enjoys a ‘free at the point of access’ health service through the NHS although these services are increasingly under pressure due to a combination of the increased demand presented by an ageing population and a comparative reduction in funding relative to historic levels. Between 2011 and 2020 the health and social care workforce grew by 17% (Information Analysis Directorate, Department of Health, 2020). However, between 2016/17 and 2020/21 the average number of available hospital beds decreased by 4% from 5,910 to 5,673 (Information Analysis Directorate, Department of Health, 2021).

In 2020, the total number of deaths in NI from all causes was 17,614, an increase of 11.8% on the 2019 figure of 15,758. The life expectancy for females is estimated at 82.4 years which is almost four years higher than for males (78.7 years), down from over 6 years 3 decades earlier. In 2020, there were 20,815 births registered to NI, 1,632 fewer than in 2019 (NISRA and Department of Finance, 2021).

Obesity continues to be one of the most important public health challenges facing NI. In 2019/2020, 65% of adults were either overweight (38%) or obese (27%), up from 62% in 2018/2019. The proportion of children (aged 2 - 15) classed as overweight or obese has remained roughly the same at roughly 25% overweight or obese (Information Analysis Directorate, Department of Health, 2020). Epidemiological research has indicated that being obese can increase the risk of a range of health conditions from heart disease to depression, and can reduce life expectancy by up to nine years. The rise in obesity in NI since the outbreak of the COVID-19 can likely be attributed to a combination of factors. Since the outbreak of the pandemic, 23% of respondents reported eating less healthily,

while 31% reported doing less physical activity (Information Analysis Directorate, Department of Health, 2021).

In 2020/21, COVID-19 social restrictions was the most important factor contributing to feelings of stress in day-to-day life for 17% of respondents. Coronavirus social restrictions were the most important source of stress for 32% of those aged 65-74 and 25% of those aged 75+. Almost a fifth (18%) of respondents reported that they were very worried about the effect that Coronavirus was having on their life, while 57% were somewhat worried. Those in the most deprived areas (27%) were more likely to report being very worried about the effect that Coronavirus was having on their life than those living in all other areas (15-19%) (Information Analysis Directorate, Department of Health, 2021).

3.5 Soil and Land Use

Land is a limited resource with competition for use for agriculture, housing, forestry and other uses. The value and use of the land will generally depend on its quality, as well as its location. This section examines soil quality, the role of agri-environment schemes, forest and woodland plantings, and development on greenfield and brownfield land.

The NI government, Crown Estate and charities own considerable areas of land, much of it managed for conservation or public purposes. Most land, however, is owned by private landowners, primarily farmers. In the past, land management has been strongly influenced by EU policies such as the Common Agricultural Policy, however, in 2022, due to the withdrawal of the UK from the EU, DAERA announced the Future Agricultural Policy Decisions for NI.

NI has significant natural resources such as carbon rich soils (including substantial peatland) and high quality agricultural grassland. Furthermore, there is good availability of land bank for biomass feedstock for potential use in renewable energy technologies.

Soil is important in NI for the role it plays both in supporting agriculture and in forming important natural habitats. Degradation of the soil resource threatens both these interests. Soil quality in NI has slightly declined in recent years. In 2016/17, there were slightly more soils that were either under or over-enriched with phosphorus compared to 2010/11. It is expected that soil phosphorus concentrations will decline in the long-term as a result of the Nitrates Action Programme (NAP) and Phosphorus (P) Regulations (NIEA and DAERA, 2019).

Agricultural land quality is typically classified through a six grade system; the top three grades, Grade 1, 2 and 3a, are referred to as the 'best and most versatile' land. The Agri-Food and Biosciences Institute (AFBI) revealed NI in 2007 to be made up of 0% Grade 1, 7.1% Grade 2, 23.9% Grade 3a, 26.1% Grade 3b, 30.6% Grade 4, and 7.8% Grade 5 (which includes urban land) (AFBI and BGS, 2007). Currently less than 10% of NI farmland has an up-to-date soil analysis, whilst 64% of soils are not at optimum pH. This can partially be attributed to almost 30% of agricultural land being let in ‘Conacre’, a short-term arrangement which denies tenants security in their land tenure and obstructs long-term planning (Expert Working Group, 2017).

NI gives a total peat extent of 242,622 ha (CEH, 2021). It is an important environmental resource in terms of distinctive upland and lowland landscapes, conserving biodiversity, and affecting river catchment hydrology. While semi-natural peatlands only covers 12%

of the land area of NI, they account for 53% of the soil carbon pool. Peaty soils cover approximately 18% of NI's land area (DAERA, 2021).

There is limited information on the current status of peatland in NI, however, particularly with regards to soil structure, pH and nutrient profiles. In 2021 DAERA published the 'Northern Ireland Peatland Strategy 2021-2040' consultation document, which identifies the ecosystem services provided by healthy peatlands, including climate regulation and adaptation, details the current factors affecting our semi-natural peatlands and sets out the objectives to support sustainable peatland management. Recent condition assessment for peatland SACs and ASSIs has demonstrated that a high proportion of the designated sites is generally 'unfavourable' or 'unfavourable-recovering' condition (DAERA, 2021). The majority of peatlands in NI are in private ownership and their conservation is dependent on the adoption of good management practices by their owners.

Upland blanket bogs and lowland raised bogs are well represented in NI, however a loss of 8% of vegetation in lowland raised bogs, 25% in upland bog and 18% in fens was recorded between 1992 and 1998 due to overgrazing, drainage and peat cutting. Further loss of lowland bog by 10% and upland bog by 1% was recorded between 1998 and 2007 (UK NEA, 2011). Nutrient enrichment is also evident and the quality of habitats has been affected. Many are designated ASSI or given other protected status.

At the end of 2015, 305,000 ha of land in NI were under agri-environment scheme agreement, managed through the Northern Ireland Countryside Management Scheme (NICMS), the Countryside Management Scheme (CMS), the Environmentally Sensitive Areas Scheme (ESAS) and the Organic Farming Scheme (OFS). This represents approximately 29% of the total farmed land. The area of land managed through these schemes dropped in 2020 by 84.3% to 48,000 ha due to the expiration of a number of the agreements under the older schemes (CMS and ESAS). In 2020 agreements were solely under the Environmental Farming Scheme (EFS) (NIEA and DAERA, 2021).

The new EFS opened in 2017 and had a target of up to 6,200 EFS agreements in place by 2020. The first 1,155 Wider Level agreements commenced on 1 July 2017 and from 1 January 2018 a total of 233 EFS Higher Level agreements commenced (NIEA and DAERA, 2018). The initial target of 6,200 was not reached, as by the end of 2020 there are three tranches of the scheme with 4,700 agreements covering 47,700 ha of land. There are 3,891 wider agreements covering 4,683 ha and 774 EFS Higher Level agreements covering 43,035 ha (NIEA and DAERA, 2021)

Agri-Food is one of NI's largest and most successful industries, with exports in particular increasing. The gross output of NI's agriculture was estimated at £2.23 billion for 2020, a 4.2% increase from 2016. There were increases in the output of the milk, cattle, sheep, pigs, and eggs sectors, which were partially offset by decreases in output from the poultry, crops and horticultural sectors (DAERA, 2021).

Forests and woodlands provide important habitats, natural resources and diversity to landscapes. NI has the lowest level of tree cover (8.7%) of any UK regional territory (DEARA, 2021). Approximately 55% of NI's woodlands and semi-natural forests are owned and managed by the Forest Service; the remainder is managed mostly by private landowners (NIEA (2013). Much of the woodland lacks active management, is fragmented and not easily accessible by the public due to distance from residential areas.

In 2020/21, there were 283 ha of new plantings, which were part funded by the by the European Commission under the 2014-2020 Rural Development Programme. This represents a 34.7% increase on the 210 ha planted in 2017/18 and a large increase on the 54 ha planted in 2015/16 (NIEA and DAERA, 2021).

NI is, for its size, one of the most geologically diverse regions in the world (DOE, 2015). Geological sites have historical, educational, recreational and landscape value. Notable sites in NI include caves at Marble Arch, white cliffs at Antrim, Giant's Causeway, Slieve Gullion and the mountains of Mourne. Rocks and landforms have a major influence in determining the biodiversity of regions and more directly the physical character of the landscape. Potential threats to geological sites include landfill, coastal defence work and changes to natural systems (including human-induced changes).

NI, like other parts of the UK, has a legacy of land affected by contamination, often arising from its past industrial use (e.g. shipbuilding, textiles, petrol stations, etc.) but also from natural or diffuse sources. It is not known how much land is contaminated, although DOE records estimate that there are over 12,000 sites across NI that have had some form of previous industrial use (DAERA, 2022).

3.6 Water

Water, including rivers, lakes, loughs, estuaries, seas and groundwater is an essential natural resource and plays a vital role in maintaining biodiversity, human health and wellbeing, as well as economic development. This section reports on the quality of inland waters in NI, as well as the state of the marine, coastal and transitional waters.

River monitoring in NI is carried out routinely by NIEA against Water Framework Directive (WFD) standards. Overall classification utilises a combination of biological, chemical and hydromorphological quality elements including macroinvertebrates, pH (measure of acidity or alkalinity of a solution) and ammonia to assign status of river quality in one of five classes; high, good, moderate, poor or bad.

The default objective for all waters under the WFD should be good status by 2015; however, this depends upon the starting point:

- Where a waterbody is at moderate status in 2008 the objective for 2015 is good status.
- Where a waterbody is at poor status in 2008 the objective for 2015 is moderate status and the objective for 2021 is good status.
- Where a water body is at bad status in 2008, the objective for 2015 is moderate status, the objective for 2021 is moderate or good status and the objective for 2027 is good status.

In 2018, 31% of river waterbodies being classified as 'good' or 'high' quality. In 2021, no river waterbodies achieved 'good' or 'high' overall status, when the presence of uPBT substances were included as part of the chemical assessment. Of the three main river basins in NI – Neagh Bann, North West and North East – water quality is noticeably better in the North West. This can be seen in the Table below (rounded 2021 data).

Table 3.1: Overall river waterbody status in NI (Source: NIEA and DAERA, 2021)

River Basin District	High	Good	Moderate	Poor	Bad	No Data
North West	0	0	90	9	1	0
Neagh Bann	0	0	92	7	1	0
North East	0	0	85	13	1	0
Overall Status for NI	0	0	90	9	1	0

DAERA 2021 analysis shows that there has been a deterioration trend in the water quality of NI's waterbodies since previous surveys, as winter Dissolved Inorganic Nitrogen (DIN) has increased from 26.45 µM in 2015 to 35.71 µM in 2019, before decreasing to levels of 26.2 µM in 2020. This is considered to be no change since 2015.

Under the Nitrates Directive, NIEA must monitor surface waters for nitrate pollution against a mandatory standard of 50 mg NO_3/l (Nitrogen per litre). In addition a guide standard for surface waters is operational where 90% of samples should be less than 25 mg NO_3/l. In the 2012 to 2016 period, all rivers monitored for nitrate had an annual mean concentration of less than 25 mg NO3/l. In 2019, 99.8% of all sites had an annual mean concentration of less than 25 mg NO3/l (NIEA and DAERA, 2021). A map showing the water quality of surface water bodies across NI can be seen in Appendix B.

Lakes are a significant source of drinking water supplies. Lough Neagh and Upper and Lower Lough Erne make up over 90% of the total area of lakes greater than 50 ha in NI. In 2015 and 2018, 5 of the 21 lake waterbodies monitored in NI were classified as having a 'good' status and 42 lake waterbodies were classified as having less than 'good' status. In 2021, no water bodies achieved good overall status (NIEA and DAERA, 2021). The WFD Classifications are required to report to Europe on a 6-yearly basis. The last and most recent update has been produced in 2021. In 2018, new priority substances were introduced to the monitoring programme, which is a significant change in monitoring and classification for rivers, lakes, and other water bodies. For the first time the presence of ubiquitous, persistent, bioaccumulative, toxic (uPBT) substances, so-called 'forever' chemicals, have been assessed as part of chemical status. Consequently, uPBT substances have been detected at all monitored stations and resulted in failures of all of those stations.

The Groundwater Daughter Directive sets the groundwater quality standard for nitrate at 50 mg NO_3/l. In 2019, nitrate concentrations were monitored at 56 groundwater sites across NI giving an average concentration of 6.59 mg NO_3/l, up from 4.1 mg NO_3/l in 2016. Concentration of groundwater nitrate across NI are generally low with 54 of 56 (96%) stations below 25mg/l NO_3/l in 2019 (i.e., less than half of the permitted maximum level) (NIEA and DAERA, 2021).

Bathing water quality is measured against mandatory and guideline standards. Based on 2015-2018 data, 15 (58%) of the 26 beaches monitored in NI met the 'excellent' standard, 7 (27%) met the 'good' standard. Four beaches (15%) were classified as 'sufficient' and no beaches were classified as 'poor'. The number of beaches classified as 'excellent' has increased to 15 in the 2015-18 period, compared to 12 in the 2014-17 period. In 2018, nine beaches and two marinas were awarded Blue Flag status, meeting a number of criteria such as water quality, safety, facilities and information. Overall status of marine

waterbodies is also measured, and this accounts for both the ecological and chemical status of each waterbody. There were 25 marine waterbodies included in the reporting regime. In 2018, 10 marine waterbodies were classified as 'high' or 'good' status, whilst the remaining 15 were at 'moderate', 'poor' or 'bad' status. Monitoring of shellfish waters also occurs, 2 out of 9 designated Shellfish Waters Protected Areas (SWPAs) complied with the E. coli standard in 2018 (NIEA and DAERA, 2019).

NI has 650 km of coastline and many of the larger towns are associated with ports. The majority of the coastline is protected for its special interest. A number of the coastal species and habitats are recognised as internationally important. The coastline is also vital as a defence against storms, floods and erosion. The marine area is a key asset in terms of biodiversity, recreation, tourism, transport, aquaculture and fishing (UK NEA, 2011).

Effluent discharges to the water environment can affect its quality and come from many different sources such as commercial and industrial premises, wastewater and water treatment works and private dwellings. These discharges are controlled by the DAERA through the granting of consents and permits under the Water (Northern Ireland) Order 1999 and the Pollution Prevention and Control Regulations (Northern Ireland) 2003. The compliance rate for private sewage was 72% in 2019, which shows a decrease in compliance since 2010 which recorded a high of 88%. The compliance rate for trade effluent has decreased from 98% in 2018 to 93% in 2019. Compliance of Waste Water Treatment Works against the numeric conditions of their Water Order consent is a key performance indicator for the water utility sector and has continued to improve since 2007 having reached 99% in 2019. Drinking water quality remains at the highest level of compliance since 2004, at 99.86% of public drinking water and 98.85% of private water supplies (NIEA and DAERA, 2020). Due to COVID-19 Pandemic restrictions, the compliance sampling programme was significantly reduced for 2020, with less than 40% of the 2019 number of sample stations being scheduled. In the absence of formal compliance testing during the pandemic, surveillance and visual inspections have been used to help monitor sites and to respond to any reports of pollution (NIEA and DAERA, 2021).

Water pollution incidents are investigated by NIEA. In 2019, 1,754 incidents were reported to NIEA or discovered during inspections, of which 53.6% were substantiated as having an impact on the water quality of the receiving waterway. The number of incidents decreased by 2% and the number of substantiated incidents increased by 1.8% compared to 2018. The total number of substantiated incidents in 2019 was 39% lower than the average annual level recorded in the period 2001 – 2003. Of these, 17% were considered to be of 'high' or 'medium' severity, a 41% increase on 2018 figures. Farming was identified to account for the largest proportion of substantiated incidents investigated (36.5%) (NIEA and DAERA, 2021). There is an interrelated impact between water quality and ecology, particularly where pollution incidents cause eutrophication, which then impacts on aquatic and riparian habitats and species.

In terms of water resources, the UK Climate Change Risk Assessment has predicted that there will be a decrease in the volume of water available for public supply in NI over the medium term. From the resent day baseline of 758 Ml/day, public water supplies are expected to decrease around 10% by the 2050s. However, NI has decreased demand by 15% through control of leakages and revised projections suggest that control of

demand can help offset the effects of climate change. While the original assessment projected a number of Water Resource Zones (WRZs) to be deficit by 2013 and all by 2018, with the new demand data, no WRZs were projected to be deficit in the 2030s, nor in the same scenario in the 2080s (ASC, 2016).

Key legislation around water in NI that will need to be taken into account is:

- Waterways (Environmental Impact Assessment) Regulations (Northern Ireland) 2019 SR209;
- Water Environment (Floods Directive)(Amendment) Regulations (Northern Ireland) 2018;
- Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017 (SR 81/2017);
- Water Abstraction and Impoundment (Licensing) Regulations (Northern Ireland) 2006 (SR 2006/482) as amended;
- Groundwater (Amendment) Regulations (Northern Ireland) 2016;
- Groundwater (Amendment) Regulations (Northern Ireland) 2011:
- Groundwater (Amendment) Regulations (Northern Ireland) 2014;
- Groundwater Regulations (Northern Ireland) (SR 2009/254) as amended; and
- The Water (Northern Ireland) Order 1999 (SI 1999/662) as amended.

3.7 Air Quality

There are 19 Air Quality Management Areas (AQMAs) in NI, with all but 2 of the 11 district councils having declared at least one. The AQMA designations are in all cases for nitrogen dioxide (NO_2) and particulate matter less than 10 microns in diameter (PM_{10}), with road traffic the main pollution source in the majority (DAERA, 2020). Access to public transport services in rural areas is poor, leading to a high dependency on cars. This is consistent with the trend seen in the rest of the UK and Western Europe.

There were 21 automatic air quality monitoring stations operating in 2020 in NI (DAERA, 2020). EU limit values, target values and corresponding Air Quality Standard (AQS) objectives, have been met by the due dates for the following pollutants: particulate matter as PM_{10} and $PM_{2.5}$, Nitrogen Dioxide (NO_2), Ozone, Carbon monoxide (CO), benzene, sulphur dioxide (SO_2) and metallic pollutants (lead, arsenic, cadmium and nickel).

In 2020, levels of NO_2 at ten sites did not breach the UK Air Quality Strategy annual mean limit value of 40 µg/m^3, reaching the mean of 24.3 µg/m^3. This demonstrates a positive change from 35.6 µg/m^3 reported in 2014. Roadside NO_2 levels have decreased from 40.6 µg/m^3 in 2012 to 21.8 µg/m^3 in 2020. NO_2 is also monitored against a baseline year value in 2014 as an indicator for the draft Programme for Government (PfG) framework. Compared to a baseline year of 2014, the NO_2 concentration have demonstrated a decrease (NIEA and DAERA, 2021). Annual mean NO_2 concentrations in 2020 were lower than in previous years, in part due to the Coronavirus pandemic. The 'Effects of COVID-19 Restrictions on Air Quality in Northern Ireland' summary report found a large reduction in concentrations of NOx and NO_2, associated with the lockdown measures and believed to be partly caused by the reductions in road traffic (Ricardo, 2021). Not since 2002, when there were only four monitoring sites, has there been a year when no sites exceeded the annual mean NO_2 limit value within NI (DAERA, 2020).

In 2020, the annual mean concentration of particle matter (PM_{10}) did not breach Air Quality Strategy annual mean limit value of 40 µg/m^3 either. The annual mean concentration of PM_{10} across urban areas was 15 µg/m^3 and the mean for the Lough Navar rural background monitoring site was 7 µg/m^3 (NIEA and DAERA, 2021).

Although no sites exceeded the AQS objective or the EU target value in 2020 for Ozone (O_3), the possibility remains for the future. Ozone levels remain variable from year to year as ozone concentrations are affected by long-range, metrological and local factors. The last time any site in NI exceeded the AQA objective for ozone was in 2018, in Belfast Centre and Lough Navar (DAERA, 2020).

Benzo[a]pyrene has been monitored at three different sites in NI. While all sites met the EU target value, two of the three sites where benzo[a]pyrene is monitored continue to exceed AQS objective (DAERA, 2020).

In 2019, of the ammonia emissions from agriculture, 88% came from livestock, 8% from the application of fertilisers containing nitrogen and 4% from the application of other organic materials to land (sewage sludge and digestate). Ammonia emissions from livestock increased by 6.9% since 2001 and ammonia emissions from the application of nitrogen fertilisers decreased by 18.9%. This can be associated with a reduction in fertiliser use, particularly on grassland. The situation in NI contrasts with the UK as a whole, which has seen a 13.7% decrease in emissions from livestock due to an increase rather than a decrease in livestock numbers. Overall ammonia emissions have increased in NI by approximately 8.5% from 2001 to 2019 (DAERA, 2021).

NI's air quality has seen a marked improvement in recent decades. Sulphur dioxide has decreased substantially due to the wider availability of natural gas, which has led to a reduction of coal and oil used for domestic heating. Concentrations of PM_{10} have generally remained level over the last few years but have slightly decreased in comparison to a peak in 2003 (NIEA, 2013). There is a lack of a downward trend in the most widely exceeded pollutant, NO_2, which has remained generally level since the late nineties. This has been attributed to the increase in proportion of diesel cars in the market and retrofitting of pollution control devices to vehicles, as well as an increase in hemispheric background concentrations of ozone.

3.8 Climate Change

In February 2020, the Northern Ireland Assembly declared a climate emergency and on 9 March 2022 the Assembly agreed Northern Ireland's Climate Change Bill 2022, which subsequently received Royal Assent on 6 June 2022. The Climate Change Act (Northern Ireland) 2022 legally requires the NI Civil Service to assist in the delivery of the target of net zero emissions by 2050. The Climate Change Act legally requires, in delivering, that all Northern Ireland Departments contribute to delivering its targets, carbon budgets and climate action plans. It also legally supports all departments' climate change related strategies and policies now and in the future. The NI Executive's Green Growth Strategy sets out how the Executive will deliver the Climate Change Act, meet its targets and grow the Northern Ireland economy in a sustainable way. The Climate Change Act and the Green Growth Strategy will significantly shape future Programmes for Government, policy development and investment decisions.

NI's current climate is characterised by relatively mild winters, cool summers and periods of more extreme weather. During the 21st Century NI is projected to experience increasing average temperatures throughout the year, an increase in average rainfall in winter, a decrease in average rainfall in summer and rising sea levels (UK Climate Projections 2009, UKCP09).

The 2020 mean annual temperature (10.24°C) was 0.08°C lower than the 10.32°C recorded in 2019 (NIEA and DEFRA, 2021). Mean annual maximum and minimum temperatures have been rising since the end of the 19th Century, by the end of the 20th century, the ten-year moving average temperature had risen to its highest levels since the temperature records began. The 2005 - 2014 decade was 0.7°C warmer than the 1961-1990 average. Such changes in temperature extremes have implications for agriculture and health. Rainfall is also important for agriculture. There is some evidence of an upward trend in mean annual rainfall, with less rain falling in summer months (ASC, 2016). The 1970s had lower levels of rainfall but there is no strong trend in recent years. Growing seasons fluctuate and since the 1980s, there has been a tendency for a longer growing season.

The first UK Climate Change Risk Assessment was published in 2012 and sets out the main risks and opportunities for the UK, arising from climate change, as well as outlines the UK Government's views on the main issues raised in the Climate Change Risk Assessment (CCRA). In consequence, the second UK Climate Change Risk Assessment was published in 2017 (ASC, 2016).

The third UK Climate Change Risk Assessment (CCRA3) was published in January 2022, and it assesses 61 risks and opportunities from climate change to NI. Action is needed now to address 31 of them, further investigation is needed for 19, sustaining current adaptation action is deemed appropriate for 5 of the risks or opportunities and 6 have been classified as watching brief. The assessment for NI identified that more action was needed in a number of areas including:

- Risks to terrestrial species and habitats from changing climatic conditions and extreme events, including temperature change, water scarcity, wildfire, flooding, wind, and altered hydrology (including water scarcity, flooding and saline intrusion).
- Risks to terrestrial and marine species and habitats from pests, pathogens and invasive species.
- Risks to soils from changing climatic conditions including seasonal aridity and wetness.
- Risks to natural carbon stores and sequestration from changing climatic conditions, including temperature change and water scarcity.
- Risks to and opportunities for agricultural and forestry productivity from extreme events and changing climatic conditions (including temperature change, water scarcity, wildfire, flooding, coastal erosion, wind and saline intrusion).
- Risks to agriculture and forestry from pests, pathogens and invasive species.

- Risks to freshwater species and habitats from changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and phenological shifts.
- Risks to marine species, habitats and fisheries from changing climatic conditions, including ocean acidification and higher water temperatures.
- Risks and opportunities to coastal species and habitats due to coastal flooding, erosion and climate factors.
- Risks to infrastructure networks (water, energy, transport, ICT) from cascading failures.
- Risks to infrastructure services from river, surface water and groundwater flooding.
- Risks to transport from high and low temperatures, high winds, lightning.
- Risks to health and wellbeing from high temperatures.
- Risks to people, communities and buildings from flooding.
- Risks to cultural heritage.
- Risks to business sites from flooding.
- Risks to business locations and infrastructure from coastal change from erosion, flooding and extreme weather events.
- Risks to UK food availability, safety, and quality from climate change overseas.
- Risks to the UK from international violent conflict resulting from climate change on the UK.
- Risks to international law and governance from climate change overseas that will impact the UK.
- Risks from climate change on international trade routes.
- Risk to UK public health from climate change overseas.
- Risk multiplication from the interactions and cascades of named risks across systems and geographies.

Despite climate change being a devolved issue in NI, how it is tackled is influenced by EU and UK policies and legislation. The Climate Change Act 2008 is UK legislation that extends to NI. It sets a long-term framework for the UK to reduce its greenhouse gas (GHG) emissions. The Act set a statutory target to reduce emissions of GHGs in the UK by 80% against the 1990 baseline by 2050 with a minimum 34% reduction in carbon dioxide emissions to be achieved by 2020.

Part 4 of the UK Climate Change Act 2008 sets out the duties of NI in relation to the impact of and adaptation to climate change. Despite there being no specific target or carbon budget for NI in the Act, it is implicit that NI contributes to the UK effort. The PfG sets a target of a reduction of 35% in greenhouse gas source emissions by 2025 from the base year. The most recent DAERA projections demonstrate that NI is not likely to achieve this level of emissions reductions through existing policies. Notably, there is a policy gap in transport and agriculture (Committee on Climate Change, 2019).

The first Northern Ireland Climate Change Adaptation Programme was published in 2014 and covers the period 2014-2019. The programme identified four primary areas for action including flooding, water, the natural environment and agriculture and forestry. The DAERA co-ordinated and prepared the 2nd Northern Ireland Climate Change Adaptation Programme, 2019-2024 (NICCAP2), it had been published in 2019. NICCAP2 primarily contains the Governments' response to the relevant NI risks and opportunities identified within the NI Evidence Report.

In May 2010 the NI Executive approved a proposal by the Minister for the Environment to establish what was then known as the Cross-Departmental Working Group on Greenhouse Gas Emissions. This group, chaired by the Minister and made up of senior officials of all Departments, was tasked with developing a Greenhouse Gas Emissions Reduction Action Plan. The plan was published in February 2011 and a commitment was given to provide the NI Executive at the Stormont Assembly with an annual report on progress towards the NI target of a reduction in GHG emissions of at least 35% by 2025 based on 1990 levels.

Table 3.2: Targets for reducing GHG emissions (Source: DAERA, 2019)

Region	Target on 1990 levels	2018 Performance
NI	-35% by 2025	-18%
UK	- 34% by 2020 - 80% by 2050	-44%

The latest advice from the CCC suggests an overall 82% reduction of all GHGs by 2050, with an interim of 48% by 2030 (CCC, 2019).

Currently the UK makes up approximately 1% of global emissions, and it is estimated that NI's share of global emissions is around 0.04%. Comparing the source of GHG emissions across the UK, NI has a much larger proportion of its total emissions from agriculture. NI accounted for 4.3% of total UK greenhouse gas emissions in 2018 and produced the equivalent of 10.3 tonnes of CO_2 per person compared with the average 6.8 tonnes in the UK. By sector agriculture provides the biggest contribution to emissions in NI with 27%, higher than the rest of the UK at 10% (Northern Ireland Assembly, 2021). This is because proportionally there is less industry and energy related emission sources in NI than elsewhere in the UK, and hence agriculture emissions are comparatively more important. Table 3.3 shows how GHG emissions vary between NI and the UK as a whole for the largest contributors.

Table 3.3: Comparison of GHG emissions source (2019) (Source: DAERA, 2019 and BEIS, 2021)

Sector	NI	UK
Agriculture	26%	10%
Energy Supply	13%	21%
Residential	14%	15%
Business	11%	17%
Transport	20%	27%

Land Use Change	12%	-
Other	2%	5%
Waste Management	3%	4%

Unlike for the rest of the UK, the land use, land-use change, and forestry sectors are a net carbon source rather than a net sink. Forest coverage in NI is approximately 40% below the UK as a whole. Future inclusion of emissions from degraded peatland in the UK emissions inventory could add around 9% to NI's total emissions (Northern Ireland Assembly, 2021).

Table 3.4 shows a time series of NI GHG emissions by sector for the period 1990 – 2019. NI's total GHG emissions have reduced by 18% since 1990. The largest contributors to GHG emissions in NI in 2019 were the agriculture, transport, residential and energy supply sectors (DAERA, 2019).

Table 3.4: 1990-2019 NI GHG Emission Inventory ($MtCO_2e$) (Source: DAERA, 2019)

Sector	1990	2018	2019	% change base year to 2019	% change 2018 to 2019
Agriculture	5.2	5.5	5.6	7.7	1.0
Business	3.0	2.4	2.3	-24.6	-5.9
Energy Supply	5.3	2.9	2.8	-47.5	-4.8
Industrial Process	0.8	0.2	0.2	-69.6	-1.7
Land Use Change	2.3	2.5	2.5	9.1	0.3
Public	0.5	0.1	0.1	-70.2	-2.5
Residential	3.7	2.8	2.9	-21.4	2.6
Transport	3.5	4.3	4.2	21.5	-3.1
Waste Management	1.8	0.7	0.7	-59.8	-2.1
Total	**26.1**	**21.7**	**21.4**	**-17.9**	**-1.4**

Emissions from the transport sector tend to be large as a result of increasing population and increasing demand for transportation despite improvements in energy efficiency of vehicles. Total GHG emissions from the transport sector in NI have increased by 21.5% between the base-year and 2019 despite improvements in efficiency of transport vehicles. This is as a result of strong growth in transport demand and increased affordability of cars. Due to the rural nature of NI, planning policies that have favoured single dwellings in the countryside, and poor accessibility and frequency of public transport, there is an over reliance on cars as the most common means of transport, with associated impacts on climate. Travel restrictions and other constraints as a result of the COVID-19 Pandemic, resulted in changes to the data collection methodology to telephone interviewing and a reduction in the number of response categories to consider. Therefore, 2020/21 data are not directly comparable to the data collected during previous years.

The decrease in GHG emissions in UK from 2018 was mainly caused by reductions in emissions in the energy supply sector, down 8.1%. This can be attributed to a decrease in power station emissions due a reduction in the use of coal. NI represents a higher than average share of UK domestic emissions considering its share of UK population. The reason for this is the comparatively limited availability of natural gas resulting in the high consumption of coal, burning oil and gas oil in the residential sector (Department for Business, Energy & Industrial Strategy, 2021). Total GHG emissions from the residential sector in NI accounted for 14% of NI's total GHG emissions in 2019, a decrease of 21.4% from the base year (DAERA, 2019).

Peatland acts as a large carbon store when managed to protect carbon content, whilst there is also a very high percentage of grassland cover available in NI to capture carbon. The current low levels of afforestation present a limited opportunity for carbon offsetting, however there is good potential for carbon storage considering the Department of Agriculture and Rural Development's (DARD) strategic aim to double the area of tree cover over the next 50 years in the context of sustainable forestry.

The climate, facilities and processing capabilities in NI are more favourable than other regions (for food production). There is a well-connected research development and extension programme in renewable energies, low carbon farming and high level stakeholder engagement.

Attitudes in NI towards climate change are changing, and public concern regarding environmental issues was high in 2020/21, with 82% of respondents expressing their concern about the environment (DAERA, 2021). The recent NISRA 2020/21 Continuous Household Survey asked households to give their views on important environmental issues. The most commonly selected environmental problems for households were illegal dumping of waste and litter (34%), climate change and ozone layer depletion (23%) and pollution of air, water and soil (14%). The survey asked respondents what actions they had taken that had a positive impact on the environment. The top three actions taken by households in 2020/21 were: reused, recycled and disposed of waste products appropriately (92%); reduced food waste (76%) and reduced consumption of household utilities (52%) (NIEA and DAERA, 2021).

In June 2019 the UK became the first major economy to commit to a 100% reduction in GHG emissions by 2050. The Department for the Economy published the Northern Ireland Energy Strategy - the Path to Net Zero Energy and its associated action plan on 16 December 2021 and in January 2022 respectively. The Energy Strategy sets a target, at this stage, to, "Meet at least 70% of electricity consumption from a diverse mix of renewable sources by 2030."

For the 12 month period January 2021 to December 2021, 41.3% of total electricity consumption in Northern Ireland was generated from renewable sources located in Northern Ireland. This represents a decrease of 7.9 percentage points on the previous 12 month period (January 2020 to December 2020).

The decrease over this period in the proportion of electricity consumption generated from renewable sources was driven by the reduced volume of wind generation due to lower wind speeds experienced during 2021.

The vast majority of renewable electricity generated within NI comes from wind sources, of all renewable electricity generated within NI over the 12 month period January 2021 to

December 2021, 82.1% was generated from wind, the lowest wind proportion on record. This compares to 84.9% for the previous 12 month period (January 2020 to December 2020). (NISRA and Department for the Economy, 2022).

3.9 Material Assets

NI has significant natural resources such as water, carbon rich soils and high quality grassland, whilst natural resources are also available for renewable energy generation e.g. wind, hydro, marine, biomass and solar. Approximately 90% of raw materials are sourced from local industry, and some farmers have implemented resource efficiency measures with evidence of greater profitability.

NI is underlain by extensive deposits of economically valuable minerals. There are nearly 600 occurrences of economic minerals and approximately 1800 abandoned mine workings, mostly dating from the last century. The bulk of mineral commodities, which are largely natural sand, gravel and crushed rock aggregate plus rock for cement manufacture, are obtained through quarrying (Minerals Unit, 2018). A regeneration plan for the closed Magheramorne Quarry in County Antrim, where limestone was extracted in the 19th and 20th centuries, is expected to transform the site into a major recreational and leisure attraction, including 450 sustainable homes.

A variety of industrial minerals are present in NI; 500,000 tonnes of salt is produced and processed in NI before being sold to the winter road maintenance markets in the UK, Ireland and the USA. Bauxite is present in County Antrim of a composition up to 62%. Perlite (volcanic glass) used in construction materials, filtration systems and agriculture is found near Sandy Braes, Co Antrim. Significant quantities of gypsum and anhydrite are found in the Lower Carboniferous of Co Fermanagh. In 2004 there were 137 active aggregate quarries and pits extracting 25.7 Million tonnes of material such as sand and gravel, basalt and sandstone. NI also has deposits of coal, peat and lignite; the latter has the greatest potential for future production and power generation estimated at over 1 billion tonnes (GSNI, 2008). However, it will be necessary to move away from fossil fuel production towards renewable energy generation in order to be compatible with climate change commitments. Platinum group metals (used in technology) have been identified in Counties Antrim, Tyrone and Fermanagh (GSNI, 2008).

The production and disposal of waste is becoming an increasingly important issue. Waste is produced by households, by industrial processes, by the construction and demolition industry, through commercial activities and agricultural practices and by public services and utilities. Waste can affect the environment through its visual impact or by emissions to the air, groundwater and surface water as well as the contamination of land.

In NI, the total amount of local authority collected (LAC) municipal waste arising has declined by around 14.1% between 2006/07 and 2012/13. Since then, there has been a trend of escalation of municipal waste, with a 12.9% increase between 2012/13 and 2020/21. In 2020/21, there has been a 3.2% increase on 2019/2020 figures. In 2020/21 the amount of waste produced per household was approximately 1,207 kg per year, an increase of 4% from the 2019/20 figure of 1,160 kg. In 2020/21 234,956 tonnes of municipal were landfilled, a landfill rate of 22.8%, the lowest ever recorded, a significant drop from a high of 72.3% in 2006/07. The quantity of waste sent to landfill has declined each year since 2004/05. Landfilled biodegradable waste emits methane and carbon

dioxide into the atmosphere as it decomposes, and leachate is produced when water becomes contaminated as it filters down through a landfill. NI's councils sent 53.8% of all biodegradable waste to landfill during 2020/21, 1.2% more than previous year (DAERA, 2021).

Waste is becoming an increasingly important issue in NI, as recycling of waste is becoming more widespread. The revised Northern Ireland Waste Management Strategy (DOE, 2013) proposed to achieve a 50% recycling rate by 2020 for local authority collected household waste. Since 2014/15 household waste recycling has increased by 9.8%, reaching 51.9% in 2019/20. The recycling rate for both household and non-household waste collected was 51.1% in 2019/20, a slight increase on the 49.8% recycling rate recorded in 2018/19. In 2019/20, the municipal waste collected by local authorities sent for reuse, dry recycling and composting reached a record high at 510,374 tonnes (NIEA and DAERA, 2021).

3.10 Cultural Heritage

The built heritage of NI includes archaeological sites and monuments, historic buildings, industrial and military remains, gardens, historic landscapes, shipwrecks and other underwater features. The built environment is of considerable importance in these areas. As well as listed buildings there are also a significant number of buildings of historical and archaeological importance that do not meet the listed building criteria and are classed as 'record only'.

The rural, largely undeveloped nature of NI has helped preserve its archaeological sites and built heritage better than in other countries. A map showing areas of significant archaeological interest across NI can be seen in Appendix B. NI's centralised heritage recording system has created a unified, standardised and advanced baseline data set, in particular for industrial heritage, post-medieval/modern defence heritage, listed buildings and non-listed buildings of historical interest.

NI has a rich cultural heritage of archaeological sites, as there are 51,783 heritage assets currently recorded in NI, 24% of which are protected by formal designation. NI has a total of 190 single, groups or complexes of sites and monuments in state care; representing some of the premier examples of monument types in NI, these are subject to an ongoing conservation programme (Department for Communities, 2020).

In 2019/20, there were a total of 2,008 scheduled monuments (a 33% increase since 2001/02), including settlements, defences, workplaces, routeways and sites for ritual and burial (NIEA and DAERA, 2021). Application numbers for scheduled monument consent increased throughout 2018/19 and reached 97 in 2019/20, the highest number presented since before 2004/05. An evident increase in government and local council projects is one of the main reasons for this increase. Scheduled sites are managed by their owners under NIEA's Built Heritage guidance. The condition of scheduled monuments is assessed regularly, and results of a random sample inspection survey of 1,500 sites from the Sites and Monuments Record were published in 2009 by NIEA in the Condition and Management Survey of the Archaeological Resource (CAMSAR) for NI.

Listed buildings are those of special architectural or historic interest, and provide an indication of the extent of this historical architectural resource. In 2003/04 there was a

total of 8,194 listed buildings, since then there has been a modest increase of 9.8% in the number of listed buildings with a total of 8,994 buildings recorded by the DAERA in 2018/19. However, it should be noted that a significant number of buildings have also been found that no longer meet the legislative test and have therefore been removed (NIEA and DAERA, 2021). Listed buildings are graded as A, B+, B, B1 or B2 depending on their level of special architectural or historic interest; approximately two-thirds of listed buildings are in the lower two categories.

A listed building or structure is at risk when its condition and management is deemed to be poor and unsustainable, placing the building or structure under threat of deterioration and/or demolition. Those that are classified as 'at risk' in NI are recorded on the online Built Heritage at Risk in Northern Ireland (BHARNI) database. In 2019/20, there were 620 listed buildings and structures on this database, an increase of 93 from the register in 2018/19, and 19 buildings had been removed in the same period. In the period between 2003/04 and 2019/20, 305 buildings and monuments were removed from the list due to achieving conserved status (NIEA and DAERA, 2021).

Whilst there is no statutory requirement for owners of listed buildings to maintain their properties in a good condition, owners can be prosecuted for deliberately damaging or destroying listed buildings. In addition, the owners of listed buildings in a state of disrepair can be issued with an urgent works notice which outlines the action which the DOE will take to carry out emergency works if the owner does not initiate these within seven days. In order to encourage building conservation activities, NIEA offers repair grant aid to owners of listed buildings. During 2019/20, £322,820 in funding was spent on 17 grants, which is 4.8% higher than the £308,166 spent in 2018/19 (NIEA and DAERA, 2021).

In terms of archaeology, the Sites and Monuments Record (NISMR) holds information on over 16,000 archaeological sites and historic monuments. These range from Mesolithic campsites, Bronze Age landscapes and Early Christian monasteries through to the defended houses of the Plantation settlers. Peatland (which covers 15% of the land area in NI) is valuable as an archival record of climatic and vegetation history and archaeological remains. There are also more than 16,000 features listed in the Industrial Heritage Record (MBR), including mills, mines, canals and railways (DfC, 2022).

The Northern Ireland Heritage Gardens Archive contains a comprehensive record of over 700 historic parks, gardens and demesnes (manorial estates). Around 154 sites have been selected on the main Register with a further 150 sites designated as supplementary sites (DfC, 2022). There are 60 Conservation Areas and 177 Areas of Townscape/Village Character identified throughout NI, along with 547 Local Landscape Policy Areas (DfC, 2020). Conservation Areas are places of special architectural or historic interest where it is desirable to preserve and enhance the character and appearance of such areas. It has been noted that cultural heritage assets may be at risk from coastal flooding and erosion related to a changing climate (Defra, DOE, Welsh Government and Scottish Government, 2012).

3.11 Landscape and Seascape

NI has attractive, largely unspoilt and high quality rural landscapes, numerous protected area designations and major rural tourism attractions. A map showing AONB's and national cycle routes across NI can be seen in Appendix B.

The Giant's Causeway and Causeway Coast site was inscribed as a World Heritage Site (WHS) by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 1986, contains superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance (DAERA, 2022). The Giant's Causeway, located on NI's Antrim coast and renowned for its polygonal columns of layered basalt resulting from a volcanic eruption 60 million years ago, is a UNESCO World Heritage Site (natural landscape designation). Major rural tourism attractions in NI include the Giant's Causeway, the Mourne Mountains and the Glens of Antrim, whilst the Antrim coast is considered to be of very high seascape value, particularly along the Causeway Coast. 'Northern Ireland Local Government District Tourism Statistics 2019' report states that in the period 2017-19, 20% of total overnight trips in NI was trips to The Causeway Coast and Glens) (NISRA and DoF, 2020).

There are nine areas designated as Areas of Outstanding Natural Beauty (AONB) in NI. These include the Antrim Coast and Glens; the Causeway Coast; Lagan Valley; the Mourne, Binevenagh; Ring of Gullion; Sperrin and Strangford and Lecale (DAERA, 2022). The protection of cultural values, the promotion of public enjoyment and the fostering of the social and economic well-being of local communities sit alongside nature conservation as aspirations at these sites.

While the AONB designation policy is one of protection and enhancement, with regards to planning applications in these areas, account has been taken of the needs of local communities and the need to sustain the economic and social wellbeing of those living in the AONBs. The SPPS 2015 states that "*Development proposals in AONBs must be sensitive to the distinctive special character of the area and the quality of their landscape, heritage and wildlife, and be in the accordance with relevant plan policies."*

There are no national parks in NI. In March 2011 the DOE published a White Paper as a first step towards bringing forward enabling legislation to allow for the creation of national parks. However, the Environment Minister's statement on 11 November 2013 'shelved' the National Parks Plan due to high levels of opposition from farmers and landowners (Northern Ireland Assembly, 2013). At present, there are plans to create a national park in the Mourne Mountains which is supposed to cover the area stretching from Slieve Croob to Newcastle and Carlingford Lough (UK National Parks, 2012).

A Landscape Character Assessment was carried out across NI in 2000 which describes the local character areas. Landscape character areas, of which there are 130 across NI (DAERA, 2022) are defined as areas with a distinct and recognisable pattern of elements that occur consistently in a particular type of landscape. It reflects on the particular combination of geology, landform soils, vegetation, land use and human settlement. The Northern Ireland Regional Landscape Character Assessment provides a strategic overview and divides the countryside into 26 Regional Landscape Character Areas based upon information on people and place and the combinations of nature, culture and perception which make each part of NI unique (NIEA, 2016).

The Northern Ireland Regional Seascape Character Assessment (NIEA, 2014) identified 24 distinct Regional Seascape Character Areas, each with a unique sense of place. The assessment noted that the seascapes are continually changing due to natural and cultural influences. General forces of change were identified as natural coastal processes, risk of flooding from sea level rise, effects of climate change, EU fisheries policy reform,

changes in water quality, increases in visitor numbers, pressure for development and changes in agricultural and land management.

Enclosed farmland is the most common broad habitat in NI, covering an estimated 44% of the total land area, with the majority consisting of improved grassland (DOE, 2015). Enclosed farmland gives the countryside its characteristic appearance. Since the 1950s many field boundaries have been removed, but this trend is declining (UK NEA, 2011).

Semi-natural grasslands have declined significantly over the last 60 years due to fragmentation and agricultural intensification. The Biodiversity Strategy (DOE, 2015) estimated semi-grasslands cover 18.5% of NI's land area, although the UK Land Cover Map 2015 puts the estimate at 5.8% with improved grassland covering 57.3% (Rowland, et al., 2017). Mountains, moorlands and heaths contain the largest tracts of semi-natural habitats and cover an estimated 13% of NI, however, forest cover is low compared to the rest of the UK and Europe, at just 8.5%. NI is notable within the UK for its large area of freshwater habitats; rivers, lakes and wetlands cover an estimated 4.2% of total land area. The UK NEA notes that urban areas cover approximately 7.5% of NI and increased by approximately 30% between 1998 and 2007, although the UK Land Cover Map 2015 estimates built up areas and gardens as 4.1% (UK NEA, 2011 and Rowland, et al., 2017).

Particular issues affecting the landscape in NI are agriculture and tourism. In keeping with much of the UK and Europe, agriculture in NI is changing, with subsidies shifting more towards landscape and nature conservation objectives rather than solely focusing on production.

Landscapes in NI have also been strongly affected by rural development, particularly single dwellings and their associated infrastructure, and windfarms / single turbines (e.g. in County Tyrone), as well as by agricultural intensification.

3.12 Natural Capital

This section looks at the inter-relationship between the preceding sustainability topics, as well as green infrastructure (GI) and ecosystem services (ES) which are cross-cutting topics of increasing importance. It also includes information on other cross-cutting themes such as tourism and environmental knowledge and understanding. The purpose of this section is to link environmental, social and economic issues in a more integrated way, and emphasise that a good quality environment is essential to continuing social and economic prosperity.

ES can be defined as the benefits that people obtain from ecosystems, or the environment. These include provisioning services such as food, water and raw materials; regulating services such as flood and disease control; cultural services such as health, spiritual, recreational, and cultural benefits; and supporting services, such as nutrient cycling, that maintain the conditions for life on Earth. ES make economic sense as they provide direct or strategic support of all human activities.

The UK NEA revealed values that have been placed on some of the ES that NI provides. Provisioning services include livestock, dairy and poultry products (which together accounted for £1.14 billion of output in 2008); arable products (£126 million); marine fisheries (£25 million); aquaculture (£11 million); forest products (£7 million); and drinking water (£186 million). Cultural services include tourism (£1.5 billion); and coarse, game

and sea/shore angling (£43.5 million). Valued regulating services include apple pollination (£7 million), whilst the supporting service of water quality was valued at £8 million. The report further revealed that a 2006 study estimated that the natural environment contributed £573 million to the NI economy (UK NEA, 2011).

The EC has described the Atlantic area as Europe's largest and most important ecosystem. The NI coast in particular (which borders the Atlantic Ocean to the north and the Irish Sea to the east) has highly productive and biologically diverse ecosystems. The majority of NI's 650 km of coastline is protected for its nature conservation interest, but more importantly it includes productive and biologically diverse ecosystems, with features that serve as critical natural defences against storms, floods and erosion (NBN, 2019). Sea level rise will thus be a significant concern for coastal planning as coastal defences and managed retreat will need to be considered.

NI's other habitats, particularly grassland and peatland are excellent carbon stores if managed appropriately, whilst the extensive hedgerow networks across NI provide connectivity through the landscape and minimise soil erosion (UK NEA, 2011). Biodiversity also plays a role in providing ecological networks and steppingstone habitats. This connectivity is important and can be affected both positively and negatively through rural development.

Public access to land in NI is more restricted than other parts of the United Kingdom. Land ownership in NI is significantly different as most farms are of a much smaller scale, with a proportionately higher number of the population with land owning interests. A survey conducted in 2020 identified that the benefits of spending time outdoors during the COVID-19 lockdown were positive and significant. Approximately 84% of participants reported feeling physical health benefits and 90% reported benefits related to mental health and wellbeing. Benefits were strongest amongst people who visited the outdoors most often during lockdown and people with quality trails and greenspaces close to home. Approximately 51% of respondents expected to spend more of their free time outdoors than they did pre-lockdown (DEARA, 2021).

The survey found that people would most like to be able to visits local parks, the countryside and coast, to walk on off-road trails and to spend time with family and friends. There was significant support for the development and improvements of walking and cycling trails (DEARA, 2021).

There is a disparity to public access to woodland in NI, with most being located far from where people live. For example, whilst 72% of NI's woodland is publicly accessible, only 7.2% of the population has access to a 2 ha+ woodland site within 500 m of their home (rising to 40% for a 20 ha+ site within 4 km of home) (UK NEA, 2011). The social use of both state and non-state woodland in NI is increasing, however, whilst the public was granted access to Forestry Service grant-aided woodland in March 2013. The latter are not necessarily open to the public, however, still represent an important component of NI's green infrastructure network.

Tourism in NI supported around 70,803 in 2019, a 9% increase on the 2017 figures. In 2019, NI welcomed 5.3m visitors, an estimated record breaking expenditure of £1bn (£76m or 8% more compared with 2018), whilst £2.9m was spent on average each day during Jan-Dec 2019 (NISRA, 2019). The most recent estimate (2018) for NI Gross Value Added stood at £42.2 billion indicating that spending on overnight trips broadly equates

to around 2.5% of the local economy (NISRA and DoF, 2020). The depth and wealth of food and drink produced in NI, along with high quality natural and cultural landscapes and authentic surroundings demonstrates the potential to increase the contribution tourism makes to the NI economy.

Previously, Ireland's 2016 State of the Environment report identified seven key environmental actions which related to environmental and health/wellbeing, climate change, implementation of environmental legislation, water quality, sustainable economic activities, nature and wild places and community engagement. The Ireland's 2020 State of the Environment report accounts for the 2016 environmental key actions for the protection of the environment in Ireland as still relevant, as these actions were considered when developing SOE messages (overall key messages).

3.13 Key Environmental and Sustainability Issues

According to an annual survey carried out by NISRA, in 2020/21 the most commonly selected environmental problems were illegal dumping of waste and litter (34%), Climate change and ozone layer depletion (23%) and pollution of air, water and soil (14%).

Due to the methodology of the survey changing due to the COVID-19 pandemic the results are not directly comparable with previous years however similar trends in opinions can be seen. In 2016/17, 34% of responding households thought the most important environmental problem facing NI is the illegal dumping of waste, followed by pollution in rivers (30%), climate change (27%), litter (26%) and traffic congestion (24%) (multiple responses were permitted). These environmental problems were also identified as the most important in the 2015/16 survey and 2014/15 survey (apart from litter which was a new option added to the questionnaire in 2015/16). Previously household waste disposal was considered the most important environmental problem but in recent years this has fallen to 11%. Concern for climate change saw a sharp rise in 2005/06 and was seen as the most important issue between 2006/07 and 2010/2011 followed by a steady fall in recent years. There has also been a notable decline in concern regarding air pollution over the last decade (NIEA and DAERA, 2018). A similar survey carried out by NISRA focusing on the attitudes of young people in NI found (in 2010) that the greatest environmental concern was the loss of plants, animals and habitats (76% of respondents) (NISRA, 2011).

From analysis of the baseline data, the key sustainability issues facing NI are thought to be:

Ecology and Nature Conservation

- The findings of NICS carried out in 2007 were reconfirmed by the NBN State of Nature Report (2019) which revealed continued loss of semi-natural habitat by agricultural conversion and building. This is a particular concern in lowland landscapes, where semi-natural habitats are already small and fragmented.
- A significant proportion of NI's habitats and species are in unfavourable condition. The NI Environmental Statistics Report revealed that 35% of ASSI features are classed as unfavourable with only an additional 4% of features classed as unfavourable recovering.
- Out of 57 actions set out in the 2015 Valuing Nature Strategy for Northern Ireland only 32 had been achieved by 2020.

- There is limited information on the current status of peatland, whilst 90% of lowland raised bogs have been lost or altered due to peat extraction, forestry and drainage.
- With increasing demand for food and declining quantities of productive farmland, a move towards intensive agriculture in NI is threatening biodiversity (DOE, 2015).
- Overall, ammonia emissions have increased by 8.5% between 2001 and 2019.
- Analysis shows that there has been a deterioration trend in the water quality of NI's waterbodies since previous surveys, as winter DIN has increased (DAERA, 2021).
- Increased movement of biological materials around the world for trade is leading to introduction of new pests and diseases, whilst invasive species are affecting rural land across NI.

Population: Health and Quality of Life

- One of the NIMDM used by the NI Government to help target those in need looks at 'access to services'. This indicator identifies particular problems of fair and equitable access to services and public transport frequency and connectivity for rural dwellers throughout NI, which has subsequent impacts on vulnerable groups such as low income households, the elderly, children and young people, and those with disabilities.
- Obesity rates for adults in NI, at 27%, are extremely high compared to elsewhere in Europe. Since the outbreak of the COVID-19 pandemic physical activity had also gotten poorer; with 31% reporting doing less physical activity and 23% of respondents reported eating less healthily (Information Analysis Directorate, Department of Health, 2021).
- Access to woodland for exercise, mental health and educational purposes is poor in NI.

Population: Socio economics

- Access to local rural transport services can be limited in terms of routes and frequency; rural transport provision is often uncoordinated.
- In 2019/20, in NI there were 313,000 people in relative poverty and 241,000 in absolute poverty, which equates to 17% and 13% of the population respectively.
- NI remains one of the most deprived regions of the UK as a combined result of having a young population, low labour market participation rates, a high rate of economic inactivity, a larger share of employment in sectors of low productivity and below average wages.
- The employment rate in NI over the period November-January 2022 was at 70.4%, lower than the UK average of 75.5%.
- The long-term unemployment rate has an increased share of persons in long-term unemployment (42.5%) in comparison with the unemployment rate in September-November 2020.
- The current claimant count is approximately 41,200 in January 2022 (4.2% of the workforce), which is 35% higher than the pre-pandemic count in March 2020.

- The number of people of working age with high level skills increased from 30.2% in 2007 to 38.4% in 2017. This remains below the 42.7% average of the UK as a whole.

Soil and Land Use

- Currently less than 10% of NI farmland has an up-to-date soil analysis, whilst 64% of soils are not at optimum pH.
- There is limited information on the current status of peatland in NI, particularly with regards to soil structure, pH and nutrient profiles.
- Recent condition assessment for peatland SACs and ASSIs has demonstrated that a high proportion of the designated sites are generally 'unfavourable' or 'unfavourable-recovering' condition (DAERA, 2021).
- NI has the lowest level of tree cover (8.7%) of any UK regional territory. Much of the woodland lacks active management, is fragmented and not easily accessible by the public due to distance from residential areas.

Water

- In 2018, only 31% of waterbodies in NI were classed as having good or high quality.
- The NIEA investigate water pollution incidents. In 2019, 1,754 incidents were reported or discovered during inspections, of which 53.6% had an impact on the water quality of the receiving waterway.
- A lack of nutrient management plans on livestock farms and unsustainable use of fertilisers has resulted in nitrate, ammonia and phosphorous pollution of many of NI's lakes and rivers, with knock-on effects on ASSIs and Natura 2000 sites with aquatic features.

Air Quality

- Ammonia emissions from livestock increased by 6.9% since 2001. Overall ammonia emissions have increased in NI by approximately 8.5% from 2001 to 2019 (DAERA, 2021).
- Access to local rural transport services is generally limited in terms of routes and frequency and rural transport provision is often uncoordinated. This results in the majority of the rural population being reliant on cars, adding to emissions that affect air quality.

Climate Change

- Mean annual maximum and minimum temperatures have been rising since the end of the 19th Century; by the end of the 20th century, the ten-year moving average temperature had risen to its highest levels since the temperature records began. The 2005 - 2014 decade was 0.7°C warmer than the 1961-1990 average. Such changes in temperature extremes have implications for agriculture and health, as agriculture is highly susceptible to disruption due to climate change.
- The third UK Climate Change Risk Assessment (CCRA3) published in 2022, assesses 61 risks and opportunities from climate change to NI. Action is needed now to address over half of the risks and opportunities (31 of them).

- The PfG sets a target of a reduction of 35% in greenhouse gas source emissions by 2025 from the base year. The most recent DAERA projections demonstrate that NI is not likely to achieve this level of emissions reductions through existing policies.
- Access to local rural transport services is generally limited in terms of routes and frequency and rural transport provision is often uncoordinated. This results in the majority of the rural population being reliant on cars, adding to emissions that affect climate change.

Material Assets

- There has been a trend of escalation of total amount of local authority collected (LAC) municipal waste, with a 12.9% increase between 2012/13 and 2020/21. In 2020/21, there has been a 3.2% increase on 2019/2020 figures.
- Agriculture is highly susceptible to disruption due to climate change and extreme weather events such as prolonged periods of rainfall, drought and snow.

Historic Environment and Landscape

- There is a lack of coordination across the rural tourism sector, with many opportunities for sharing and promoting NI's exceptional landscapes and cultural heritage being missed.
- Landscapes in NI have been affected by rural development, including housing and infrastructure, as well as agricultural intensification.
- Semi-natural grasslands have declined significantly over the last 60 years due to fragmentation and agricultural intensification.

Natural Capital

- Diverse objectives and aspects of GI (particularly regarding the creation of multifunctional networks) require agreement or cooperation of varied stakeholders such as Local Authorities and landowners, in a participatory planning process. No mechanism for such co-operation currently exists in NI (a good model is the Central Scotland Green Network, a National Project in both the existing and proposed National Planning Frameworks).
- NI is also susceptible to transboundary effects with the ROI, particularly in relation to water bodies, biodiversity, landscape and climate, and for activities taking place in border, coastal and marine areas. Conversely, NI may cause similar transboundary effects in Ireland.
- There is a disparity to public access to woodland in NI, with most being located far from where people live. Whilst 72% of NI's woodland is publicly accessible, only 7.2% of the population has access to a 2 ha+ woodland site within 500 m of their home.
- In light of the above point on transboundary effects, the key environmental issues in Ireland may also be of relevance.

4 SEA FRAMEWORK

4.1 SEA Objectives

The purpose of the SEA Objectives is to ensure that the assessment process is transparent and robust and that the review of the renewable & low carbon energy policy considers and addresses potential environmental effects. SEA Objectives (including more detailed sub-objectives) have been set for each of the ten sustainability topics outlined in Section 2.3.

The SEA Objectives are deemed to be appropriate based on the other relevant plans and programmes, baseline conditions and potential impacts identified in NI (as described in the preceding chapters), but may change as the assessment process develops. In order to address recently highlighted concerns on the effects that human activities have had on the world's ecosystems, and on the public benefits that ecosystems provide, an additional SEA Objective on Natural Capital is provided as part of the ecosystems approach to this SEA. The proposed SEA Objectives are detailed in Table 4.1 below.

Table 4.1: SEA Objectives

SEA Objective	Sub-objective (Will the Renewable & Low Carbon Energy policy…?)
1. Ecology and Nature Conservation – Protect, enhance and manage biodiversity assets and ecosystems	a. Maintain and enhance internationally and nationally designated terrestrial, freshwater and marine designated sites, specifically SPAs, SACs, Ramsar sites and Natural Heritage Areas b. Maintain and enhance locally designated sites c. Maintain and restore terrestrial, freshwater and marine habitats, species and natural heritage sites d. Maintain and enhance priority habitats and species e. Prevent, minimise or address the spread of invasive species f. Protect and maintain migratory species, connectivity and cross border habitats
2. Population: Socio-economics – Reduce deprivation and improve social cohesion of the community	a. Improve accessibility to education, employment, housing and community facilities/services b. Reduce deprivation, inequality and energy poverty c. Create Green Jobs
3. Population: Health and Quality of Life – Improve health and quality of life	a. Improve long-term health and wellbeing b. Encourage walking, cycling and other physical activity c. Reduce health deprivation d. Minimise the number of people and species exposed to and levels of noise and vibration pollution e. Improve the quality of living, working and recreational environments
4. Soil and Land Use – Protect and enhance soil quality	a. Safeguard and improve the highest quality soil and agricultural land b. Reduce soil pollution, compaction, erosion and degradation

SEA Objective	Sub-objective (Will the Renewable & Low Carbon Energy policy…?)
	c. Encourage local production of fuel d. Encourage use of previously developed land e. Remediate contaminated land
5. Water – Protect, enhance and manage water resources and flood risk	a. Protect water resources from over-abstraction and pollution b. Improve the quality of surface water, groundwater and marine c. Protect and enhance the status of aquatic and wetland ecosystems d. Minimise exposure to flood risk and droughts
6. Air Quality – Reduce air pollution and ensure continued improvements to air quality	a. Improve air quality b. Minimise nitrogen deposition on designated sites and priority habitats d. Improve access to and encourage the use of sustainable modes of transport
7. Climate Change – Minimise contribution to climate change and adapt to its predicted effects	a. Improve energy conservation and efficiency b. Improve the climate change resilience and adaption capacity of the sector c. Minimise emissions from transport, industry and agriculture d. Encourage land management that protects and captures carbon, particularly from peatlands and forests e. Improve resilience of habitats and the water environment to climate change impacts f. Minimise and adapt to flood risk, storms, changing rainfall patterns and varying / more extreme temperatures g. Minimise the impacts of new infrastructure in the transition to renewable energy
8. Material Assets – Protect and conserve natural resources and reduce waste production	a. Safeguard natural resources (including minerals, forestry and peatland) and minimise unsustainable use b. Increase recycling rates and re-use of materials c. Minimise production of waste and quantity sent to landfill d. Improve waste management in terms of its financial costs and environmental and health impacts e. Maximise use of the existing built environment
9. Cultural Heritage – Protect, enhance and manage archaeological and cultural heritage	a. Preserve and enhance designated and non-designated sites and areas and their settings b. Preserve and enhance archaeological sites and the setting of historical and architectural assets including marine cultural heritage c. Encourage urban renewal and improve the quality and character of the townscape d. Protect, conserve and enhance historic landscapes and their settings
10. Landscape – Protect, enhance and manage the character and quality of the landscape	a. Maintain and enhance the quality and character of landscape, seascape and coastal areas b. Maintain and enhance designated sites, public open space and green infrastructure assets

SEA Objective	Sub-objective (Will the Renewable & Low Carbon Energy policy…?)
	c. Maintain and enhance cross border landscapes d. Minimise light pollution and light spill
11. Natural Capital and Inter-relationships – To support the transition to renewable energy while maintaining natural capital benefits including carbon sequestration, protection from flooding and access to the countryside.	a. Preserve and enhance the ability of an area to provide ecosystem services such as carbon sequestration and flood resilience, as well as supporting other ecosystem services b. Encourage multifunctionality of land used for renewables to provide numerous ecosystem services simultaneously c. Encourage biophysical changes such as restoration of degraded land and enhanced connectivity of habitats and greenspace d. Strengthen positive natural connections and interactions between different areas and regions e. Improve knowledge and understanding of the environment

5 ALTERNATIVES AND SCOPE OF THE SEA

5.1 Consideration of Alternatives

Consideration of alternatives is a key feature of the SEA process as defined by the Northern Ireland Regulations. The ODPM (now DCLG) guidance on SEA recognises that it is not for the SEA to decide on the options to be considered. Instead the SEA should focus on the alternative delivery options actually considered in the preparation of the Policy document. These should be identified by the Department as the body responsible for the Policy review. The SEA will then assess which of the identified options, or combination of options performs the best environmentally.

The alternatives to be considered in the review of the emerging renewable & low carbon energy policy area are currently being discussed between the Department, stakeholders and the SEA team. It is considered that there may be different types of alternatives for the Policy area, and key questions to inform those alternatives include:

- **What elements of the policy are regionally important?** Changes in context may mean some elements of the policy are no longer as significant, or appropriate for regional policy and new policy provisions may be required. This will have a bearing on the themes to be addressed and the level of policy prescription to be applied.
- **Which policy approach?** There will be a number of specific policy themes for this topic which will require consideration in the context of the policy development process overall. It may be the case that some elements of the existing Policy position will remain unchanged, and that reasonable alternatives will be limited. In other areas, a consideration of further policy options may be helpful. Where appropriate, it will also be important to consider the various policy approaches and reasonable alternatives for their interrelationship with the separate marine planning and licensing system.
- **Which words express the intentions of the policy most clearly?** The way the document is scrutinised means that the nuances of words are important to the policy being applied as intended.

The SEA will focus only on the reasonable alternatives that emerge during the review of the Renewable & Low Carbon Energy policy area and will explain why other alternatives are not considered to be 'reasonable' and will not, therefore, be subject to assessment and consultation.

The initial options being considered for the Policy include:

- Do nothing and retain the existing strategic planning policy approach;
- Policy change comprising a more supportive approach to future renewable & low carbon energy development; and
- Policy change comprising a more restrictive approach to future renewable & low carbon energy development.

5.2 Likely Significant Effects of Renewable & Low Carbon Energy Policies

The emerging Renewable & Low Carbon Energy policy area has the potential for significant adverse effects on the environment because of its role within the SPPS, a strategic planning policy document, with influence on local development plans and individual development proposals. However, the actual impact will depend upon the nature and location of the development. As the Policy area will include development, it has the potential to have adverse impacts, for example on landscape, ecology and air and water quality.

However, beneficial effects are also likely to occur. An increase in the contribution of renewable energy to the overall energy mix will likely have beneficial effects through reduced dependence on fossil fuels, carbon emissions and increased diversity and energy security. The policy on Renewable & Low Carbon Energy could have beneficial effects on climate change, health and flood risk.

5.3 Scope of the SEA

The scope of the SEA is proposed to cover the Renewable & Low Carbon Energy policy in full. The scoping process has revealed that due to the likelihood of the policy having uncertain or adverse effects on the environment, and/or because key environmental and sustainability issues have been identified in NI, the following sustainability topics should be carried forward to Stage B of the SEA process:

- Ecology and Nature Conservation;
- Population: Socio-economics;
- Population: Health and Quality of Life;
- Soil and Land Use;
- Water;
- Air Quality;
- Climate Change;
- Material Assets;
- Cultural Heritage;
- Landscape; and
- Natural Capital.

6 NEXT STEPS

6.1 Consulting on the Scope of SEA

As stated in section 2.2 of this report, the SEA Guide produced jointly by the four UK governments in 2005, in common with other SEA guidance documents, sets out a five stage process (A to E) for carrying out SEA. As was revealed in Table 2.1, consulting on the scope of SEA is sub-stage A5.

The Northern Ireland Regulations require the Consultation Bodies to be consulted on the scope and level of detail of the information which must be included in the Environmental Report. The Regulations do not require full consultation with the public or bodies other than Consultation Bodies until the Environmental Report on the draft plan or programme is finalised.

This Scoping Report has been issued to the relevant Consultation Body for NI, the NIEA, on behalf of the Department. Due to the possibility of transboundary effects, this Scoping Report has also been issued to the following Consultation Bodies in the Republic of Ireland: the EPA, the Department of Housing, Local Government and Heritage (DHLGH), the Department of the Environment, Climate and Communications (ECC), the Department of Agriculture, Food and the Marine (DAFM).

Consultation Bodies must provide a view, once consulted, within five weeks and copy their responses to the other Consultation Bodies. This Scoping Report has also been published on the Department's website (for information only).

6.2 Stage B: Developing and Refining Alternatives and Assessing Effects

This stage of the SEA process, the second of five main stages, involves the identification and evaluation of the likely significant effects on the environment of implementing the policy and its reasonable alternatives. This will be carried out in three stages:

- Prediction of the adverse, beneficial, neutral and uncertain effects of the policy on the environment (i.e. biodiversity, flora and fauna (including Natura 2000 sites); population and human health; water; air; climate factors; material assets; cultural heritage; landscape; and the inter-relationship between these), in light of the baseline conditions identified in the Scoping Report. This will be carried out by way of a matrix assessment (Renewable & Low Carbon Energy policy measured against SEA Objectives).
- Prediction of the adverse, beneficial, neutral and uncertain effects of the alternatives, the 'zero option' (the likely evolution of the environment without implementation of the amended policy), and any in-combination effects with other relevant plans or programmes.
- Evaluation of the likely adverse or uncertain effects identified in the above assessments to determine their significance, and assist in the refinement of the policy. This will be done using a more detailed and descriptive matrix assessment, and will include consideration of short, medium or long-term effects, permanent or temporary effects, secondary, cumulative or synergistic effects, and transboundary effects.

The Northern Ireland Regulations require that reasonable alternatives be considered in the development and environmental assessment of plans and programmes. The development and refinement of realistic strategic alternative approaches will be carried out in consultation with Department throughout the review of The Policy. The reasons for selecting the alternatives dealt with, including the chosen option, will be outlined in the Environmental Report, with reference to their likely environmental impacts.

6.3 Stage C: Preparing the Draft Environmental Report

Stage B of the SEA process will culminate in the production of the Draft Environmental Report (Stage C). The Draft Environmental Report will be structured similarly to this Scoping Report, and will be as required by the Northern Ireland Regulations. The proposed structure of the Draft Environmental Report is as follows:

- Outline of contents, comments received on the Scoping Report, SEA objectives and relationship with other plans and programmes;
- Environmental protection objectives that are relevant to the Renewable & Low Carbon Energy policy, and a description of how these have been accounted for in the preparation of the document;
- Description of the current state of the environment, likely future trends in the absence of the amended Renewable & Low Carbon Energy policy, and key environmental and sustainability issues facing NI;
- Consideration of Alternatives;
- Matrix assessment of the Renewable & Low Carbon Energy policy against the SEA objectives and determination of likely significant effects;
- Schedule of mitigation measures aimed at avoiding, reducing or offsetting any potentially significant environmental effects;
- Acknowledgement of data gaps or technical deficiencies;
- Suggestions of measures to monitor the environmental effects of implementation of the amended Renewable & Low Carbon Energy policy, including success or otherwise of mitigation measures; and
- Non-technical summary.

6.4 Stage D: Consultation and Decision Making

The Draft Environmental Report (including NTS) will be presented for public and statutory consultation during the same 12 week period as the draft Renewable & Low Carbon Energy policy. The statutory Consultation Body for NI is NIEA (on behalf of the Department). If transboundary effects are thought likely, the Draft Environmental Report will also be issued to the relevant Consultation Bodies in the Republic of Ireland. Members of the public likely to participate in SEA consultation are those affected or likely to be affected by, or having an interest in the decision-making, including relevant non-governmental organisations, such as those promoting environmental protection.

The purpose of this stage is to give the public and the Consultation Bodies an opportunity to express their opinions on the findings of the Draft Environmental Report, and to use it as a reference point in commenting on the review of the Renewable & Low Carbon Energy policy. In line with the NI SEA Regulations, the Department must take account of the Draft Environmental Report and of any opinions which are expressed upon it as it

prepares the revised policy for adoption. Therefore, comments received from NIEA, members of the public and other stakeholders during the consultation process will be reviewed to determine their relevance. These will be addressed in the final Environmental Report where necessary by means of an annex containing consultation responses and details of how they have been accounted for. The final Environmental Report must be taken into account in the final published Renewable & Low Carbon Energy policy.

Once the Renewable & Low Carbon Energy policy has been adopted, an SEA Post-Adoption Statement will be produced to provide information on how the Environmental Report and consultees' opinions were taken into account in deciding the final form of the Renewable & Low Carbon Energy policy.

6.5 Stage E: Monitoring Implementation of the Programme

The Northern Ireland Directive requires the Department, as the Managing Authority, to monitor significant environmental effects of implementing the Renewable & Low Carbon Energy policy. This must be done in such a way as to also identify unforeseen adverse effects and to take appropriate remedial action.

If significant effects are identified, a monitoring programme will be proposed in the form of a Monitoring Framework Document (and summarised in the accompanying SEA Post-Adoption Statement) so that the actual impacts of the policy can be evaluated.

It may be possible to incorporate monitoring of the effects of the Renewable & Low Carbon Energy policy within the existing monitoring framework. The SPPS includes a sub-section on 'Implementation, Monitoring and Review'. This includes a requirement for local councils to review the implementation of their plans and report annually to the Department on the extent to which the objectives set out within an adopted Local Development Plan have been met.

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APPENDIX A: REVIEW OF OTHER PLANS, PROGRAMMES AND ENVIRONMENTAL PROTECTION OBJECTIVES

APPENDIX A: REVIEW OF OTHER PLANS, PROGRAMMES AND ENVIRONMENTAL PROTECTION OBJECTIVES

Plan or Programme	Main objectives and environmental / socio-economic requirements of the Plan or Programme	How the Renewable Energy SPPS Policy affects, or is affected by other Plans/ Programme.
Northern Ireland		
Energy Strategy - Path to Net Zero Energy 2022	The Energy Strategy sets out a pathway for energy to 2030 that will mobilise the skills, technologies and behaviours needed to take us towards our vision of net zero carbon and affordable energy by 2050. It includes the promotion of energy efficiency, renewable electricity and renewable energy sources. (This replaces the Strategic Energy Framework which ran from 2010 to 2020).	The Strategies policy framework includes 'Replacing Fossil Fuels with Renewable Energy' and others relating to reducing GHG emissions to zero and decarbonisation. The Policy will directly contribute to the objectives of this Strategy.
Green Growth Strategy for Northern Ireland. (Consultation December 2021) launched in 2022.	The Green Growth Strategy is the Northern Ireland Executive's multi-decade strategy, balancing climate, environment and the economy in Northern Ireland. It sets out the long-term vision for tackling the climate crisis in the right way. It will be delivered through a series of Climate Action Plans.	The Green Growth Strategy is aligned with a net zero deadline of 2050 and is strongly focussed on decarbonisation and sustainability. Therefore the Policy supports the principles of the strategy.
Forests for Our Future	The 'Forests for Our Future' programme which commits to planting 18 million trees in Northern Ireland over the next 10 years, creating 9,000 hectares of new woodland.	The Policy may create a trade-off between land allocated for renewable energy schemes and that allocated for tree planting.
Programme for Government (PfG) Framework (2021)	Public consultation was held between 25 Jan and 22 Mar 2021 and the draft framework contains nine strategic Outcomes which set a clear direction of travel for the NI Executive and provide a vision for the future of all citizens. Among these nine outcomes are: 'Protecting the environment' and 'Having a good economy' (which includes growing the economy while being friendly to the environment).	The Policy will facilitate renewable and low carbon energy development which will create green jobs and reduce dependence on imported fossil fuels, in turn creating a healthier environment for NI citizens.
New Decade, New Approach agreement (published Jan 2020)	New Decade, New Approach was intended to help transform public service provision in Northern Ireland. The new restoration deal states a number of measures and actions to be taken by the NI Executive in relation to addressing climate change and emissions including the new Energy Strategy (2022), Climate Change Act, and the establishment of an Independent Environmental Protection Agency.	The Policy will facilitate renewable and low carbon energy developments which reduces dependence on fossil fuels. This will contribute towards NI's targets for reducing carbon emissions and reduces environmental damage. The Policy is therefore in line with the New Decade, New Approach agreement.
Investment Strategy for Northern Ireland 2050	A new strategy has been created by the Strategic Investment Board in collaboration with The Executive Office and Department of Finance to replace the previous ISNI which ran from 2011 to 2021. It helps to identify priority areas	One of the five key objectives of this Strategy is to; 'Decarbonise our economy and society'. Renewable and low carbon energy will play a key role in

(consultation closed on 20 April 2022)	for investment, covering five key objectives, one of which is to decarbonise the economy and society.	decarbonisation and therefore the Policy will contribute to the objectives of the strategy.
Northern Ireland Climate Change Adaptation Programme 2019-2024	The UK Climate Change Act 2008 requires NI departments to prepare an Adaptation programme. DAERA took the lead in developing the NICCAP2 which sets policies, strategies and actions for NICS Departments to address climate change and it is hoped it will raise awareness and encourage wider society and local government to adapt/address climate change.	The Policy is in alignment with the Programme as it will facilitate the siting of renewable energy developments. Renewable energy reduces the dependence on fossil fuels and in turn will help to reduce carbon emissions and address climate change.
GHG Emission Reductions Plan	This plan will set out how the NI Government intend to reduce Greenhouse Gas (GHG) emissions in the following sectors: agriculture; energy; transport; business; residential; land use change; public; waste management; and industrial processes. The plan, once drafted and agreed by the Future Generations Working Group on Climate Change (FGWG CC) will be submitted to the NI Executive for their agreement.	The Policy is in alignment with the Plan as It will facilitate the siting of renewable and low carbon energy generating facilities which will reduces the dependence on fossil fuels which produce carbon dioxide and other GHG's.
New Circular Economy Strategic Framework (Due 2022)	DAERA and the Department for Economy (DfE) are working to develop a framework for the Circular Economy in NI. A Cross Departmental Steering Group has been set up. The aim is for increased collaboration and partnership working amongst CE stakeholders and more joined-up activity between Governmental Departments, local government and the private sector on CE issues.	The Policy will not directly affect or be affected by the Strategy however they serve a common purpose to contribute to the NI net zero ambition.
Waste Management Plan for Northern Ireland (2019)	This aims to consolidate current waste policies, including those detailed in the current NI strategy, 'Delivering Resource Efficiency' – Northern Ireland Waste Management Strategy, and regional waste management plans under one strategic plan with a focus on the circular economy and planning policy in one document. It should also be in line with the new Environment Strategy.	The Policy will not directly affect or be affected by the Plan however they serve a common purpose to contribute to the NI net zero ambition.
Environment Strategy (Consultation closed on 18 January 2022)	DAERA is currently developing an Environment Strategy which covers climate change mitigation and adaptation, and GHG reductions among other key areas. The Strategy is intended to be an overarching document setting out Northern Ireland's environmental priorities for the coming decades and will form part of the Green Growth agenda.	A key outcome the Strategy sets out to achieve is "Production and consumption that doesn't damage our environment". The policy will help to achieve this outcome through facilitating more electricity to be produced from renewable sources.
NI Marine Plan (2018)	The Plans vision is "A healthy marine area which is managed sustainably for the economic, environmental and social prosperity of present and future generations". Objective 7 of the Plan is to contribute towards climate change mitigation and adaptation measures.	The Policy will facilitate renewable energy generating facilities in appropriate locations. However, any expansion in the renewable energy sector could impact on the marine environment and would have to align with the NI Marine Plan.
NI Future Agricultural Policy Framework (published August 2021; consultation closed 15 Feb 2022)	The Framework charts the way forward for a future agricultural policy which better meets Northern Ireland's needs. It aims to achieve four key outcomes: increased productivity, environmental sustainability, improved resilience, and an effective functioning supply chain, in order to develop a future sustainable agricultural policy.	The policy has the potential to work alongside the Agricultural Policy as renewable energy generation can offer an opportunity to diversify a farm business, as well as offsetting emissions from other farm activity and reduce energy costs.

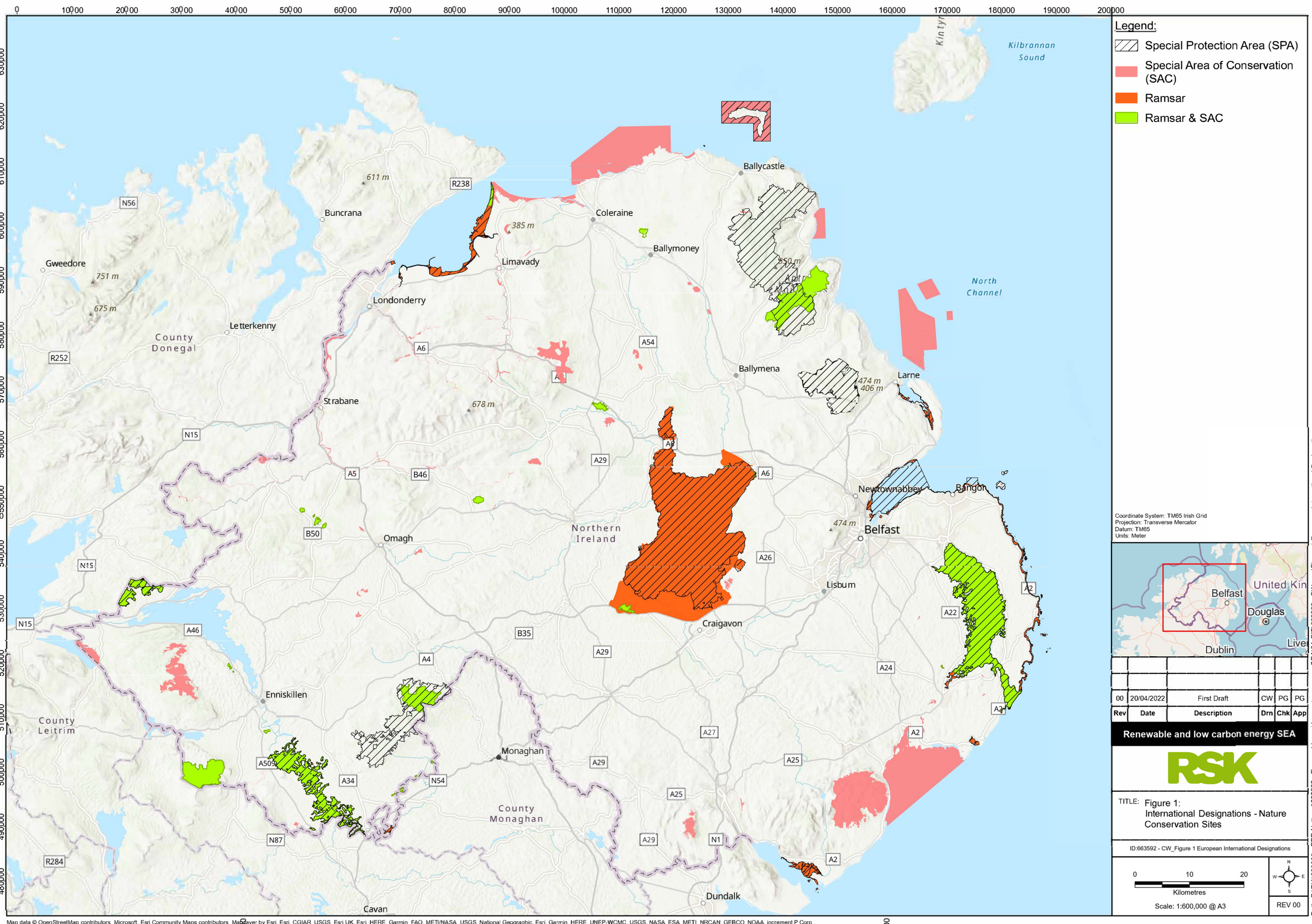
Economic Strategy (2012)	Provides details on the Executive's proposals for growing a prosperous local economy to 2030. It explores options for exploiting market opportunities in emerging sectors aimed at addressing climate change, such as low carbon/green economy. A new draft Strategy (Economy 2030) was published in 2017, however it never progressed. There have been calls to develop a new Economic Strategy for NI especially in light of COVID-19 and Brexit.	The Policy will facilitate the siting of low carbon and renewable energy generating facilities which will align with the strategies aim to grow the green economy.
New Skills Strategy – 'Skills for a 10X Economy' (published 25 March 2022)	Developed by the DfE based on advice given by OECD regarding the fact that climate change action will have substantial implications for labour market demand. It puts emphasis on 'green jobs' and existing jobs being transformed to meet new demands.	The Policy will facilitate the siting of low carbon and renewable energy generating facilities which will align with the strategies aim to grow the green economy and create green jobs.
Energy Management Strategy and Action Plan to 2030 (launched June 2019)	This strategy seeks to demonstrate the Government's commitment to emission reductions. One of the ways it hopes to contribute is an objective to lower net energy consumption by 30% by 2030 across Government (from a 2016/17 baseline year).	The priority of this Strategy and Action Plan is to reduce energy consumption in the first instance. Renewable generation opportunities would be considered after eliminating waste and improving energy efficiency and therefore the Policy will contribute towards this.
Regional Development Strategy (RDS) 2035 (published in 2012)	This strategy aims to take account of the economic ambitions and needs of the Region, and put in place spatial planning, transport and housing priorities that will support and enable the aspirations of the Region to be met. It sets out measures on transport, energy and the location of jobs and houses to help address and adapt to climate change.	The Policy will work alongside the RDS to facilitate renewable and low carbon energy development in the correct locations taking into account the needs of the region.
Northern Ireland Sustainable Energy Programme 2019-2020	Administered by the Energy Saving Trust on behalf of the Utility Regulator, NISEP is an £8 million fund which is collected from all electricity customers (both domestic and commercial) through a public service obligation (PSO) and is used to provide funding for energy efficiency schemes across NI. The majority of the funding has been targeted at vulnerable customers/householders to help install energy efficient heating systems and insulation, while other schemes help businesses install carbon saving technologies, e.g. intelligent heating controls.	The Policy will not directly impact on the output of the Programme however it will indirectly contribute by expanding the use of renewables into the energy mix.
A Biodiversity Strategy for Northern Ireland to 2020. A new strategy is presently under preparation by DAERA which will replace the Biodiversity Strategy 2020. It is expected that the new Biodiversity Strategy will look forward to 2032.	The current Biodiversity Strategy 2020 recognises that renewable energy offers the potential for wider environmental benefits through mitigating greenhouse gas emissions from energy generation. It also recognises the potential adverse impacts which renewable energy can pose during construction and operational phases – for example, impacts of noise, collision risks and barriers to migrations. Planning and licensing systems are cited as a means of regulation so that renewable energy projects can realise their potential for contributing to climate change mitigation while ensuring sustainable development is achieved.	The Policy will facilitate the siting of renewable and low carbon energy generating developments in appropriate locations taking into account the effects on biodiversity and the forthcoming Biodiversity Strategy to 2032.

Northern Ireland Peatland Strategy 2021-2040. Consultation Document 2021	DAERA is currently developing a peatland strategy which identifies the ecosystem services provided by healthy peatlands, including climate regulation and adaptation. Consultation on the draft Peatland Strategy ran from 9 June 2021 until 1 September 2021. In the context of the 'UK Net Zero Target', the Strategy acknowledges the important contribution that peatlands make to current emissions and as a potential carbon sink and on this basis, a number of Strategic Objectives and Priority Actions are set out to provide for peatland conservation and restoration. In terms of renewable energy, the potential impacts of wind farms on peatlands are set out including direct habitat loss through construction of wind farm infrastructure and habitat modification as well as habitat loss if there are adverse changes to the overall hydrology and structural integrity of the peatland.	The Policy will facilitate the siting of renewable and low carbon energy generating developments in appropriate locations taking into account effects on important habitats such as peatlands and the forthcoming Peatland Strategy to 2040.
UK		
HM Government, Northern Ireland Executive, Scottish Government and Welsh Assembly Government (2011) UK Marine Policy Statement	The MPS will facilitate and support the formulation of Marine Plans, ensuring that marine resources are used in a sustainable way in line with the high level marine objectives and thereby: ▪ Promote sustainable economic development; ▪ Enable the UK's move towards a low-carbon economy, in order to mitigate the causes of climate change and ocean acidification and adapt to their effects; ▪ Ensure a sustainable marine environment which promotes healthy, functioning marine ecosystems and protects marine habitats, species and our heritage assets; and Contribute to the societal benefits of the marine area, including the sustainable use of marine resources to address local social and economic issues.	The Policy will facilitate low carbon and renewable energy generating facilities in appropriate locations. However, any expansion in the renewable energy sector could impact on the marine environment and would have to align with the UK Marine Policy Statement.
Clean Air Stratagy (2019)	This strategy sets out our plans for dealing with all sources of air pollution, making our air healthier to breathe, protecting nature and boosting the economy.	The Policy aligns with the Clean Air Strategy which will work to support new energy technologies and reduce the cost of renewables.
Net Zero Stratagy: Build Back Greener	This strategy sets out policies and proposals for decarbonising all sectors of the UK economy to meet our net zero target by 2050.	Renewable energy will play a key role in decarbonisation and therefore the Policy is in alignment with the Strategy.
Transboundary Considerations		
EPA (2018) River Basin Management Plan for Ireland 2018-2021	This second River Basin Management Plan (RBMP) outlines the new approach that Ireland will take as it works to protect its rivers, lakes, estuaries and coastal waters over the next four years. The following evidence-based priorities have been adopted for this river basin planning cycle:	Renewable energy proposals under the Policy will take into account its transboundary effects on water in line with the River Basin Management Plan for Ireland and its priorities.

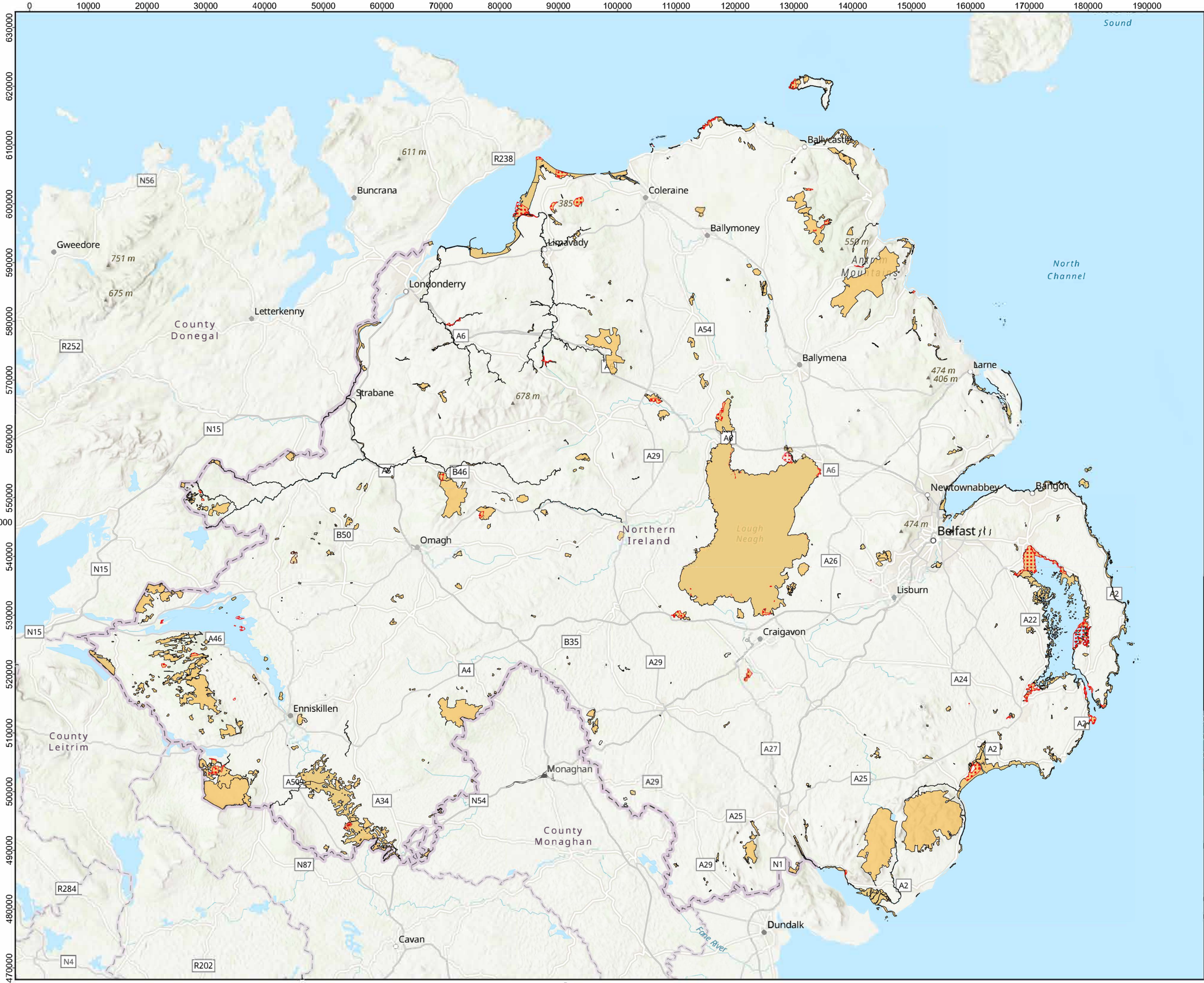
	• Ensure full compliance with relevant EU legislation • Prevent deterioration • Meet the objectives for designated protected areas • Protect high-status waters Implement targeted actions and pilot schemes in focused sub-catchments aimed at (1) targeting water bodies close to meeting their objective and (2) addressing more complex issues that will build knowledge for the third cycle	
DCHG (2017) National Biodiversity Action Plan (NBAP) 2017-2021 Work on drafting Ireland's 4th NBAP is underway which will go for public consultation and launch in 2022.	The NBAP for 2017-2021 demonstrates Ireland's continuing commitment to meeting and acting on its obligations to protect their biodiversity for the benefit of future generations through a series of targeted strategies and actions. The plan has seven objectives; 1. Mainstream biodiversity into decision-making across all sectors 2. Strengthen the knowledge base for conservation, management and sustainable use of biodiversity 3. Increase awareness and appreciation of biodiversity and ecosystems services 4. Conserve and restore biodiversity and ecosystem services in the wider countryside 5. Conserve and restore biodiversity and ecosystem services in the marine environment 6. Expand and improve management of protected areas and species 7. Strengthen international governance for biodiversity and ecosystem services.	The Policy will facilitate the siting of renewable energy generating facilities in appropriate locations taking into account the local and transboundary effects on biodiversity.
DAHG (2015) National landscape strategy for Ireland (2015-2025)	A key objective of this strategy is to implement the European Landscape Convention. It highlights the importance of cultural, social, economic and environmental values within Ireland's landscapes. It aims to both support living landscapes and enhance community identity by understanding, protecting, managing by improving the quality of the landscape in decision making.	The Policy will facilitate the siting of renewable energy generating facilities in appropriate locations taking into account transboundary effects on landscape.
National Climate Change Adaptation Framework (Ireland) (2012)	The policy contained in this framework provides a strategy for the response to climate change in Ireland and is intended to evolve and adapt over time as planning and implementation progresses. The aim of this plan is to help people deal with disruptions from the impacts of climate change and help them reduce them; comprehend the changes necessary to improve their quality of life; and facilitate economic recovery from possible changes to climate patters and extreme events.	The Policy will facilitate renewable energy in NI which will play a key role in decarbonisation and mitigating and responding to climate change.
DCCAE (2018) National Adaptation Framework: Planning for a Climate Resilient Ireland	This framework sets out a whole-of-government basis, what Ireland is doing and is planning to do to further their transition to a low-carbon, climate resilient and environmentally sustainable economy by 2050. The aim of adaptation is to reduce the vulnerability of our environment, society and economy and increase resilience. Adaptation also brings opportunity through green growth, innovation, jobs and ecosystem enhancement as well as improvements in areas such as water and air quality. Key actions under the framework: • Putting in place revised governance and reporting arrangements	The Policy is within the SPPS for NI and will therefore not affect or be affected by the Framework.

	• Formalising the status of existing guidelines • Formalising long term operational support for key sectors • Facilitating the establishment of regional local authority climate action offices • Increasing awareness around climate adaptation and resilience Integrating climate adaptation into key national plans and policies	
DCCAE (2021) National Climate Action Plan	This plan is the Irish Governments Climate Action Plan which is committed to achieving a net zero carbon energy systems objective for Irish society and in the process, create a resilient, vibrant and sustainable country. The Government will take the lead on this agenda through this Plan in defining a roadmap to this goal and initiating a coherent set of policy actions to get us there. The plan highlights a number of actions relating to targets, governance, carbon pricing, electricity, enterprise, built environment, transport, agriculture, waste, public sector, international action, citizen engagement, and adaptation.	The Policy is within the SPPS for NI and will therefore not affect or be affected by the Plan. Although it will facilitate the sitting of Renewable energy developments in line with the Plans commitment to net zero.
Government of Ireland (2018) Project Ireland 2040: National Development Plan 2021-2030	The National Development Plan (NDP) sets out the investment priorities that will underpin the successful implementation of the new National Planning Framework (NPF). The objectives of the National Development Plan match those of the NPF. A fundamental underlying objective of the NDP is, therefore, to focus on continued investment to yield a public infrastructure that facilitates priorities such as high-speed broadband and public transport in better cities and in better communities. The public goods generated through investment in physical infrastructure will be critical to strengthening Ireland's human capital and to fostering the development of clusters in important growth areas in order to attract new investment.	The Policy will facilitate renewable energy infrastructure in NI which is unlikely to impact Ireland directly in terms of the NDP. Delivery of renewable energy in NI may benefit Ireland if energy generated was supplied across the border.
National planning Framework (Ireland)	The National Planning Framework and the National Development Plan 2021-2030 combine to form Project Ireland 2040. The NPF sets the vision and strategy for the development of the country to 2040 and the NDP provides the enabling investment to implement that strategy.	It is not anticipated that the Policy will affect or be affected by the NPF in Ireland as the Policy sits within the SPPS for NI.

APPENDIX B: ENVIRONMENTAL BASELINE MAPS



Map data © OpenStreetMap contributors, Microsoft, Esri Community Maps contributors, MapLayer by Esri, Esri, CGIAR, USGS, Esri UK, Esri, HERE, Garmin, FAO, METI/NASA, USGS, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.



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00	20/04/2022	First Draft	CW	PG	PG

Renewable and low carbon energy SEA

RSK

TITLE: Figure 2:
National Designations- Nature Conservation Sites

ID:663592 - CW_Figure 2 National Designations

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Kilometres

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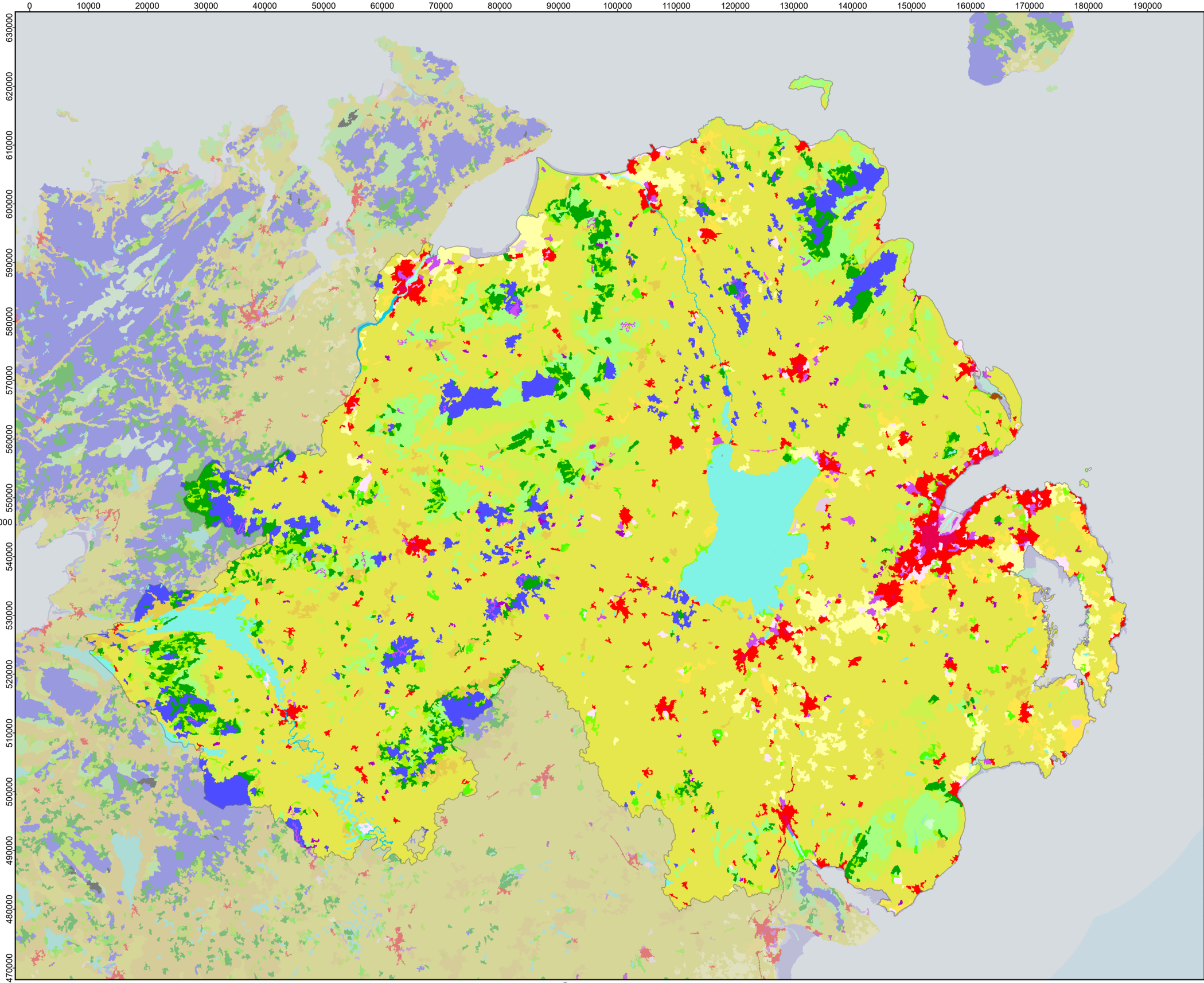
Path: P:\EIA\660000 - EPD National\663592 - Renewable and low carbon energy SEA\01-GIS\663592 - CW.aprx\Figure 2 National Designations



Legend:

Corine Land Cover 2018 raster

- Continuous urban fabric
- Discontinuous urban fabric
- Industrial or commercial units
- Road and rail networks and associated land
- Port areas
- Airports
- Mineral extraction sites
- Dump sites
- Construction sites
- Green urban areas
- Sport and leisure facilities
- Non-irrigated arable land
- Fruit trees and berry plantations
- Pastures
- Complex cultivation patterns
- Land principally occupied by agriculture, with significant areas of natural vegetation
- Broad-leaved forest
- Coniferous forest
- Mixed forest
- Natural grasslands
- Moors and heathland
- Transitional woodland-shrub
- Beaches, dunes, sands
- Bare rocks
- Sparsely vegetated areas
- Burnt areas
- Inland marshes
- Peat bogs
- Salt marshes
- Intertidal flats
- Water courses
- Water bodies
- Estuaries
- Sea and ocean

Coordinate System: TM65 Irish Grid
Projection: Transverse Mercator
Datum: TM65
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	20/04/2022	First Draft	CW	PG	PG

Renewable and low carbon energy SEA

RSK

TITLE: Figure 3: Habitat Types (Corine Land Cover 2018 raster)

ID:663592 - CW_Figure 3 Land Cover Map

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Kilometres

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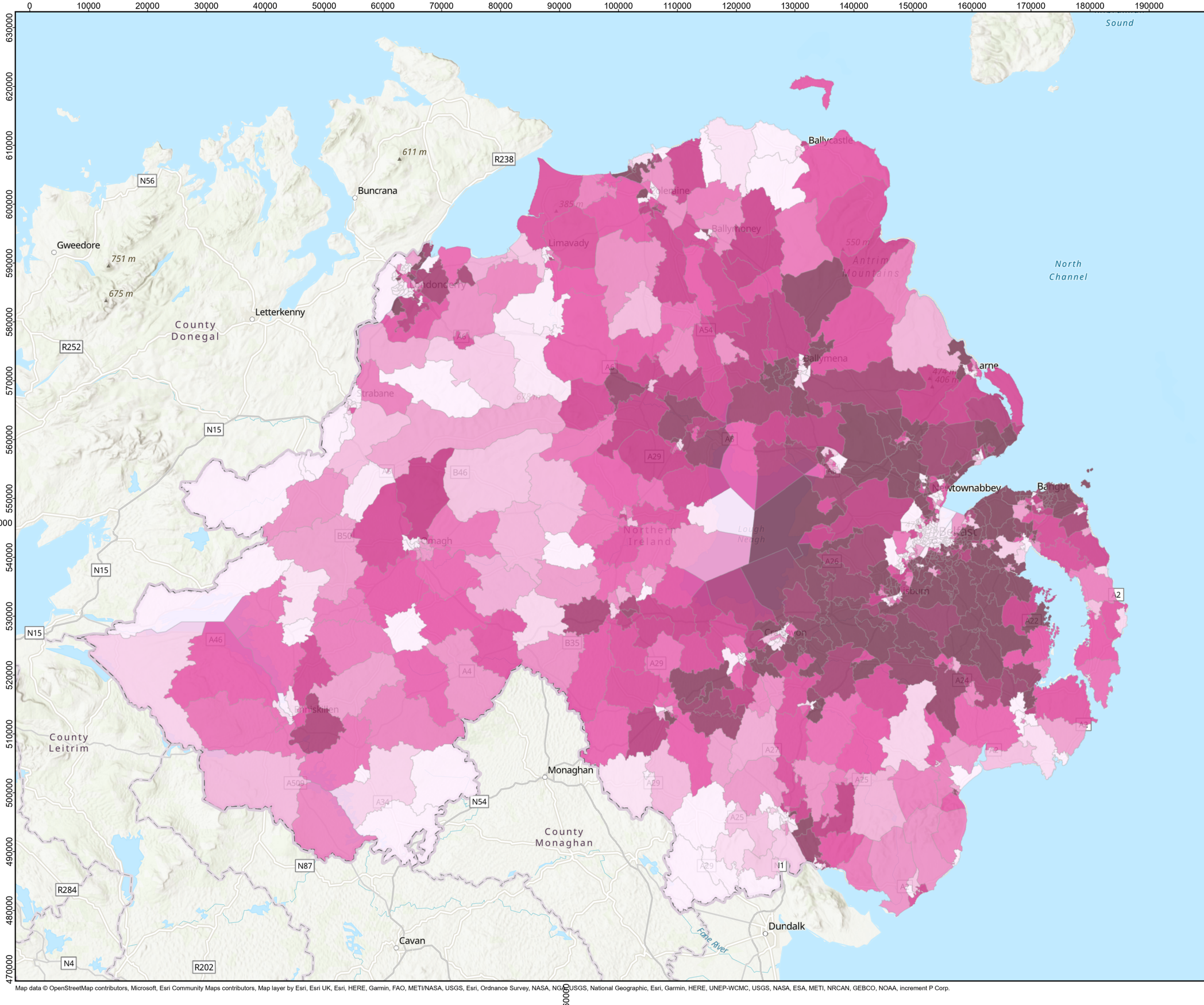
Path: P:\EIA\660000 - EPD National\663592 - Renewable and low carbon energy SEA\01-GIS\663592 - CW.aprx\Figure 3 Land Cover Map



Map data © OpenStreetMap contributors, Microsoft, Esri Community Maps contributors, Map layer by Esri, Esri UK, Esri, HERE, Garmin, FAO, METI/NASA, USGS, Esri, Ordnance Survey, NASA, NGA, USGS, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Legend:

Multiple Deprivation Measure (NI) 2021 Ranking
(by Super Output Area)

Most deprived

Least deprived

Notes:
1. NI data based on Northern Ireland Multiple Deprivation Measure 2021 data (most to least deprived areas by decile) for Super Output Areas.
2. Data should be used for illustrative purposes only.

Coordinate System: TM65 Irish Grid
Projection: Transverse Mercator
Datum: TM65
Units: Meter

Rev	Date	Description	Drn	Chk	App
01	22/04/2022	Notes Added	CW	PG	PG
00	22/04/2022	First Draft	CW	PG	PG

Renewable and low carbon energy SEA

RSK

TITLE: Figure 4: Overall Deprivation Rankings for Northern Ireland

ID:663592 - CW_Figure 4 Deprivation Rankings

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Scale: 1:600,000 @ A3

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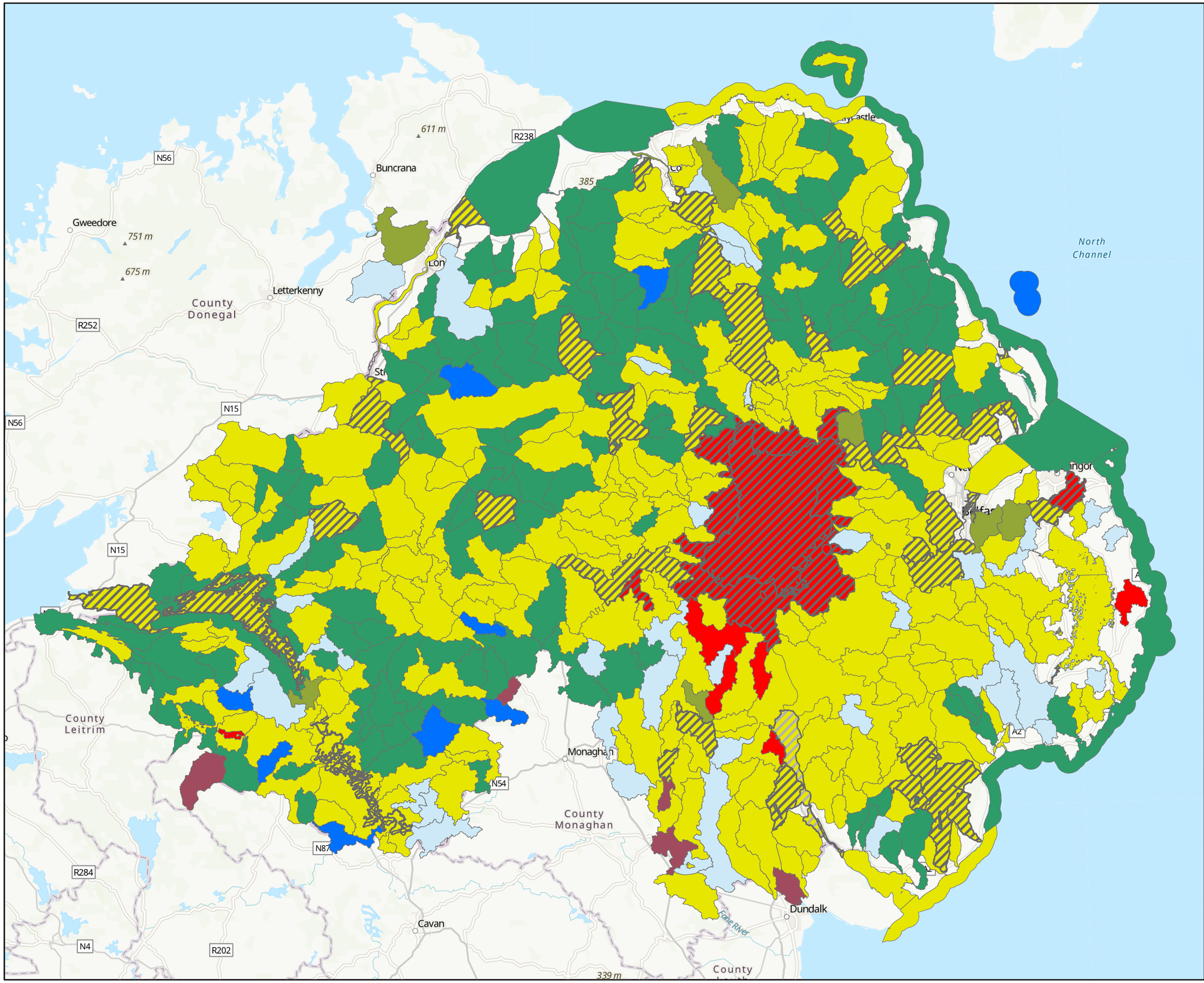
Path: P:\EIA\660000 - EPD National\663592 - Renewable and low carbon energy SEA\01-GIS\663592 - CW.aprx\Figure 4 Deprivation Rankings



Legend:

Surface Water Body Satus

- High
- Good
- Moderate
- Poor
- Bad
- Good Ecological Potential
- Moderate Ecological Potential
- Moderate Ecological Potential (Artificial Water Bodies)
- Poor Ecological Potential
- Bad Ecological Potential
- No Data

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

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01	22/04/2022	Legend Changes	TM	PG	PG
00	22/04/2022	First Draft	TM	PG	PG

Renewable and low carbon energy SEA

RSK

TITLE: Figure 5 - Water Quality Status Map

ID:663592_Figure 5 - Water Quality Map

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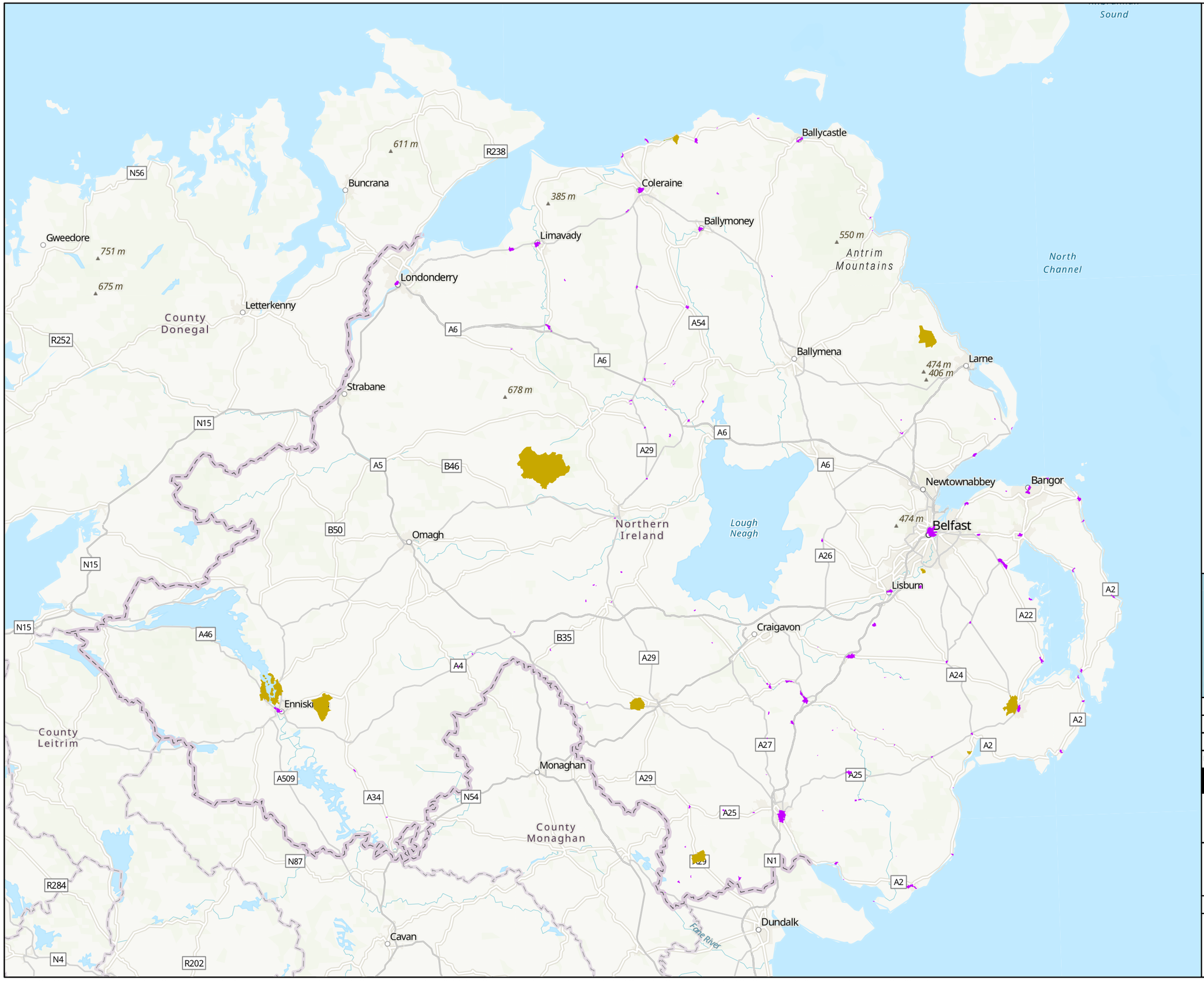

Legend:

- Areas of Significant Archeological Interest
- Areas of Archealogical Potential

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

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Renewable and low carbon energy SEA

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TITLE: Figure 6 - Areas of significant archaeological interest and areas of archaeological potential

ID:663592_Areas of Significant archaeological interest and areas of archaeological potential

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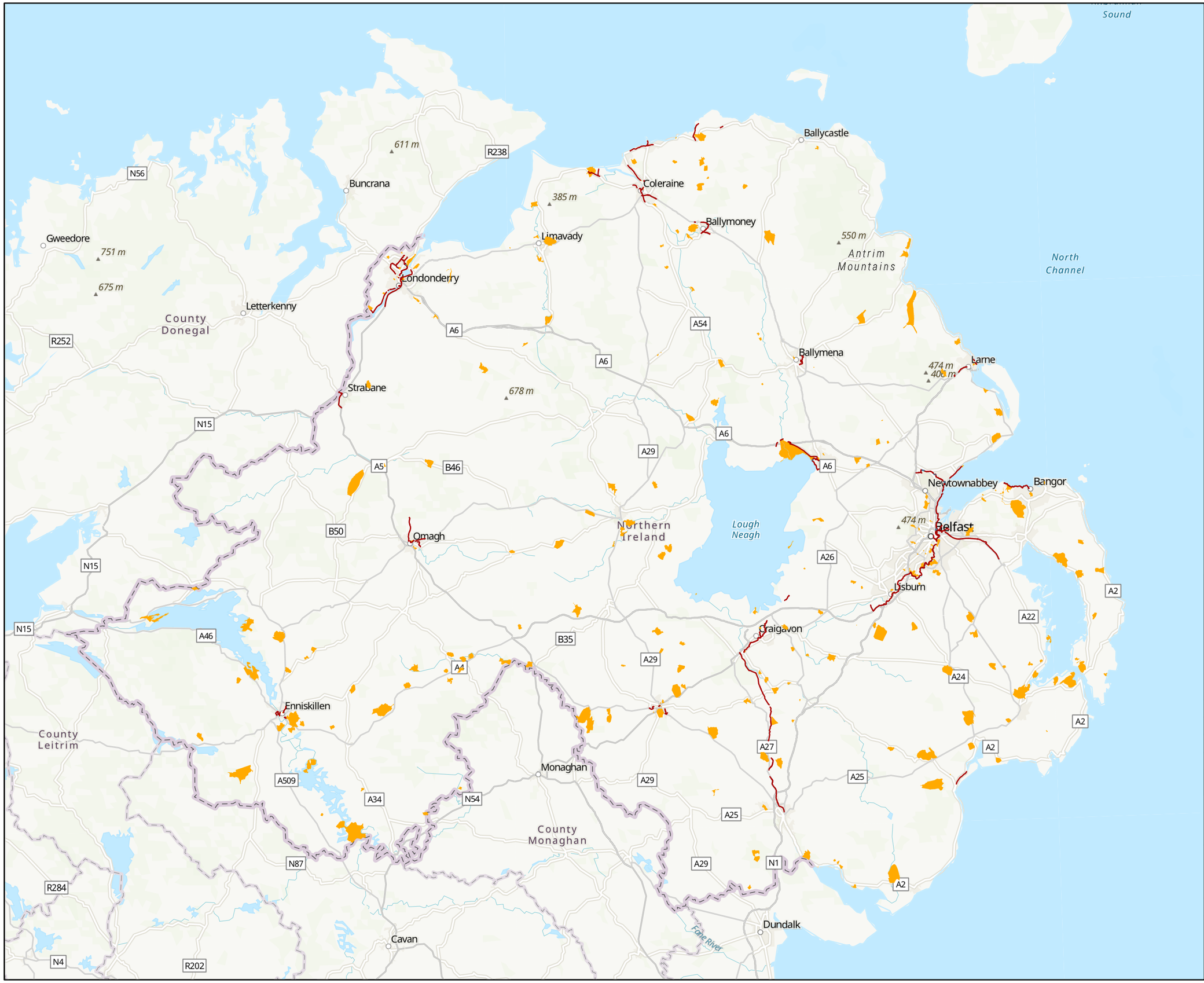

Legend:

- Historic Parks and Gardens

National Cycle Routes

- On Road
- Traffic Free

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
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Renewable and low carbon energy SEA

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TITLE: Figure 7: Access and Sustainable Transport

ID:663592_Access and Sustainable Transport

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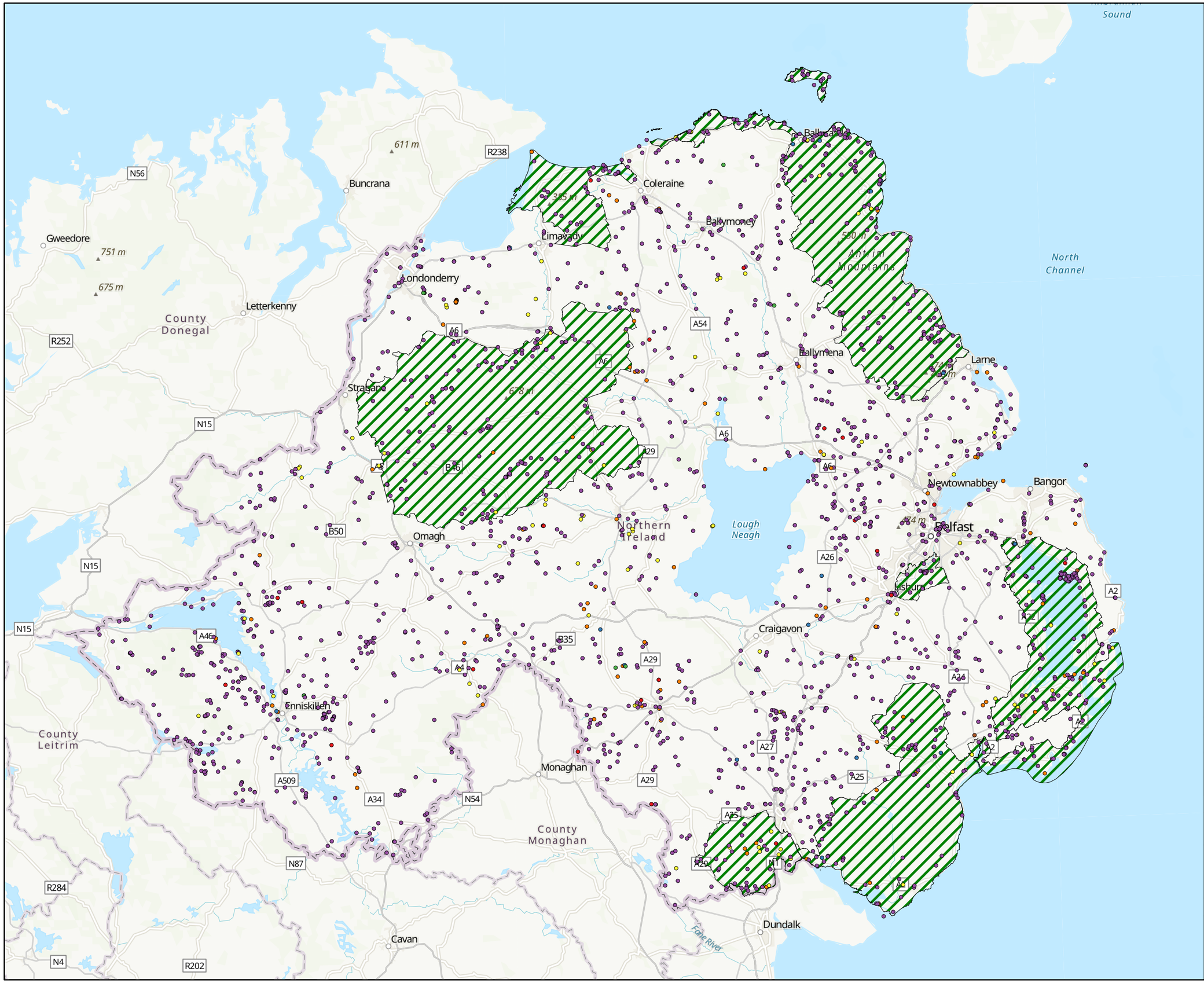

Legend:

Northern Ireland Sites and Monuments Record

- Descheduled
- Listed
- Proposed for Scheduling
- Scheduled
- State Care
- State Care and Scheduled
- State Care with Proposed Scheduled Area
- AONB

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

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00	22/04/2022	First Draft	TM	PG	PG

Renewable and low carbon energy SEA

RSK

TITLE: Figure 8 - Access and Sustainable Transport

ID:663592_Statutory Designations - Landscape & Cultural Heritage Sites

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